ICPEU 3 2017

3rd International Conference

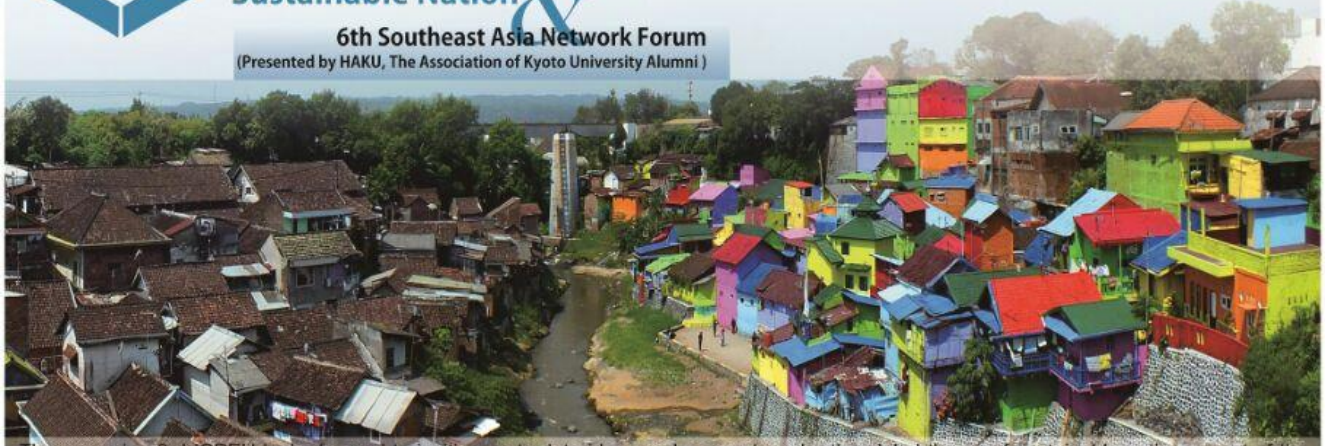
Planning in the Era of Uncertainty

Sustainable Nation &

6th Southeast Asia Network Forum

(Presented by HAKU, The Association of Kyoto University Alumni)

6-7 March 2017



The upcoming 3rd ICPEU looks forward to inviting up-to-date ideas and research under the global theme of sustainable nation; a part of the internationally acknowledged concept of sustainable development. With the hope to participate in this global movement, the international conference will cover a wide range of themes in the field of Urban Studies, Environment, Infrastructure, Information System (EIIS), and Regional Planning and Public Policy.

THEME

1. URBAN STUDIES
   a. Creative Urban Design
   b. Integrated Land Use Management
   c. Settlement Planning and Management
   d. Spatial Behaviour
   e. Urban Management
   f. Remote Sensing for Planning
   g. Urban Conservations
2. ENVIRONMENT INFRASTRUCTURE AND INFORMATION SYSTEM (EIIS)
   a. Sustainable Transportation
   b. Energy Issues in Spatial Planning
   c. Environment Management
   d. ICT in Planning
   e. Sustainable Infrastructure
   f. Climate Change
3. REGIONAL PLANNING AND PUBLIC POLICY
   a. Ecotourism
   b. Rural Initiative
   c. Poverty, Management Conflict, and Public Policy
   d. Disaster Management
   e. Social Capital
   f. Coastal Management
   g. Community Development

KEYNOTE SPEAKERS

Prof. KIYOSHI KOBAYASHI
Kyoto University
Professor of Engineering, Infrastructure Economics, and Management

Prof. HANS WESTLUND
Kungliga Tekniska Hogskolan
Professor in Regional Planning
Stockholm, Sweden

Dr. Ir. SURJONO, MTP
Universitas Brawijaya
Associated Professor in Urban and Regional Planning

Dr (HC) Ir. TRI RISMAHARINI, M.T
Mayor of Surabaya

Prof. MASAAKI OKAMOTO
Kyoto University
Professor in Political Science

CALL FOR PAPERS

Prospective authors are kindly invited to submit their extended abstract. Articles submitted should meet the theme, "Sustainable Nation" and address to one or more specific topics. Files should be submitted via website to icpeu.ub.ac.id
Only english-edited papers will be reviewed and selected authors should keep in accordance with further guidelines for inclusion in conference proceedings.

IMPORTANT DATES

	Early Bird	Normal
Deadline for Extended Abstract	= December 5th, 2016	January 4th, 2016
Announcement of Acceptance Abstract	= December 9th, 2016	January 11th, 2016
Deadline for Selected Abstract Payment	= December 16th, 2016	January 18th, 2017
Final Submission for Full Paper	= Ferbuary 10th, 2017	Ferbuary 10th, 2017
Conference Day	= March 6th-7th, 2017	March 6th-7th, 2017

*Submitted paper will be carefully reviewed, accepted, and revised registered papers will be published into Conference Proceeding. Highly selected papers will be published into International Journal of Sustainable Development Indexed By Scopus, or accredited National Journals The Socio-Economic Infrastructure Journal. Accreditation: 690/AU2/P2MI-LIPI/07/2015

Registration Deadline	Early Bird	Normal
Authors	December 11th-25th, 2016	December 26th, 2016 - March 3rd, 2017
Participant	September 1st- December 25th, 2016	December 26th, 2016 - March 3rd, 2017

CONFERENCE FEE

	Early Bird	Normal
Presenter *	IDR 1.250.000 / 150 USD	IDR 1.500.000 / 200 USD
Participant	IDR 500.000 / 75 USD	IDR 600.000 / 125 USD
Local Student	IDR 250.000	IDR 350.000

*Indexed publication fee is excluded

FACILITIES

Certificate and Seminar Kit
Proceeding Files
Extended Abstract Files
Coffee Break and Lunch
Journal TAKODA

BANK DETAILS

for transfer or payment:
BANK MANDIRI
Branch : University of Brawijaya
Account Number : 144-00-1482522-5
Account Name : WAWARGITA PERMATA WIJAYANTI
Swift Code : BMRIIDJA

FIELD TRIP

Visit to Bromo-Tengger-Semeru National Park including Mt. Bromo's crater and the Sand sea
IDR 500.000 / 60 USD

VENUE

WIDYALOKA BUILDING
University of Brawijaya
Jl. Veteran
Malang, Indonesia

FURTHER INFORMATION

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3rd ICPEU 2017
3rdICPEU2017

Book of Program

3rd International Conference Planning In The Era of Uncertainty

Sustainable Nation

Preface: The 3rd International Conference in The Era of Uncertainty: Sustainable Nation

Sustainable development is gaining more popularity in the domain of Urban and Regional Planning. The United Nations proposed a set of goals, namely Sustainable Development Goals (SDGs) as a continuation of the previous declaration, the Millennium Development Goals (MDGs). International leaders have agreed to continue the global movement in order to maintain all achieved results and also to complete the purposes of global development that need to be achieved. While there are many issues that needed to be solved and the purposes that need to be achieved. The main achievement in sustainable development today is how to face trade-off between the economic development and environmental sustainability, while at the same time not compromising the social development.

Building upon the issue, "the International Conference in The Era of Uncertainty: Sustainable Nation": is held to harmonize contextual perspective associated with the innovation and creativity that still considers the economic, ecology, and social value in order to create sustainable nations. Sustainable nation requires recommendations and synchronization from stakeholders i.e academics, private sectors as well as governments in order to create an inclusive, comfortable and sustainable place for living.

We would like to thank all authors and participants of the 3rd ICPEU 2017; Faculty of Engineering, Universitas Brawijaya, alumni of Urban and Regional Planning and our sponsorship partners. We also would like to express our highest appreciation to Prof. Kiyoshi Kobayashi of Kyoto University, Prof. Hans Westlund of Kungliga Tekniska Hogskolan (KTH) Royal Institute of Technology Sweden, Dr. Ir Surjono, MTP of Universitas Brawijaya, Dr (HC) Ir. Tri Rismaharini (Mayor of Surabaya), M.T., Prof. Masaaki Okamoto of Kyoto University, Oda Masaharu of Kyoto University, and Dr. Emil Elestianto Dardak, M.Sc (Mayor of Trenggalek) for their participations as keynote speakers in the conference.

THE COMMITTEE OF 3rd ICPEU 2017

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3rd ICPEU 2017 PROGRAM
Monday, 6th March, 2017

Time	Agenda	Remarks
07.30-09.00	Registration	
09.00-10.00	**OPENING SESSION:**	
	Art Performance (Topeng Dance)	
	Opening	
	Pray	
	National Anthem "Indonesia Raya"	PSM Teknik
	Welcoming speech from Head of Urban and Regional Planning Department	Dr. Ir. Abdul Wahid Hasyim MSP.
	Welcoming Speech from Dean of Engineering Faculty	Dr. Ir. Pitojo Tri Juwono, MT.
	Opening Speech from Rector of University of Brawijaya	Prof. Dr. Ir. Mohammad Bisri, M.S.
	Photo Session	
	Coffee break	Committee
10-30-13.30	**PLENARY SESSION 1:**	Moderator: Ir. Ismu Rini Dwi Ari, MT., Ph.D
	Keynote speech 1	Keynote Speaker: DR. (HC) Ir. Tri Rismaharini MT.
	Keynote Speech 2 "Evacuation Orders and Unforeseen Risks in Volcanic Disasters"	Keynote Speaker: Prof. Kiyoshi Kobayashi
	Keynote speech 3 "Urban Rural Relations in The Post-Urban World"	Keynote Speaker: Prof. Hans Westlund
	Discussion	
	Delivery of Keynote Speakers and Moderator Certificate	
13.30-14.30	Lunch Break and Dzuhur praying	
14.30-17.10	**PARALLEL SESSION I**	
15.30-16.00	Coffee Break	
17.00-17.10	Closing By Moderator in Each Class	

3rd ICPEU 2017 PROGRAM
Tuesday, 7th March, 2017

Time	Agenda	Remarks
07.30-09.00	Registration and coffee break	
09.00-09.15	Opening	
	Art Perfomance: Saman Dance	
09.15-12.40	**PLENARY SESSION 2**	**Moderator:** **Dadang Meru Utomo, ST., MURP.**
	Keynote Speech 4	Keynote Speaker: Dr. Emil Elestianto Dardak M.Sc
	Keynote Speech 5 "Politics of ICT in Southeast Asia"	Keynote Speaker: Prof. Masaaki Okamoto
	Keynote Speech 6 "Kyoto University Program for ASEAN"	Keynote speaker: Oda Masaharu
	Keynote Speech 7 "Lessons Learnt from and Sustainability Assessment of Indonesian Urban Kampung"	Keynote Speaker: Dr. Ir. Surjono MTP.
	Discussion	
	Delivery of Keynote Speaker and moderator's Certificate	
12.40-13.40	Lunch break and dzuhur praying	
13.40-14.40	**PARALLEL SESSION II**	
15.10-15.30	Coffee Break	
15.30-16.20	**CLOSING CEREMONY**	
	Opening closing ceremony	
	Art Performance: Contemporary Dance	
	Announcement of Best Presenter	
	Art Performance: Keroncong	
	Closing Speech By Conference Coordinator	Aris Subagiyo ST., MT.
00.00-end	Field Trip To Bromo	

PARALLEL SESSION A (ENVIRONMENT, INFASTRUCTURE, AND INFORMATION SYSTEM) SCHEDULE
(Monday, 6th March 2017)

Time	Author	Moderator
14.30-15.00	Baiq Harly W. "Effectiveness of Waste Management in Mataram City"	Dr. techn. Christia Meidiana, ST., M.Eng
	Erwin Bahar "Sustainability Study of Domestic Wastewater Treatment Communal in Surabaya City"	
	Naema Siahaan "SWOT Analysis: Water Hyacinth Management Plan at Lake Toba, Samosir Regency"	
15.00-15.30	Sri Sulistyowati "Enhancing Environmental Management Through FSC Certification in Perum Perhutani KPH Kendal"	
	Syauqi Asyraf Faiz "Rice Production Model Based on the Concept of Ecological Footprint"	
	Alexander Melat Aryasa "The Study of Environmental Carrying Capacity for Sustainable Tourism in Telaga Warna Telaga Pengilon Nature Park, Dieng Plateu, Central Java"	
16.00-16.30	Cita Adiningrum "Reliability Analysis for Determining Performance of Barrage based on Gates Operation"	
	Destha Aji Kesuma "Factor Weighting in DRASTIC Modeling to Evaluate Aquifer Vulnerability in Salatiga Groundwater Basin, Central Java Province"	
	Elia Sawitri "The Difference in the Level of CO2 Emission from The Transport Sector on Weekdays and Weekends on The City Center of Pemalang"	
16.30-17.00	Muchsin Nur Wachid "Mangrove Canopy Density Analysis using Sentinel-2A Imagery Satellite Data"	
	Haryono Huboyo "Potential Air Pollutant Emission From Private Vehicles Based on Vehicle Route"	
	Syahri Ramadhan Ahmad "Assessment of Environmental Carrying Capacity Tambaklekok Village"	

PARALLEL SESSION B (ENVIRONMENT, INFASTRUCTURE, AND INFORMATION SYSTEM) SCHEDULE
(Monday, 6th March 2017)

Time	Author	Moderator
14.30-15.00	Agista Aristia "Identification Open Space Publik based on Children Perception (Case Study: Alun-Alun Merdeka Malang)"	Imma Widyawati Agustin, ST., MT., Ph.D
	Tomi Eriawan "Characteristics Utilization of Public Space in Padang City Based on Good Public Space Index"	
	Rizal Priadaniswari The Perception of Visitors towards The Level of Satisfaction on Park (Case Study: Singha Merjosari Park Malang)	
15.00-15.30	Dwi Prio Soetrisno "The Relationship Between The Availability Of The Supporting Elements Of The Pedestrian With Pedestrian Crossing Facility Usage Based On User Preferences (Case Study Corridor of Sumbersari Street, Gajayana Street, MT. Haryono Street, Malang City)"	
	Mutiasari Kurnia Devi "Potential to Increase Active Commuting Level in University Area (Case Study: Universitas Gadjah Mada)"	
	Verenita Bella Cosalia "Pedestrian Visual Recommendation in Kertanegara - Semeru Corridor"	
16.00-16.30	Dhea Permatasari "Customer Satisfaction Against The Quality of The Railway Services Tawang Alun Malang-Banyuwangi"	
	Muhammad Syahbandi "The Modal Transfer Analysis by Adding Transport Costs Case Study: The Use of Bus and Vehicle Private Student Institute of Technology Sumatera"	
	Rahmat Muallim "Green Sustainable Transportation Mode into Manage Natural Resources Infrastructure Plan on Sulawesi Rail Road Project Case study: Makassar – Pare-Pare Rail Road Project of South Sulawesi Indonesia"	
16.30-17.00	Muhammad Ridha Kasim "The Integration level of Public Transportation in Makassar City"	
	Leonardus F. Dhari "The Servition of Dokar Transportation in Supporting Tourism in Kota Batu"	
	Dedi M. Buamona "Publik Perception against the mode of transportation based online (G0-jek) in Malang"	

PARALLEL SESSION C (REGIONAL PLANNING AND PUBLIC POLICY) SCHEDULE

(Monday, 6th March 2017)

Time	Author	Moderator
14.30-15.00	Catharina Dwi Astuti Depari "Sustainability and Vulnerability: Understanding the Anomaly from Disaster Perspectives Case Study: Glagaharjo Village in Mount Merapi"	Dr. Eng Turningtyas Ayu R, ST., MT.
	Dwi Rahmawati "Disaster Risk Mapping of Kelud Eruption, Case Study: Kasembon, Malang Regency"	
	Lusi Utama "Mitigasi Disaster at Drainage Basin of Kuranji Padang City"	
15.00-15.30	Aria Mariany "The Integration of Disaster Risk Analysis into Spatial Planning In Indonesia: A Review from Indonesia Practice"	
	Jili Anggraita Sari "Traveller Preparedness in Disaster-Prone Tourist Sites"	
	Maya Damayanti "Infrastructure as a Shared Resource of Tourist and Non-Tourist Activities in a Disaster Prone Area"	
16.00-16.30	Artiningsih "Building Transformative Adaptation: Comparing Pekalongan Municipal Government's and Community's Initiatives on Minimizing The Risk of Coastal Inundation"	
	Rozina Khanam "Community-Based Livelihood Management in Relations to Natural Disaster–A Study on Teknaf (coastal) area of Bangladesh"	
	Sariffuddin "The Role Local Initiatives in Community Based Disaster Risk Management in Kemijen, Semarang City"	
16.30-17.00	Nimas Maninggar "Innovation System and Regional Development: The role of Inter-actor Collaboration in creating low tech Industrial Innovation"	
	Amalia Sharfina Sarnyoto "Planning of Dairy Farm and Dairy Plant Based on Ecotourism"	
	M. Riza Ali Muzaqqi "Assessment of Land Allotment Support Power Industry In Grati, Pasuruan Regency"	

PARALLEL SESSION D (REGIONAL PLANNING AND PUBLIC POLICY) SCHEDULE

(Monday, 6th March 2017)

Time	Author	Moderator
14.30-15.00	Ayunda Gading Mahayu "Perception Study About Visitors Related To Development Of Rowo Bayu Attractions in Kecamatan Songgon Banyuwangi"	Gunawan Prayitno, SP., MT., Ph.D
	I Nyoman Sudiarta "Bali as Ecotourism Destination: Alternative Strategy in Marketing of Tourism Destination"	
	Retnayu Prasetyanti "Channeling City Development to Pro-Poor Tourism (PPT) in Indonesia: Experiencing Slum Kampong-Tour Development from Malang (East Java) to Jakarta"	
15.00-15.30	Indhar Wahyu Wiraharjo "Scaling Up Social Capital: A Model of Rural Community Empowerment"	
	Resmi Amalia "Study of Government Policy to Improve Rural Infrastructure Development"	
	Bayu Purnomo "Analysis of Perception and Community Participation in Forest Management at KPHP Model Unit VII-Hulu Sarolangun, Jambi Province"	
16.00-16.30	Annisa Nurul Hakim "Measuring the Community Satisfaction Index of Population and Civil Registration in Malang Municipal"	
	Baiq Ismi Rakhmah "The Analysis of Occupant Satisfaction on Service Quality of the Manager (Official-Based Technical Managing Unit) of Mandalika Public Mansion in Mataram City"	
	Fadhilatus Shoimah "Development Strategy of SME Sectors Case Study: South Hulu Sungai Regency, South Borneo Province"	
16.30-17.00	Putu Giana Eka Suardi "Spatial Potential Analysis of Coconut Farm as A New Ecotourism Attraction in Subagan Village Using GIS"	
	Putri Mulyo Mawarsari "Minapolitan Region Development Analysis at Penajam Paser Utara using Blue Economy Concept"	

PARALLEL SESSION A (URBAN STUDIES) SCHEDULE
(Tuesday, 7th March 2017)

Time	Author	Moderator
13.40-14.10	Akbar Muammar Syarif "Cellular Automata Algorithm for Spatial Modeling of Urban Physical Development in Dubai, United Arab Emirates"	Chairul Maulidi, ST., MT.
	Erie Sadewo "The Centrifugal and Centripetal Force Influence on Spatial Competition of Agricultural Land in Bandung Metropolitan Area"	
	M. Fahmiriyan Nur Arifin "Determination Of Alternative Incentives And Disincentives In The Utilization Of Space At Priority Areas – Case Study: Village Tunggulwulung & Tasikmadu Malang"	
14.10-14.40	Gloria Andida Cahya "Malioboro as Value of Special District of Yogyakarta City"	
	Hafiz Firjatullah "Wayfinding Concept in University of Brawijaya"	
	Wahyu Ramadhan "Patterns of Social Networks Senior High Students (SMA Negeri 8 Malang) in the selection Mode"	
14.40-15.10	Isma Adila "Disaster Mitigation Action Plan: Digital Media on Improving Accountability and Mending Community Relationships"	
	Viesda Desi Pithaloka "Collaborating Privates and Communities as Place Making Tactical Strategy: A Case Study of Public Space in Bandung"	

PARALLEL SESSION B (URBAN STUDIES) SCHEDULE
(Tuesday, 7th March 2017)

Time	Author	Moderator
13.40-14.10	Harfa Iskandaria "Human Settlement Improvements In Kota Tua With Green And Clean Approach"	Wulan Dwi Purnamasari, ST., MT.
	Prilly Esterina D. Saudale "Handling Priority Regions and Colonial Buildings of Malang (Case Study : Klojen)"	
	Ummu sahdiah sahlan "Influence Of Baubau City's Development To The Image Of Buton Palace Fortress"	
14.10-14.40	Zya Dyena Meutia "Built Urban Heritage Conservation in Islamic Communities: Study Case in Banda Aceh, Indonesia"	
	Oktavia Altika Dewi "The Approach Methods of Visual Absorption Capability For Conservation Ancient Buildings Area In Pasuruan City"	

PARALLEL SESSION C (URBAN STUDIES) SCHEDULE
(Tuesday, 7th March 2017)

Time	Author	Moderator
13.40-14.10	Novi Maulida Ni'mah "Urban Greenspace for Resilient City in the Future: Case Study of Yogyakarta City"	Dr.Eng I Nyoman Suluh Wijaya, ST., MT.
	Yan Akhbar Pamungkas "City Prosperity Index of Malang City"	
	Yunita Arafah "Re-defining Smart City Concept in The Uncertainty Era with Resillience Approach"	
14.10-14.40	Ir. Miming Miharja, Msc. Eng., PhD "Urban Development Control Based on Transportation Carrying Capacity"	
	Sri Tuntung Pandangwati "Bus network redesign for inner southeast suburbs of Melbourne, Australia"	
	Supriatna Adhisuwignjo "Development of A Solar-Powered Electric Bicycle In Bikesharing Transportation System"	
14.40-15.10	Ima Rahmawati Sushanti "Implications of Craft Industry Cluster Pearl, Gold, Silver (PGS) Towards Settlements Region in Karang Pule Village, Sekarbela District of Mataram City"	
	Sharina Farihah Hasan "Remittances and Expenditures of Foreign Labours In The Malaysian Construction Industry"	
	AR Rohman Taufiq Hidayat "Creative Industry in Supporting Economy Growth in Indonesia: Perspective of Regional Innovation System"	

LIST OF KEYNOTE SPEAKERS

No.	Keynote Speaker	Title
1.	DR. (HC) Ir. Tri Rismaharini MT.	***tba**
2.	Prof. Kiyoshi Kobayashi	Evacuation Orders and Unforeseen Risks in Volcanic Disasters
3.	Prof. Hans Westlund	Urban Rural Relations in The Post-Urban World
4.	Dr. Emil Elestianto Dardak M.Sc	***tba**
5.	Prof. Masaaki Okamoto	Politics of ICT in Southeast Asia
6.	Oda Masaharu	Kyoto University Program for ASEAN
7.	Dr. Ir. Surjono MTP.	Lessons Learnt from and Sustainability Assessment of Indonesian Urban Kampung

LIST OF EXTENDED ABSTRACTS

Environment, Infastructure, and Information System

LIST OF EXTENDED ABSTRACTS

Regional Planning and Public Policy

LIST OF EXTENDED ABSTRACTS

Urban Studies

Part 1

Environment, Infrastructure, and Information System

Identification Open Space Publik based on Children Perception (Case Study: Alun-Alun Merdeka Malang)

Agista Aristia[a]*, Di Intacano Septian[b]

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Abstract

City will continue to evolve in accordance with the development of the socio-cultural, economic and political behind it. In Indonesia, many found in various forms and functions of public open space. Particularly on the Java Island, the public space owned one of which is the Alun-alun. Alun-alun is a large field where in a square shaped edge has a place of worship and the residence of the local authorities on the other. Public space is personalspace and collective that can be used as space of socialization, play facilities, and expression of talent for children (Maghpur, 2010). The availability of open space that can be used children's play and activity are fundamental rights of children which must be met. From the playground, children learn spontaneity, studying the interaction and socializing with their environment and learn discipline and develop his personality as a whole. To realize all of that, of course, needed a play room spacious, secure and conducive. The play room is a place where children grow and develop intelligence. The formulation of this study was based on the lack of public open space that is individualized for children. So selected the Alun-alun Merdeka Malang as study sites to determine the comfort level square is independent of the perception of children. And to find out how the children's perception, used analysis of IPA (Importance Performance Analysis) as a data processing tool.

Keywords: City; Public Space; Leisure

1. Introduction

The public spaces are empty spaces (Open Space) is very useful, with empty space can contain a variety of activities therein. The public rooms were formerly used in conjunction with a variety of activities both in the form of commercial activities and non-commercial activities (Danisworo, 1991) [1] , are now separated by function respectively. Over time the need for public space itself is very diverse. The needs of this demanding function of open space open space itself, one of the public open space. The function of public open space is as the center of interaction and communication society, as open spaces that accommodate a corridors road that leads towards the public space, and as a city lung – pulmonary increasingly compact (Dharmawan, 2003) [2].

In Indonesia, many found in various forms and functions of public open space. Particularly on the island of Java, the public space owned one of which is the Alun-alun. Alun-alun is a large field where in a square shaped edge has a place of worship and the residence of the local authorities on the other. The public spaces are highly needed by the wider community with different levels of social, economic, ethnic, educational level, differences in age, and the level of motivation or other purposes that do various activities comfortably. To make it happen, then the formation of a public space need to consider the main criteria of a public space (Dharmawan, 2003) [2]. Public space is a physical environment that is part of the way to provide a stimulus for the development of children. This is because many of the children require that motoric movement freely. Public space is personalspace and collective that can be used as space of socialization, play facilities, and expression of talent for children (Maghpur, 2010) [3]. The availability of open space that can be used children's play and activity are fundamental rights of children which must be met. From the playground, children learn spontaneity, studying the interaction and socializing with their environment and learn discipline and develop his personality as a whole. To realize all of that, of course, needed a play room spacious, secure and conducive. The play room is a place where children grow and develop intelligence (Syahrul, 2013) [5]. Then that's where they make contact with the environment and processes as well as their peers.

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As one of the cities in Java, Malang has a Alun-alun, one is the square of independence. Alun-alun Merdeka its surroundings has been around since 1882, now Alun-alun Merdeka serves as a central park for the city of Malang that accommodates a wide range of activities of people like to sit, relax, play and the other social activities. Alun -alun

Merdeka Malang is located in the center of the CBD (Central Bussines District) this certainly will greatly affect children in a public open space, such as: noise, aromas and smell, as well as other factors that can trigger the declining convenience Alun-alun Merdeka. For it required study of the performance of the convenience of the public open space in order to maintain the existence of the Independent square as central park in accommodating hosts social activities that include a lot of people with a variety of characters and behavior. The purpose of doing research is to know the level of comfort of the public open space based on the perception of the child. This research will be the tool for measuring the level of comfort is based on the perceptions of children in public open Spaces in the city of Malang in this research is the square of independence. The perception of comfort the child towards Independence Alun-alun Malang as public open space based on factor-factors affecting the comfort of public open spaces

2. Methods

The research method in this study using descriptive research method, which in this study what their problems investigated in accordance with the purpose to describe the characteristics / object appropriately. Has first to the method of this study is data collection, carried out by means of interviews and questionnaires, and the second is to analyze the data by using IPA (Importance Performance Analysis) to obtain the level of satisfaction and interest as well as the position of each variable in the quadrant IPA. The level of satisfaction and comfort that produced a child's comfort. The children in this study is limited by the age of 6-12 years, or in children's development phase is a phase intermediate (middle) and late, comparable to primary school. Children as the object of this study did not include street children, the disabled, or the owner of mental illness

3. Results

Analysis comfort level open space public views on the perception of the child is done with the approach of the IPA (Importance Performance Analysis), the first step is to look for satisfaction and importance of an object based on variables that have been determined by using the technique distribution of the questionnaire as a media crawler visitor perceptions in research applications, visitors will assess the comfort level Alun-alun Merdeka by variable comfort of a public open space. The value of each item is summed and then look for value - average of all existing items. Values between importance and satisfaction transferred to cartesians diagram, which has calculated the average satisfaction and importance.

The level of satisfaction is the result of comparative performance scores with a score of interests. The level of satisfaction is what will determine the order of priority of improving factors that affect customer satisfaction. The equation used is as follows

$$Tki = \frac{Xi}{Yi} \times 100\% \qquad (1)$$

Where:
TKI = level of conformance
XI = Score assessment of customer satisfaction
Yi = Score assessment of customer's interests

Users will be satisfied if an assessment of the quality of public open space (supplies) is proportional to the importance of the expected users (demands), is a value concordance rate of 100%. If the value exceeds 100%, then the user is considered very satisfied, where as if it is below 100% indicates that there are one or several aspects that are considered necessary to be improved so that user satisfaction can be met.

The average score of the performance assessment of these respondents will then be put on a Cartesian diagram with a horizontal axis (x axis) is the average score ratings satisfaction $\overline{(X)}$ $\overline{(X)}$ ofand the vertical axis (y-axis) is the average score ratings interests $\overline{(Y)}\overline{(Y)}$

Cartesians diagram will be divided into four quadrants by the intersection of the axis the average value of the total score ratings satisfaction $\overline{(X)}$ $\overline{(X)}$ of and total votes interests $\overline{(Y)}\overline{(Y)}$ the cumulative by following formula:

$$\overline{(X)} = \frac{\sum X_i}{n} \qquad (2)$$

$$\overline{(Y)} = \frac{\sum Y_i}{n} \quad (3)$$

Where:
n = number of respondents
Then to determine the limits of objectivity in the mapping attribute on the Cartesian diagram, namely point - point $(\overline{X, Y})$ use the formula:

$$X = \frac{\sum_{i=1} X_i}{K} \quad (4)$$

$$Y = \frac{\sum_{i=1} Y_i}{K} \quad (5)$$

Where:
K = the number of items/attributes that are valued users.

Through this method, it will be obtained information items that need improvement based on the scope of the 4 quadrants. As for the quadrant, among others, as follows:

a. Quadrant I "concentrate here":
Having a high score of the level of interest, but scored lower in terms of satisfaction.These results shows the location of discontent visitors. Included in this quadrant must be improved.
b. Quadrant II, "Keep up the good work":
Having a high score both in terms of importance and satisfaction. Aspects in this category an aspect that is ideal, because it shows that public open spaces provide comfort to each variable. Included in this quadrant should be maintained or even further improved by a public open space, because all of these variables makes it a superior room or a place in the eyes of the user.
c. Quadrant III, "low priority":
Good score importance or low satisfaction. Aspects that are included in this group can be ignored because of its effect on the perceived benefits by users is very small.
d. Quadrant IV, "possible overkill":
Score a low interest rate but high satisfaction scores. These results indicate factors that are considered less important by users deemed too excessive, but the perceived level of satisfaction is very high.

4. Conclusion

It is expected that from the analysis of the factors affecting the level of comfort in an open space by the standards of comfort that there can be seen a basic principle of subjective comfort and therefore contributes to a person's perception in interpreting the level of comfort. And to the results of the analysis of the comfort level of public space based on the perception of children, expected result is a comfort level knowing how public space is based on perception of children

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The Study of Environmental Carrying Capacity for Sustainable Tourism in Telaga Warna Telaga Pengilon Nature Park, Dieng Plateu, Central Java

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Abstract

The increasing in quantity of the tourists visiting Telaga Warna Telaga Pengilon Nature Park, Dieng Plateau, Central Java, can cause a potential threat toward the conservation sustainability of the tourist attraction and the surrounding area. The utilization of conservation area for tourist attraction has to be carried out based on the principal of Environmental Carrying Capacity so that it will not affect the ecosystem. This study aims to determine the value of Telaga Warna Telaga Pengilon Nature Park environmental carrying capacity as a conservation area used for tourism activities. The environmental carrying capacities calculated in this study were physical carrying capacity, real carrying capacity, and effective carrying capacity. Results of this research show that the physical carrying capacity of The Telaga Warna Telaga Pengilon Nature Park was 31,302 visitors, the real capacity was 869 visitors/day and the effective carrying capacity was 579 visitors/day. Thus, the sustainable tourism development strategy is needed to manage the everlasting natural resources.

Keywords: Telaga Warna Telaga Pengilon; Carrying Capacity; Sustainability

1. Introduction

Forest ecosystems in protected areas has the uniqueness of the landscape as well as the biodiversity[1]. As an attempt to preserve the nature, sustainability activities in tourism sector is needed, which is called sustainability tourism. The sustainability tourism will balance the positive and negative impact from tourism activities[2].

Tourism activities in a protected area are related to the characteristic and the congruence of the area as a destination for ecotourism. The right ecotourism planning and management are needed in order to decrease the negative impact caused by the tourism activities and to maximize its positive impact [3]. To preserve the environmental quality of the tourist object, integrated management effort has to be applied [4]. The ability of the environment to support human life, living creatures, and the balance between the two is called the environmental carrying capacity. Environmental carrying capacity studies are very crucial to be conducted. These studies are the preventive precaution measures to avoid the environmental destruction [5].

2. Methods

The method used in this study was qualitative. Information was obtained throug questionnaires. The carrying capacity of environment was determined by using the calculation of physical carrying capacity, real carrying capacity and effective carrying capacity. The questionnaires was filled out by visitors and the manager of the Telaga Warna Telaga Pengilon. The number of visitors was determined using the formula slovin with accuracy boundary of 10%. The research was located at Jojogan Village, Kejajar District, Wonosobo Regency, Central Java province. The location was one of the tourist attractions at the Dieng Plateau which managed by the Central Java BKSDA, the Ministry of Environment and Forestry.

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2.1. Physical Carrying Capacity/PCC

Physical carrying capacity intended to find out the limit of maximum excursions by considering the satisfaction in travelling in a unit of time [6].

$$PCC = A.\frac{1}{B}.Rf \quad (1)$$

Note:
PCC = Physical Carrying Capacity
[1] = Area for touristm activities
[2] = The required tourist area to obtain satisfaction in tourism activities

2.2. Real Carrying Capacity/ RCC

Real carrying capacity was the result value of physical carrying capacity based correction factors that have been determined because it is considered influential in tourism activities. Some elements into the correction factor was vegetation, slope, landscape potential, rate of erosion and rainfall.

$$RCC = PCC.\frac{100 - cf\,1}{100}.\frac{100 - cf\,2}{100}.\frac{100 - cfn}{100} \quad (2)$$

Note:
RCC = Real Carrying Capacity
Cf = Correction Factor

2.3. Effective Carrying Capacity/ ECC

The effective carrying capacity was the maximum value for the number of visits at certain locations by considering the management capacity the real carrying capacity.

$$MC = \frac{Rn}{Rt}\ .100\% \quad (3)$$

Note:
MC = Management capacity
Rn = The Officer on duty
Rt = The officer required for on duty

The capacity management will affect the real carrying capacity, it's called the effective carrying capacity

$$ECC = MC.RCC \quad (4)$$

Note:
MC = Management Capacity
ECC = Effective Carrying Capacity
RCC = Real Carrying Capacity

3. Results

Telaga Warna Telaga Pengilon was located at an altitude 1965-2300 meters above sea level. The area was composed of ecosystems covered by plants such as *Acacia Sp.*, *Pinus* Sp., *Podocarous* sp., *Schima wallichii.*

Fig. 1. Location of Telaga Warna Telaga Pengilon

Tourism activities were increased the number of visitors over the last few years. These trends were influenced by the nature-themed tourism, accomodation and the ease of access information such as internet information, newspaper on the objects that they visit. Telaga Warna Telaga Pengilon area is a challenging locations as destination activities and nature tourism activities in accordance with the natural surroundings. In the conservation area it is possible to obtain the knowledge so that it can be packaged into various forms of tourism activities [7].

Table 1. Total visitors the last 4 years

Year	Total Visitor [visitor/year]
2012	155.516
2013	210.372
2014	345.393
2015	388.521

The value of physical capacity shows that customer satisfaction will remain awake even if the visitors of Telaga Warna Telaga Pengilon raise into 31.302 people. The value of the physical carrying capacity was based solely on the area of conservation without considering other environmental factors. Biotic and abiotic environmental conditions are the limiting factor in the physical carrying capacity so that it can be regarded as the real carrying capacity of a tourist area.

Table 2. The correction factor value of environmental carrying capacity

Correction Factor	value Index	Value Factor Correcting
Simpson diversity index	0,586	0,414
Bureau Of Land Management index	0,56	0,44
Slope Index	0,48	0,52
The type of soil against erosion sensitivity	0,60	0,40
Rainfall index	0,267	0,733

Calculation of the real carrying capacity of Telaga Warna Telaga Pengilon was 869 visitor/ day. It means that the Telaga Warna Telaga Pengilon will be received a negative impact on the biotic and abiotic environments when the number of visitors exceeded into 869 visitors per day. The negative impact on the abiotic environment can be seen in the area, such as degradation of water quality due garbage, fandalisme action, etc. While the negative impact on the biotic environment also has been happpen such as disruption of the distribution of birds in the area

The value of the effective carrying capacity of the Telaga Warna Telaga Pengilon was 579 visitor/ day. That means if one day the tourist area can accommodate 579 visitors in accordance with the capacity management. It can be said that if the number of visitors is not more than the value of ECC, the ecosystem will not be negatively affected and the visitors will still get good service Management Capacity with a value of 66.67% has an effect on the level of visitor satisfaction. Management capacity less than optimal, it can affect the maintenance and monitoring of the tourist area. The value of Management Capacity can be increased 33.33% by adding the officers in accordance with the necessary requirements so that it will correspond to the real carrying capacity calculation. Adding a place to enjoy the lake it is possible to break the concentration of visitors. it was intended so that visitors do not accumulates at one point. Carrying capacity is flexible, because the physical carrying capacity of the region would change which is influenced by other factors including the pattern of a visits, the experience

of the visit, the climate, and policy manager. Flexible carrying capacity can be maximized by adding attractions and supporting facilities in the area provided [8].

The value of the real carrying capacity was not exceeded in comparison with the average amount of visitors/day in the last four years, namely 753 visitors/day. However, when it was compared to the effective carrying capacity, the value had exceeded the average amount of visitors per day in the last 4 years. An ecosystem had the ability to recover against a disturbance, on condition that the disorder does not take place continuously, and requires a certain time. [4].

4. Conclusion

The environmental carrying capacity in the area is not constant but dynamic, so the ability of a system can be increased or decreased. Sustainable development strategy tourism is necessary for the management of natural resources sustainability. Sustainable tourism aims to manage all natural resources as best as possible. Management of tourism is determined based on the ability of the manager to manage resources and potential, with attention to the impact on the environment.

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Effevtiveness of Waste Management in Mataram City

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Abstract

Matataram city as National Activity Center (NAC) led to increased activity that occurs in this region. This resulted may increasing population or inhibitations and the amount of waste. The amount of waste in Mataram City currently reaches 1,444 m^3/day and that has been transported by the Sanitation Department as much as 1,033.82 m^3 or 71.59%. This research aims to analyze the effectiveness of community-based waste or the waste management. The method used is quantitative descriptive analysis of waste heaps and analysis of waste management. The results of the analysis of waste heaps in the next 10 years (2026) is the amount of waste reaching 2,019 m^3/day. By using the analysis of waste management, if today exist of 25 units machines and 48 waste management group that effectively utilized, then in one day could process 948 m^3 or as much as 65.65% of the waste managed by the community. So to solve this waste problems, collaboration between government and the community is needed in order to manage the waste in Mataram City.

Keywords: Activity center; community-based; waste management;

1. Introduction

According to the constitution number 18 / 2008 waste is the remnant of everyday human activities or natural processes in the solid form. Generally waste management technique in Indonesia are; waste disposal, onsite waste processing, waste collection, waste processing and and final processing [4].

Mataram city is the capital of West Nusa Tenggara ,which became the National Actifity Center (NAC) to function as the central government, public service center of regional and national scale, the center of trade and services, regional and national scale as well as a major transportation node National scale ground. As National Activity Center (NAC) and as the central provincial capital city of Mataram lead to be the first choice in the move and reside. These conditions resulted from year to year the number of people in the city of Mataram is increasing. The population of the Mataram city in 2015 as many as 441,064 inhabitants which is the number is increased from the year 2010 as many as 402,843 inhabitants.

Table 1. Total Population of Mataram 2014

Districts	Area (Km^2)	Population (Jiwa)
Mataram	10,76	81.450
Ampenan	9,46	86.052
Cakranegara	9,67	66.516
Sekarbela	10,32	62.508
Selaparang	10,77	74.513
Sandubaya	10,32	70.025
Jumlah	61,30	441.064

Source: Mataram in Figures, 2015

The increasing of population and activities in Mataram has impacted on the amount of waste productions, which is the amount of waste has increased in 2010 the number reached 441,650 m^3 of midden and increase in 2011 reached 446,790 m3. This is in line with the average increase of solid waste every day, which reached 1,444 m^3/day in 2016. At this moment the infrastructures in Sanitation Department of Mataram City will be hauling waste every day as much as 1,033.82 m3 (71.59%). In addition to the problem of solid waste, sanitary landfill is also very important issue to be

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addressed in Mataram. Currently the sanitary landfill site for waste in Mataram City residents disposed of to Kebon Kongok landfill located in District Gerung, West Lombok Regency within ± 29 km from the Mataram city. Mataram city has limitations in the provision of sanitary landfill in the jurisdiction because the absence of a decent location as landfill.

Mataram City area is 61.30 km^2, which is dominated by the use of plots in residential areas with amenities such as supporting the existence spread throughout the city of Mataram. While based on the requirements that must be met in building landfills are:

a. Points are not built near sources of drinking water or other water sources used by humans
b. Not in a place often hit by floods
c. The place far from human residence

The distances are often used to measure the minimum distance of the location of landfills from residential areas while the population is 2 km, from the sea as far as 15 km and 200 m of water resourches, so that the standard has been no single location in the heart of Mataram city who meet these requirements. The problem of waste in Mataram city that require serious attention for local governments himself or for environmentalists. Then the research will examine the potential of waste management groups and their existing waste management infrastructure.

2. Methods

2.1 Types Of Research

This research uses a case study approach and field research, where the goal is to intensively study the background, the last status and environmental interactions that occur in a social unit. A case study investigating the many variables and many conditions on a small sample (Azwar S., 2014 : 8).

2.2 Research Focus

This study aims to determine the effectiveness of waste management in Mataram with a focus on community empowerment groups that have been formed in the city of Mataram. This study focuses on the ability of a group of communities in managing organic and inorganic waste.

This research uses descriptive quantitative aproach with the populations are the entire waste management groups in Mataram as many as 48 groups and the sample are as many as 10 groups with the classification of processing of organic waste and inorganic waste. The selected sample is a group that is active in waste management, namely: Komunitas Hijau Biru, Kimzeefarm, Muda Kratif, Pokja Lisan, Kampung Hijau, KSM Bersih, KSM Terampil Pagutan, Peduli Lingkungan, Banjar and TPST Sandubaya.

To determine the effectiveness of 5 (five) concept in effectiveness criteria proposed by Sterss in Tangkilisan (2005), this research used only the productivity criteria, because these criteria can be measured.

2.3 Techniques of Data Collection and Data Analysis

This research uses data collection techniques such as: direct observation and interviews. Primary data collected in the form of information related to government policy about waste management in Mataram. While the methods of documentation used to obtain secondary data like the number of population, waste infrastructure and the amount of midden.

The analytical methods are midden analysis and analysis of midden management. The measurement method and composition of midden by SNI M 36-1991-03(02). To predict midden can use the following equation

$$Qn = Qt(1 + Cs)^n \qquad (1)$$

which

$$Cs = \frac{[1+(Ci+Cp+Cqn)/3]}{[1+p]} \qquad (2)$$

Which are:
Qn = n midden in coming years
Qt = midden in the early years of calculation
Cs = increase / growth of the city
Ci = the growth rate of the industrial sector
Cp = the growth rate of the agricultural sector
Cqn = the rate of increase in per capita income
P = population growth rate

The analysis of the management of midden base on the results of a field survey carried out on samples that have been specified above. The result of the survey later acumulated become an average capability of processing waste by the day.

3. Results

3.1. Midden Analysis

The midden in the city of Mataram is very closely related to the amount of waste generated by the sources of litter. Sources of waste may come from settlements, markets, streets, shops, offices, restaurants, hotels and hospitals. The largest source of midden in Mataram city derived from settlements (households) are based on existing documents the amount of waste currently reaches 1.444m^3 / day. Total midden will be higher due to increase in population and the number of activities undertaken by the community.

By means of transportation waste infrastructure at the present time , the number of trash capable of being transported to the landfill every day can reach 1.033,82 m^3 (71,59 % and the remaining still not can be transported to the landfill. To forecast the amount of midden for the next 10 years by using the approach of measuring the composition and waste SNI 36-1991-03 M (02), the predicted amount of waste in the Mataram city as follows:
Based on this formula, then:

a. The amount of midden in Mataram city on 2016 are = 1,444 m^3 / day
b. The growth rate of the industrial sector = 7.22%
c. The growth rate of the agriculture = 2.67%
d. The rate of increase in income per capita = 7.67%
e. Population growth rate = 1.01%

Based on the data above it obtained the increase / growth of the city of Mataram is:

$$Cs = \frac{[1 + (7{,}22\% + 2{,}67\% + 7{,}67)/3]}{[1 + 1{,}01]}$$

$$Cs = 3{,}41\%$$

With the growth kota mataram of 3.41 %, and using formulas $Qn = Qt(1 + Cs)^n$, then obtained a projection of the amount of midden for next 10 years are :

Tabel 2. Projections Of Midden

Years	The Volume of Midden (m^3/day)
2017	1.493
2018	1.544
2019	1.597
2020	1.651
2021	1.707
2022	1.766
2023	1.826
2024	1.888
2025	1.953
2026	2.019

Source : Analiysis, 2016

3.2. Community-Based Analysis Of Waste Management

Mataram city government through various programs have been providing facilities and infrastructure to facilitate the public in waste processing. The infrastructure that has been availe them in the form of a thrasher waste that convert organic waste into a smaller size. Those organic waste processed and converted by the community become more useful materials for example that has developed today is the manufacture of compost. The number of waste processing machine in Mataram is 25 units of machines which is distributed around groups of waste comunity. Generally, the waste processing machine are in good condition, but the fact is the machines are not optimally used by the waste comunities. The waste processing activities in Mataram city can be seen in the picture bellow:

Figure 1 (a) Waste Processing Mechine (b) Waste Processing Activity

Beside that Mataram City Government also has trained several groups of waste processing. There are some comunities formed by social careness, but some of these groups there are still active in the waste processing. On the figure bellow we can see the activity of waste processing of inorganic waste:

Figure 2 (a) and (b) Inorganic Waste Processing by Waste Community

Based on existing data Mataram City has a number of groups concerned about the waste as many as 48 groups scattered throughout the city of Mataram and 25 pieces of waste processing machine. 3R processing machines that were in the city of Mataram is a 3.5-5 hp engine, with a capacity of 1.5 tons / hour (4.5 m^3 / h) and there are several machines sized from 9 to 11.5 pk with a capacity of 3 tons / hour (9 m^3/h) with operating time of 8 hours / day. From these encode, calculations can be obtained if all the average machine capable of processing 1.5 tons / hour capacity of 1 litter the waste processing machine in one day is the capacity 36 m^2/day. So that based on availability encode and the size of the capacity of the machine with the assumption that all the machines are already available in Mataram can operate up to then a day of the machine can process waste as much as 900 m^3 / day.

If all groups of waste processing that already exist in Mataram can the processing of plastic waste into handicrafts and process waste into goods more useful, with one group consisting of at least 5 people so one day be able to process waste as much as 1 m^3/group. So with the number of groups that exist currently as many as 48 groups then can be processed inorganic waste as much as 48 m^3/day. So if pile up the waste in the Mataram city can be managed as many as 948 m^3/day (65.65%) by community groups as compared to the amount of waste that exists today.

4. Conclusion

Based on the results of the discussion above, it can be concluded:

a. The amount of midden in the city of Mataram can be managed optimally by waste community if there is mentoring incentives from the government, private sector and from the universities as much as 948 m ^{3}/day or 65.65% of the amount of waste in 2016
b. The amount of midden will increase in the next 10 years into a 2,019 m^3/day so that the necessary additional facilities both in terms of strengthening the capacity of the machine or waste community.

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The Analysis of Occupant Satisfaction on Service Quality of the Manager (Official-Based Technical Managing Unit) of Mandalika Public Mansion in Mataram City

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Abstract

Mataram City is the capital of West Nusa Tenggara Province. It is a developing city but cannot escape still from perplexing problems that almost all cities/towns to deal with. One problem is related with the presence of the slums due to the excess of population growth which has overwhelmed the availability of urban land. Other problem is the high backlog rate of the housing. The width of the slums in Mataram City reaches 783.39 Ha and it has settled on 25 Sub-Districts and 6 Districts. Backlog (house shortage) has attained 18,723 units. Mataram City Government attempts to cope with slums problem by providing the affordable housing, precisely by building the rented simple public mansion (Rusunawa). Mataram City already has three public mansions, respectively Selagalas Public Mansion, Mandalika Public Mansion, and Montong Are Public Mansion. A new public mansion has been planned to be constructed at Tanjung Karang Permai Sub-District. Mandalika Public Mansion is the second public mansion built on 2014 by Mataram City Government with the allocated fund from the Ministry of Public Works for Indonesia Republic. This mansion was constructed to be provided to the low-income communities (MBR) whose ID-Card stating that they live in Mataram City. Mandalika Public Mansion is located at Mandalika Sub-District, Sandubaya District, Mataram City with area width of 6,000 m^2. It is a twin-block building with 5 stories (floors). Each block contains 98 units. The population of research is 160 family heads who are the occupant of Mandalika Public Mansion. Sampling technique is *simple random sampling* with Slovin Equation, and it results in 61 respondents. The analysis technique is *Importance Performance Analysis* (IPA). Result of analysis shows that there are 4 attributes considered by respondents as main priorities that must be improved. These attributes are the availability of clean water, the availability of drying ground, the collection of garbage, and the availability of facilities for disables.

Keywords : Rented Mansion; Satisfaction; Importance Performance Analysis (IPA)

1. Introduction

City development is definitely influenced by its population growth rate. Higher growth of the population has caused higher demand for land in the city. The most dominant urban activity in using the land is the activity of searching for shelter or for housing. This activity captures more than 50% of land total in the city. It accelerates the scarcity of urban lands that triggers the roaring price of urban land. Expensive price of the land sends implication to the increasing price of the house. It reduces opportunity to the low-income communities to afford more reliable shelter. It means that the shelter becomes less accessible. The difficulty of obtaining affordable house at low cost automatically forces the low-income communities to occupy the vulnerable spots. If this problem is just made negligible, the long-term negative impact would emerge, including the mushrooming of illegal dwellings and slums in the city area.

Being as a city that starts to develop into a metropolitan, Mataram City is the capital of West Nusa Tenggara Province. It is located between West Lombok Regency and Lombok Strait. The coordinate is at 08° 33' -08° 38' South Latitude and between 116° 04'- 116° 10' East Longitude. The coverage is 61.30 Km^2. As shown by the data [3], the population of Mataram City until 2014 is counted for 441,064 heads, with population growth rate of 2.14% per year and also with population density of 7,195 heads per km^2. This significant rate of population growth implies positive and negative impacts. Negative impact is more problematic with the presence of the slums. The environment of the slums may hamper the physical development of the city, give inappropriate visual impression, and reduce community health with unlikely health standard of housing. All of these signalize unfavourable socioeconomic impact. The Decree of Mataram Mayor about the Determination of Slums Location in Mataram City has stated that the width of slums in Mataram City is 783.39 Ha which spreads throughout 25 Sub-Districts and 6 Districts [6].

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Slums must be resolved and the resolution should be pursuant to Law No.1/2011 about Housing and Dwelling. It involves several points to consider: (1) the housing is one of human necessities to improve the wellbeing and welfare of the human; (2) the reliable human and dwelling must be established on the healthy, secured, harmonious and orderly environment. Central government program has been designed to deal with the problems of the slums and the house scarcity (backlog) in Mataram City that has reached 18,723 units (Bappeda, 2013). The most realistic solution by Mataram City Government is by constructing the public mansions. This construction is aimed to accommodate communities who previously live on illegal dwellings and slums, and to relocate them into more reliable and more affordable occupancy. The central government through the Ministry of Public Works has organized the availability of public mansion as the effort to restructure urban slums.

In consistent with Law No.20/2011 about Public Mansion, the definition of public mansion is the building with floors and constructed as an environment with the division of the functionally structured partitions, either to horizontal or to vertical directions. Each partition represents the unit of the building that can be owned and used separately. The usual usage is for dwelling but it stands on the collective area, with collective facilities and collective land (Indonesia Republic, n.d.)

The enthusiasm of Mataram City communities to occupy public mansion is very high. Some public mansions have been built by Mataram City Government, such as undergraduate dormitory in University of Mataram, undergraduate dormitory in IAIN, and public mansion only for the low-income communities (MBR). The first public mansion for the low-income communities is raised on 2011 and it is called as Selagalas Public Mansion, and it is followed on 2014 with Mandalika Public Mansion, and also on 2015 with Mandalika II Public Mansion. Other planned public mansion will be set at Tanjung Karang Permai Subdistrict.

Mandalika Public Mansion is the second public mansion built on 2014 with the allocated fund from APBN and APBD of Mataram City which the total counts for 17 billions rupiahs. Operationally, this public mansion has been occupied in 2015 and is stood on 6,000 m^2 area width. It comprises 2 blocks (twin block) with 5 floors. The occupancy type was Type 24. Each building block contains 98 occupancy units. To occupy this public mansion, the candidates must pass on the eligibility conditions: (1) the candidates must be the citizen of Mataram City whose status is validated by ID Card and Family Card; (2) the candidates must have married or have ever married (in case of divorce); (3) the dependent in the family must be stated on Family Card; (4) the candidates do not have a house at all; and (5) the candidates have minimally income rate at range 500,000 – 2,000,000 rupiahs; this range put them. Rent tariff is the product of the agreement of public mansion neighbourhood. Each floor may have different rent tariff at the range about 100,000 to 150,000 rupiahs.

As observed on field condition, there is a difference between early planning and current condition. The impression of vile has been very significant since 1 year of occupancy. Breakages are prominent on clean water facilities. Sewerage is plugged, and drainage gutter is occlusive. In relation with managerial legality, the Decree of Internal Affair Minister No.14/PERMEN/M/2007 about The Management of Public Mansion, in Article 1 Verse 4, has mentioned that the Manager of the public mansion, in this case called as the Managing Board, is the government agency, or the legal entity, or the general service agency, appointed by the owner of public mansion to implement some managerial functions for public mansion (Republic, 2007). In this matter, the manager of the public mansion is the Official-Based Technical Managing Unit. However, public mansion management is accused as not having a formal legality due to the reason that the bequest process from Central Government to Local Government is still not completed (Pramono, 2016).

Pursuant to the explanation above, and to warrant the sustainability of occupants' life and the feasibility of building, and also to avoid the emergence of vile impression at public mansion environment, the research considers some objectives: (1) to understand the satisfaction rate of public mansion occupants on service quality of the manager; and (2) to recognize attributes needed to improve service quality for public mansion occupants.

2. Methods

Research is conducted at Mandalika Public Mansion, TGH Feisal Cakranegara Road, Mandalika Subdistrict, Sandubaya District, Mataram City on November 2016. Population of research is all occupants of public mansion who are totalled to 160 family heads. Sampling is done with simple random sampling using Slovin Equation (Sugiyono, 2002):

$$n = \frac{N}{1 + Ne^2} \qquad (1)$$

where :

n = sample size

N = population rate
e = imprecision slackness due to error in sampling.
In this research, e is 10%

$$n = \frac{160}{1 + 160.\ (0.1)^2}$$

Therefore, of research population counted for 160 KK with tolerance rate of 10%, the sample of 61 respondents is then obtained. In this research, type of the collected data includes primary data and secondary data, either in qualitative or quantitative categories. Primary data are directly obtained by sending the questionnaire to 61 respondents, organizing interview and conducting observation. Secondary data are collected through making a survey on relevant agencies and conducting the study to relevant literatures which discuss research topic.

Importance Performance Analysis (IPA) is used as the analytical technique to deliver information about the satisfaction rate of service quality by measuring the rates of importance and implementation of service delivery (satisfaction). The result of this analysis is then mapped into Cartesius Diagram. The measuring scale to measure the satisfaction rate of the occupants is Likert Scale with an interval from very negative to very positive ends represented by number 1-5. The reading of the score is arranged as following:

a. Very unimportant/very unsatisfied is given Score 1.
b. Unimportant/unsatisfied is given Score 2.
c. Quite important/quite satisfied is given Score 3.
d. Important/satisfied is given Score 4.
e. Very important/very satisfied is given Score 5.

There are some attributes underlying occupants' satisfaction rate. These attributes are five dimensions of service quality, such as tangible, reliability, responsiveness, empathy, and assurance (Parasuraman, 1990).

Two variables are arranged, which are X and Y. Variable X represents the performance rate of the company in giving satisfaction to the customers, whereas Variable Y is the importance rate of the customers. The equation used in this case is that used by Supranto (2001):

$$Tki = \frac{xi}{vi} x\ 100\% \qquad (2)$$

Where:
Tki = The compatibility rate of respondents
Xi = The score of the assessed performance of public mansion manager
Yi = The score of the importance rate of public mansion occupants

The horizontal axis (X) is indicated by the score of implementation rate, while the vertical axis (Y) is represented by the score of importance rate. Each factor influences the assessment of occupants. This influence is measured by the following equations:

$$\overline{Xi} = \frac{\sum Xi}{n} \qquad (3)$$

$$\overline{Yi} = \frac{\sum Yi}{n} \qquad (4)$$

Where :
X = average score of performance rate
Y = average score of importance rate
n = number of respondent

Next step is to calculate the average scores of importance and performance rates for all indicators. The following equations are used.

$$\overline{\overline{X}} = \frac{\sum_{i=0}^{n} \overline{X}i}{K} \quad (5)$$

$$\overline{\overline{Y}} = \frac{\sum_{i=0}^{n} \overline{Y}i}{K} \quad (6)$$

Where :

X = the boundary of X axis (performance rate)
Y = the boundary of Y axis (importance rate)
K = the attributes that influence customer satisfaction

The terms of the equation will be explained. All are divided into four parts in Cartesius Diagram as shown in Figure 1.

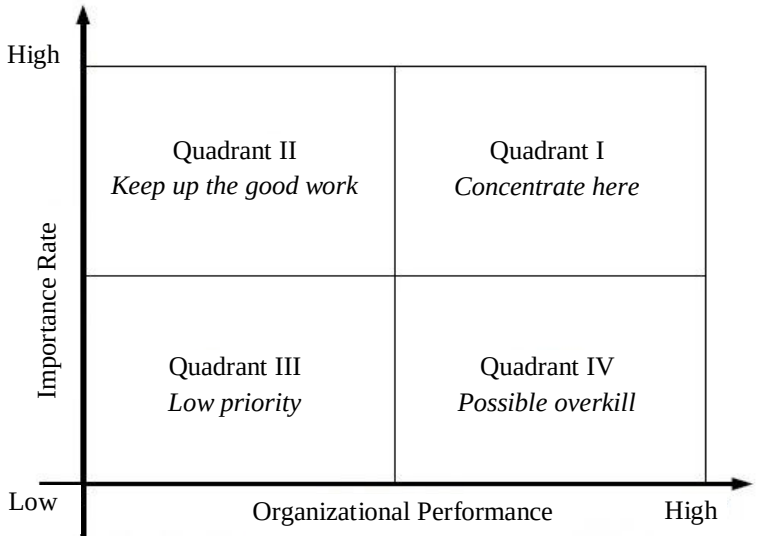

Figure 1. Cartesius Diagram of Analysis on Importance and Performance Rates

All quadrants are described as following:

a. Quadrant I (Concentrate here)
   It includes attributes considered by respondents as important. However, these attributes are below expectation. Satisfaction rate is very low. These attributes in the quadrant should be attended more or be improved to increase performance rate.
b. Quadrant II (Keep up the good work)
   The attributes are important and consistent with what respondents have expected. Therefore, satisfaction rate is relatively high. Attributes in this quadrant should be kept up because all attributes of the service are considered as superior on respondents' eye.
c. Quadrant III (Low priority)
   It contains less important attributes with less influential to respondents. The performance rate is not too good. However, attributes in this quadrant can be still improved despite its very small effect in benefiting respondents.
d. Quadrant IV (Possible overkill)
   The attributes are not important to respondents, and it may too overwhelm. Therefore, some attributes may be eliminated.

3. Results

Data analysis is using Importance Performance Analysis (IPA). It is done against 38 attributes of Mandalika Public Mansion in Sandubaya District, Mataram City. The average scores of performance and importance rates of each attribute of service are displayed in Table 2:

Table.1. Result of The Calculated Average Scores

No	Attribute Code	Attribute	Importance Rate	Performance Rate
1	T1	Strategic location of the public mansion.	4.14	3.63
2	T2	Ultimate transportation to or from public mansion.	3.95	3.66
3	T3	Good conditioned road inside public mansion environment.	4.41	3.97
4	T4	Good conditioned road outside public mansion environment.	4.34	3.92
5	T5	Secured building construction.	4.63	3.80
6	T6	Convenient occupancy space.	4.54	3.88
7	T7	Maximum lighting.	4.39	3.86
8	T8	Optimum ventilation / air circulation.	4.49	4.00
9	T9	The availability of clean water installation network.	4.78	3.71
10	T10	The availability of electric installation.	4.58	3.93
11	T11	The availability of kitchen facilities.	4.47	3.78
12	T12	The availability of toilet facilities.	4.61	3.75
13	T13	The availability of drying ground.	4.42	3.51
14	T14	The availability of prayer facilities.	4.73	3.92
15	T15	The collection of garbage.	4.56	3.64
16	T16	The availability of fire extinguishing facilities.	4.71	3.76
17	T17	The availability of lighting around the environment.	4.53	3.85
18	T18	The availability of facilities for disables.	4.44	3.41
19	R11	Punctual service from the worker/manager.	4.27	3.54
20	R12	Fast and responsive service from the worker/manager.	4.25	3.58
21	R13	The maintenance/treatment of sewerage.	4.46	3.49
22	R14	The maintenance/painting of building periodically.	4.22	3.46
23	R15	Periodic check on sewerage and garbage issues.	4.51	3.56
24	Rs1	Worker/manager's readiness to resolve problem & complaint.	4.46	3.68
25	Rs2	Worker/manager's politeness and friendliness to occupants.	4.51	3.75
26	E1	Worker's care to the confused customers.	3.49	4.15
27	E2	The delivery of service without discriminating status.	3.42	4.06
28	E3	The integrity of worker to deliver service.	3.37	4.10
29	E4	Good way of speech.	3.38	4.17
30	E5	Regulation or order.	4.51	3.88
31	E6	The determination of tariff or price of the rent.	4.27	3.76
32	E7	The availability of playground facilities.	4.15	3.73
33	E8	The availability of sale facilities.	4.10	3.63
34	E9	The availability of conference room.	4.19	3.75
35	E10	The availability of green open space.	4.19	3.63
36	E11	The availability of sport centre.	4.03	3.41
37	A1	Dependable and skilled worker/manager.	4.25	3.73
38	A2	Firm, honest, and trustable worker/manager.	4.41	3.88
Total Average			4.38	3.72

Source : Result of Data Processing, 2016

The diagram of Importance Performance Analysis (IPA) can be made based on the result of scoring above. This diagram is shown in Figure 2.

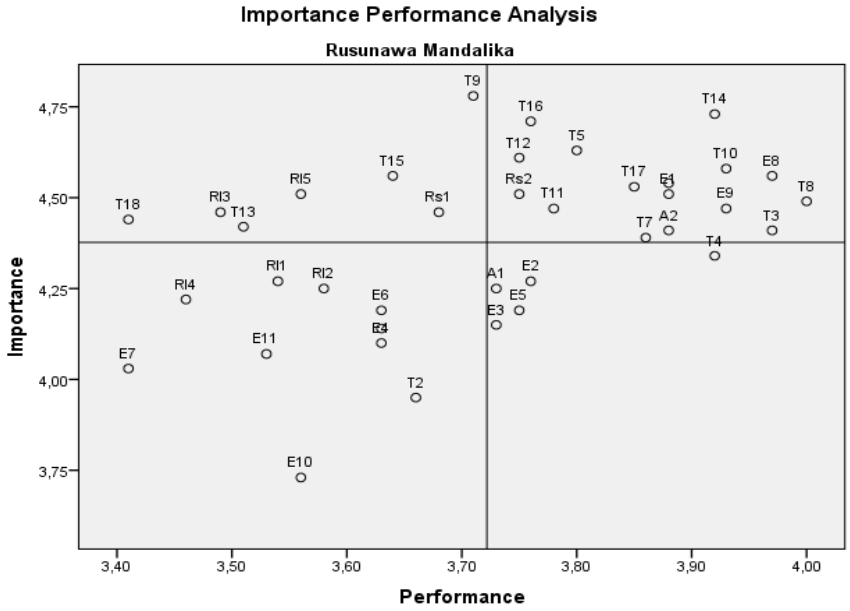

Figure 2. The categorization of service quality attributes into diagram based on *importance performance analysis* (ipa)

As shown in the diagram of Importance Performance Analysis (IPA) above, the attributes of service quality at Mandalika Public Mansion in Sandubaya District, Mataram City are grouped into each quadrant. The attributes in the category "Concentrate here" or Quadrant I are important attributes but with less performance. Complete description is given in Table 2.

Table 2. The Atributes of Service Quality in the Category "*Concentrate Here*" (Quadrant I)

Dimension	Attribute Code	Attributes
Tangible	T9	The availability of clean water installation network.
	T13	The availability of drying ground.
	T15	The collection of garbage.
	T18	The availability of facilities for disables.
Reliability	R13	The maintenance/treatment of sewerage.
	R15	Periodic check on sewerage and garbage issues.
Responsiveness	Rs1	Worker/manager's readiness to resolve problem & complaint.

Source: Result of Data Processing, 2016

Some attributes of service quality at Mandalika Public Mansion in Sandubaya District, Mataram City are assigned into the category "Keep up the good work". Performance rate is just like what the occupants expect for. Table 3 displays these attributes.

Table 3. The Atributes of Service Quality in the Category "*Keep up the good work*" (Quadrant II)

Dimension	Attribute Code	Attributes
Tangible	T3	Good conditioned road inside public mansion environment.
	T5	Secured building construction.
	T7	Maximum lighting.
	T8	Optimum ventilation / air circulation.
	T10	The availability of electric installation.
	T11	The availability of kitchen facilities.
	T12	The availability of toilet facilities.
	T14	The availability of prayer facilities.
	T16	The availability of fire extinguishing facilities.
	T17	The availability of lighting around the environment.
Responsiveness	Rs2	Worker/manager's politeness and friendliness to occupants.
Empathy	E1	Worker's care to the confused customers.
	E8	The availability of sale facilities.
	E9	The availability of conference room.
Assurance	A2	Firm, honest and trustable worker/manager.

Source: Result of Data Processing, 2016

Some other attributes of service quality at Mandalika Public Mansion in Sandubaya District, Mataram City remain within the category "Low priority". The importance rate of these attributes is low. Performance rate is not too special which causes relative low satisfaction. Complete description is provided in Table 4.

Table 4. The Atributes of Service Quality in the Category "*Low priority*" (Quadrant III)

Dimension	Attribute Codes	Attributes
Tangible	T2	Ultimate transportation to or from public mansion.
Reliability	R11	Punctual service from the worker/manager.
	R12	Fast and responsive service from the worker/manager.
	R14	The maintenance/painting of building periodically.
Empathy	E4	Good way of speech.
	E6	The determination of tariff or price of the rent.
	E7	The availability of playground facilities.
	E10	The availability of green open space.
	E11	The availability of sport centre.

Source: Result of Data Processing, 2016

Several attributes of service quality at Mandalika Public Mansion in Sandubaya District, Mataram City are the category "Low priority". The importance rate of these attributes is low. Performance rate is not too special which causes relative low satisfaction. Complete description is provided in Table 4.

Table 5. The Atributes of Service Quality in the Category "*Possible Overkill*" (Quadrant IV)

Dimension	Attribute Code	Attributes
Tangible	T4	Good conditioned road outside public mansion environment.
Empathy	E2	The delivery of service without discriminating status.
	E3	The integrity of worker to deliver service.
	E5	Regulation or order.
Assurance	A1	Dependable and skilled worker/manager.

4. Conclusion

By taking account the result of analysis, it can be concluded that:

1. In the dimension of tangible, the occupants are satisfied with some attributes of service quality, such as: Strategic location of the public mansion; Ultimate transportation to or from public mansion; Good conditioned road inside public mansion environment; Secured building construction; Convenient occupancy space; Maximum lighting; Optimum ventilation / air circulation; The availability of electric installation; The availability of kitchen facilities; The availability of toilet facilities; The availability of prayer facilities; and The availability of fire extinguishing facilities.
2. For the dimension of reliability, public mansion occupants are satisfied with attributes of: Punctual service from the worker/manager; Fast and responsive service from the worker/manager; and The maintenance/painting of building periodically.
3. At the dimension of responsiveness, the occupants of public mansion feel satisfied with the attribute of worker/manager's politeness and friendliness to occupants.
4. The attributes that need improvement to increase performance are The availability of clean water installation network; The availability of drying ground; The collection of garbage; and The availability of facilities for disables.

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Reliability Analysis for Determining Performance of Barrage based on Gates Operation

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Abstract

Some rivers located on a flat slope topography such as Cilemahabang river and Ciherang river in Cilemahabang watershed, Bekasi regency, West Java are susceptible to flooding. The inundation mostly happens near a barrage in the middle and downstream of the Cilemahabang watershed, namely the Cilemahabang and Caringin barrages. Barrages or gated weirs are difficult to exploit since the gate must be kept and operated properly under any circumstances. Therefore, a reliability analysis of the gates operation is necessary to determine the performance of the barrage with respect to the number of gates opened and the gates opening heights. Second moment, First Order Reliability Method was used to determine the performance by the reliability index (β) and the probability of failure (risk). It was found that for Cilemahabang Barrage, the number of gates opened with load (L) represents the peak discharge derived from various rainfall (P) respectively one gate with opening height (h=1m) for P_{real}, two gates (h=1m and h=1,5m) for P_{50}, and three gates (each gate with h=2,5m) for P_{100}. For Caringin Barrage, the results are minimum three gates opened (each gate with h=2,5 m) for P_{real}, five gates (each gate with h=2,5m) for P_{50}, and six gates (each gate with h=2,5m) for P_{100}. It can be concluded that a greater load (L) needs greater resistance (R) to counterbalance. Resistance can be added by increasing the number of gates opened and the gate opening height. A higher number of gates opened will lead to the decrease of water level in the upstream of barrage and less risk of overflow.

Keywords: flood; inundation; barrage; gates operation; reliability analysis

1. Introduction

Cilemahabang watershed covers two districts in West Java. The headwater is located in Cimahabang (Bogor regency) and flows northward into Ciherang river (Bekasi regency). Cilemahabang barrage is located in the segment of Cilemahabang river and across Cikarang Baru which is an important area in Bekasi. On the other hand, Caringin barrage is located in the downstream in segment of Ciherang river.

A barrage is kind of a weir with a low head consisting of several gates that can be opened or closed to control the amount of water passing through the structure. This is often built in the river on a flat terrain where the flow is tends to be slow and potentially overflow when heavy rainfall occurs. Similiar to a weir, the function of a barrage is to divert the flow for use in irrigation and other systems.

Floods in commercial areas, for example in Cilemahabang watershed, which has inundated roads, housing, and hundreds of factories in Cikarang industrial area, have detrimental effects. The most severe flood, which reached up to 1 meter high, was in Cikarang Baru, upstream of Cilemahabang barrage in the middle of Cilemahabang watershed. Another location was in the downstream of Cilemahabang watershed, near Caringin barrage along the Ciherang river. Because the floodwater inundates several areas near the barrage, the operation of both barrages needs to be evaluated.

This study was undertaken to assess reliability of existing barrages and determine of performance by the reliability index (β) and the probability of failure (risk). Among the existing probabilistic methods, the First Order Second Moment (FOSM) was chosen with corresponding to design flood with various return periods. The reliability analysis will focussed on operational of the barrages with respect to the number of gates opened the gates' opening heights. At last, the result from this study can become a suggestion for local government (Head of Perum Jasa Tirta II Water Management Division I section Lemahabang) to update the Standard Operating Procedure (SOP) of those two barrages, Cilemahabang and Caringin barrages.

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2. Literature Review

Analysis of uncertainties and risks in the hydraulic structures have been developed in recent decades. Reliability of hydraulic design in open channel has also been studied, e.g. the reliability analysis of composite channels was carried out using Advance First Order Second Moment (AFOSM) formulation and Monte Carlo Simulation (MCS) method. Both methods consider the channel design and run off parameters as uncertain variables [3]. The channel design parameters, including friction factors, longitudinal slope, channel width, side slope, and flow depth, while rainfall intensity and drainage as the uncertainty of run off. The study carried out a detailed sensitivity study on reliability index for different values of system loading in both static and dynamic environment. It can be concluded from sensitivity analysis that flow depth and bed width were the most influencing parameters that affect the safety factor and reliability.

Another study, an assessment of storm water drain network located in northern part of Bangalore, India has done by considering three failure modes using AFOSM method [4]. There was a need to take into account the uncertainties due to natural and/or inherent randomness for designing a storm water drain network that can effectively convey the discharge. Three parameters were considered to be random variables, namely design flow, conduit dimensions, and roughness of lining material. As a result from reliability analysis, indicate a need to redesign several location of the conduits by the changing of conduit width, slope, or the roughness of conduit lining material.

2.1 Concepts of Reliability and Risk

Tung et.al. (2006) [2] with reference to American dictionaries defines risk as the probability of failure to achieve the intended goal. Reliability is defined mathematically as the complement of the risk. Failure of an engineering system can be defined as a situation in which the load L (external forces or demands) on the system exceeds the resistance R (strength, capacity, or supply) of the system. Meanwhile, the reliability is defined as the probability of nonfailure (survive) in which the resistance of the system exceeds the load. The mathematical definitions of reliability and failure probability can be seen as,

$$P(survive) = P(L \le R) \quad and \quad P(failure) = P(L \ge R) \tag{1}$$

2.2 First Order Second Moment (FOSM) method

The First Order Second Moment (FOSM) method simplify the functional relationship between independent variables and dependent variable by a truncated Taylor series expansion. The inputs and outputs of these methods are expressed as expected values and standard deviations [3]. This approaches account for uncertainty or randomness in the design parameters by constructing their probability density functions (PDFs).

One of the best-known probability density functions is that forming the familiar bell-shaped curved for the normal distribution [1], which can be expressed as,

$$f(x) = \frac{1}{\sqrt{2\pi}\sigma} \exp\left[-\frac{(x-\mu)^2}{2\sigma^2} \right] \tag{2}$$

Where x = random variable, μ = mean and σ = standard deviation. If loads and resistances, as well as the parameters determining loads and resistances, are normally distributed, or if their distributions can be approximated by or transformed into normal density functions, the probability of failure of the structure can also be determined from the normal distribution.

3. Methods

3.1. Hydrology Analysis using software HEC-HMS 3.5

This analysis was done to determine the design flood for any return periods (50 years, P50 and 100 years, P100) and from extreme rainfall (Preal) during the time period 1993-2009. HEC-HMS uses a separate model to represent each component of the runoff process, including models that compute runoff volume/losses, models of direct runoff, models of baseflow, and models of channel flow/routing.

3.2 Hydraulic Analysis using software HEC-RAS 4.1.0

The objective of this step is to determine the water surface profiles in the river near the Cilemahabang and Caringin barrages and to calculate the discharge through the gates for various combinations of the gates opened. As the river geometry models, three major tributaries are considered, namely Kali Rasmi, Kali Buntu, and Ci Pegadungan. They will all flow into the main Ciherang river as depicted in Figure 1.

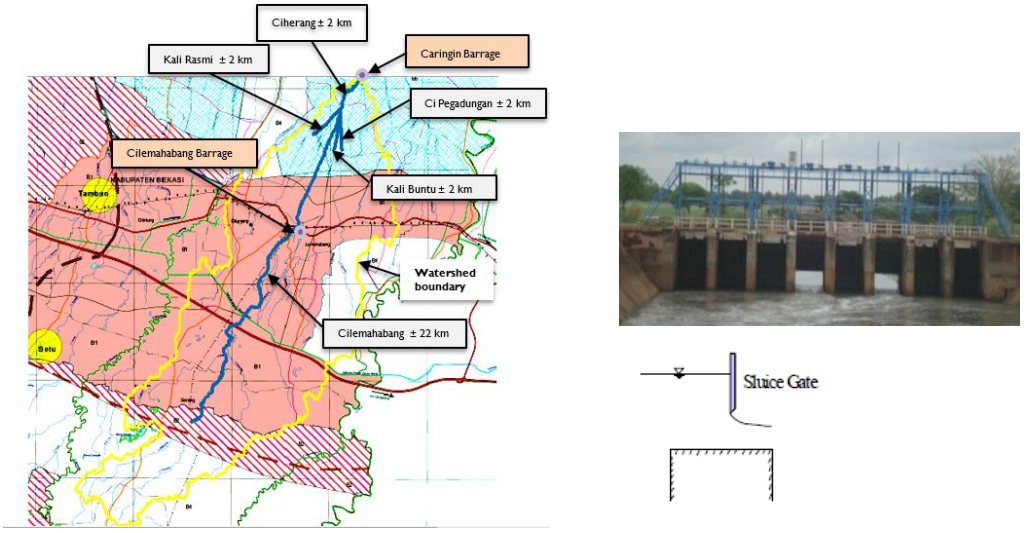

Fig. 1. (a) The layout of Cilemahabang river channel networks (main channel and tributaries); (b) The barrage with low broad crested and several gates which set between flanking piers

3.3 Reliability Analysis

This analysis was carried out to determine its performance based on gates operation. Equations below were used to calculate the reliability index (β) and the probability of failure or risk [2].

Reliability index: $\beta_r = \frac{\mu_z}{\sigma_z} = \frac{\mu_R - \mu_L}{\sqrt{\sigma_R^{\,2} + \sigma_L^{\,2}}}$ *(3)*

Probabilty of failure and Probability of survive: $P(\text{failure}) = 1 - \Phi(\beta_r)$ *and* $P(\text{survive}) = \Phi(\beta_r)$ *(4)*

Where $1 - \Phi(\beta_r)$ is risk and $\Phi(\beta_r)$ is reliability with its values are tabulated in PDFs normal distribution tables, and these values may be approximated by the following polynomial [1].

$$B = \frac{1}{2}\left[1 + 0{,}196854|\beta_r| + 0{,}115194|\beta_r|^2 + 0{,}000344|\beta_r|^3 + 0{,}019527|\beta_r|^4\right]^{-4} \quad (4)$$

Where $|\beta_r|$ is the absolute value of reliability index β_r and the standard normal distribution has

$\Phi(\beta_r) = B$ *for* $\beta_r < 0$

$\Phi(\beta_r) = 1 - B$ *for* $\beta_r \geq 0$

The error in $\Phi(\beta_r)$ as evaluated by this formula is less than 0,00025.

4. Results

The design flood was calculated as the Load (L) and the discharge both free flowing and submerged weir flow through the gate openings as the Resistance (R). To avoid a risk of overflow, the water elevation upstream should be kept below the surrounding ground elevation (+11,126 m for Cilemahabang barrage and +5,200 m for Caringin barrage). The result about water elevation upstream of the barrage considering several combinations of the gates operation is summarized in Table 1.

Table 1. The water elevation upstream with several combinations of the gates opened based on various rainfalls P_{real}, P_{50}, and P_{100} (CLB = Cilemahabang barrage with 7 gates; CRB = Caringin barrage with 8 gates)

number of gates (pc)	opening height (m)	Water elevation upstream of barrage (m)					
		P_{real}		P_{50}		P_{100}	
		CLB	CRB	CLB	CRB	CLB	CRB
0	-	11,13	5,48	11,21	5,53	11,18	5,5
1	1 m	11,08	5,37	11,2	5,53	11,18	5,5
2	1 m; 2,5 m	11,08	5,24	11,07	5,48	11,17	5,5
3	#gate 2,5 m	10,12	5,16	11,01	5,37	10,96	5,45
4	#gate 2,5 m	9,69	5,16	10,3	5,25	10,96	5,34
5	#gate 2,5 m	9,39	4,11	9,86	5,11	10,04	5,22
6	#gate 2,5 m	9,13	3,84	9,47	5,11	9,59	5,08
7	#gate 2,5 m	8,85	3,63	9,24	4,24	9,48	5,07
8	#gate 2,5 m	-	3,46	-	4,02	-	4,67

Table 2 shows the results of reliability analysis based on gates operation with the design flood was derived from extreme rainfall (P_{real}).

Table 2. Results of reliability analysis based on gates operation

number of gates (pc)	opening height (m)	Reliability analysis									
		$\mu_Z = \mu_R - \mu_L$		$\sigma_Z = \sqrt{\sigma_R^2 + \sigma_L^2}$		$\beta_r = \mu_Z / \sigma_Z$		$\Phi(\beta_r)$ (%)		$Risk = 1 - \Phi(\beta_r)$ (%)	
		CLB	CRB	CLB	CRB	CLB	CRB	CLB	CRB	CLB	CRB
1	2,5 m	-56,9	-107	17,77	29,40	-3,20	-3,63	0,09	0,02	99,91	99,98
2	#gate 2,5 m	-36,9	-70,1	17,83	29,34	-2,07	-2,39	1,90	0,85	98,10	99,15
3	#gate 2,5 m	0,003	-35,4	24,46	30,36	0,00	-1,17	50,01	12,18	49,99	87,82
4	#gate 2,5 m	4,99	-18,9	22,56	29,91	0,22	-0,63	58,75	26,39	41,25	73,61
5	#gate 2,5 m	10,4	4,16	21,29	30,48	0,49	0,14	68,72	55,41	31,28	44,59
6	#gate 2,5 m	20,55	31,83	19,98	32,54	1,03	0,98	84,79	83,58	15,21	16,42
7	#gate 2,5 m	66,97	50,91	18,22	33,28	3,68	1,53	99,98	93,71	0,022	6,29
8	#gate 2,5 m	-	70,02	-	34,18	-	2,05	-	97,99	-	2,01

5. Conclusions

From the calculation and analysis, it can be concluded that: **(1)** For Cilemahabang barrage, the number of gates opened should be one gate with opening height (h=1m) for P_{real}, two gates (h=1m; h=1,5m) for P_{50}, and three gates (h=2,5m) for P_{100}. **(2)** For Caringin barrage, there should at least be three gates opened (h=2,5 m) for P_{real}, five gates (h=2,5m) for P_{50}, and six gates (h=2,5m) for P_{100}. **(3)** The reliability index will increase if more gates were opened.

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Publik Perception against the mode of transportation based online (G0-jek) in Malang

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Abstract

The limited access of public transport to serve community needs in urban areas will result in the emergence of alternative transport, in response to the limitations of access. This generally happens in the cities of Indonesia. Online taxi or known as Go-jek is an alternative transport in the city of Malang at this time. The service is quite helpful for all people as well as address some of the issues at hand, such as congestion. The services provided by the service provider Go-jek not only as a passenger shuttle. To use the service Go-jek simply by using the Go-jek applications exist in smart phones. On the application of Go-jek there are some options that we can use to suit your needs as well as their functions, such as *Go-Ride, Go-Car, Go-Food, Go-Send and Go-Massage*. This distinguishes Go-jek with conventional taxi. With the growing number of customers and does not cover the possibility of competition required improvements to the services from time to time. Data collection is carried out by the Division of the questionnaire to respondents. Withdrawal of samples using the method of *accidental sampling*, with as many as 100 respondents. This research uses the *Importance Performance Analysis* (IPA) and the *Costumer Satisfaction Index* (CSI).

Keywords: Perception; Interests; Satisfaction; Go-jek

1. Introduction

In the era of globalization and the development of very rapid population growth, many of the changes and the needs of the community. These conditions make the community must be able to work and do other activities quickly and efficiently.

Recently transformed into a taxi transportation professionals supported by the sophistication of the technology that is called go-jek. Go-jek is a company of services that offer speed,convenience and security. The Ministry can be resized with the five dimensions that is, *Reliability, Responsiveness, Assurance, Empaty,* and *Tangible.* The quality of the services provided by go-jek will affect public perception differently against the use of the services (1). This occurs because of a perception of a sensory stimulus moves after catching the senses given information. The perception is the experience of objects, tours or relations obtained by summing up the information and messages (2). Perception is a cognitive processes experienced by everyone in understanding their environment, both through sight, hearing, feeling, and acceptance comprehension (3).

2. The Content

2.1. Methods

This research uses the *Importance Performance Analysis* (IPA) to measure the importance of the variable and the level of satisfaction toward performance (4). Customer Satisfaction Index (CSI) is used to view the percentage of consumer satisfaction as for the collection of data using a questionnaire which was distributed to the respondents. Respondents involved in this research are 100 respondents. Determination of the number of respondents using the formula 15 or 20 times the free variable (5 = number of free variables) (5). The selection of respondents in research using the method of *Accidental Sampling* (6).

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2.2. *Research Results*

Based on the results of the calculation by using the method of the IPA, the variables that need to get attention are the variables that are present in quadrant IV. On the results of the analysis to see that quadrant IV is a factor considered important and be in bad condition so that the necessary attention and improvement. Importance and satisfaction in this research are presented in the form of a cartessius diagram (Figure 1). As for the variables that are in quadrant IV consists of waiting time to short, the ability to reach a specific location, driver take you up to the right destination and reliable drivers.

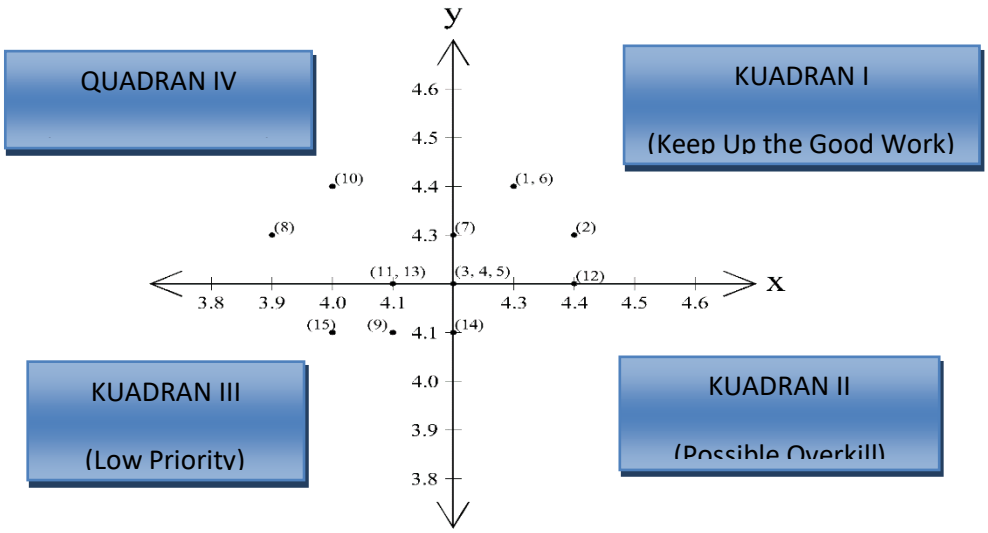

Figure 1. Diagram of the results of *Importance Performance Analysis* (IPA)

For the results of the calculation with the *Customer Satisfaction Index* (CSI) toward customer satisfaction go-jek form can be seen in table 1.

Table 1. Customer Satisfaction Index

No.	Statement	Satisfaction (P)	The Interests Of (I)	Score (S)
		Scale of 1-5	Scale of 1-5	S = (P) x (I)
A	Proof Of Physical (Tangible)			
1	Physical state (condition of motor in good condition)	4.3	4.3	18.2
2	Equipment (Drivers use uniforms, helmets, etc.)	4.4	4.3	18.6
3	Number of vehicles (vehicles available in a sufficient number of)	4.2	4.2	17.6
B	Empathy (Empathy)			
4	Operator proficiency (fast catch your complaint)	4.1	4.1	16.7
5	Drivers give attention to you	4.2	4.2	17.7
6	Drivers concerned over safety together	4.3	4.4	18.7
C	Responsiveness (Responsiveness)			
7	The capability of providing services quickly	4.2	4.3	18.2
8	Booking short waiting time	3.9	4.3	16.8
9	The driver understands your needs	4.1	4.1	16.6
D	Reliability (Reliability)			
10	The ability to reach a specific location	4.0	4.4	17.6
11	Driver to take you to the correct destinations	4.1	4.2	17.1
12	Drivers transport you in a short time	4.4	4.2	18.6
E	Assurance (Assurance)			
13	Reliable driver	4.1	4.1	16.9
14	Drivers obey traffic rules	4.2	4.1	17.2
15	You feel safe from crime	4.0	4.1	17.2
	Total		63.3	263.44

The results of calculations using the CSI in can values of 0.83. The value of the interval value of 0.81-1.00 which means customers/consumers felt "very satisfied" on performance of Go-jek this time. The satisfaction of this doesn't mean that management Go-jek doesn't need to improve service levels. Repair service levels is indispensable as on a Cartesian diagram Quadrant IV.

3. Conclusion

The results of calculations using the IPA there are four variables that are declared vital for customers but low capability and need attention, the waiting time for booking short, the ability to reach a specific location, the drivers take you to the right destination, and reliable drivers while the performance is considered good and needs to be retained is composed of, the physical state of the vehicle, the driver uses the complete equipment, adequate number of vehicles operator proficiency, in response to complaints, the drivers give personal attention to you, the drivers concerned over safety together, the ability of providing services quickly, and the drivers take you in no time.

For calculations using the CSI found value of 0.83. The value of the interval value of 0.81-1.00 which means consumers feel very satisfied against the performance of the current Go-jek.

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The Customer Satisfaction Towards The Service Quality of Tawang Alun Malang-Banyuwangi Train

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Abstract

Service sector which has quiet vital role in supporting people's daily activities is transportation service. Transportation is one of the important and strategic developments in improving economy sector; it can also unite many people and affect all the aspects of life. One of the alternative ways to overcome people's need of transportation is by providing trains. This research was conducted on the weekend that has objectives to analyze the work performance of Indonesian Railway Company towards the service quality that can determine the customers' satisfaction of Tawang Alun Malang-Banyuwangi train and to analyze the customers' satisfaction itself towards the service quality of Tawang Alun Malang-Banyuwangi train. This research used quantitative descriptive as the research method. There are two kinds of data that were used in this research; the first one is the primary data taken from questionnaire's results and interview meanwhile the second one is the secondary data taken from literature and internet. The sample used in this research is nonprobability sampling using convenience sampling technique. Data analysis used in this research is Importance Performance Analysis (IPA) and Customer Satisfaction index (CSI).

Keyword : customer satisfaction; service quality of Indonesian Rail Company; Importance Performance Analysis (IPA); Customer Satisfaction index (CSI)

1. Introduction

Transportation is an important and strategic improving sector in order to expediting people's economy, unite many people and affect all the aspects of life. This condition forces people to be able to work and do many activities efficiently and on time [1]. The importance of transportation reflects to the increasing number of transportation service of mobilization for people and goods since there are growing populations and housings. To fulfil this kind of need, the transportation service needs to be provided more including the numbers and the qualities (safety, comfort, on time schedule and efficiency). One of the alternative ways to overcome people's need of transportation is by providing trains. Trains are kind of transportations with many advantages compare to the other kinds of transportation including the less fuel, less energy used, less pollution, no traffic jam and it is a mass transportation.

[2] This perception is the experience towards objects, tourism or something taken by collecting information and suggestions. This research was done with objectives: analyzing the work performance of Indonesian Railway Company towards the service quality that can determine the customers' satisfaction of Tawang Alun Malang-Banyuwangi Train, as well as analyzing the customers' satisfaction towards the service quality given in Tawang Alun Malang-Banyuwangi Train. Service quality can be measured by using theories by [3] expressing five dimensions which are reliability, responsiveness, assurance, empathy and tangible.

2. Methods

This research used descriptive quantitative research method. The sample taken for this research is nonprobability sampling using convenience sampling technique. The data acquisition was done by doing direct observation and interview and spreading questionnaires to get the primary data, meanwhile for the secondary data came from the references. The method to pick the samples used is non probability sampling method using convenience sampling technique. The number of respondents in this research was determined by using Slovin formula [4] which is:

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$$n = \frac{N}{N(e)^2 + 1} \quad (1)$$

Information:

n = the number of samples
N = the measurement of population
e = the percentage of inaccuracy because of sampling error that can be tolerated 10%

The number of people who used Tawang Alun Train is more than 300 people on the weekends, so based on the formula, the respondents are 75 respondents.

The data analysis used in this research is Importance Performance Analysis (IPA) and Customer Satisfaction Index (CSI). The Importance and Performance Analysis is used to get information about the level of customers' satisfaction towards certain service by measuring its importance and implementation level. IPA is an implementation method to measure attribute based on the importance and work performance or satisfaction level which is useful to improve the market strategy for the company to be more effective [5]. In this technique, the respondents was asked to assess the importance and implementation level, and then the average value of importance and implementation level were analyzed with Importance Performance Matrix, in which the x axis represents perception or work performance meanwhile y axis represents hopes or importance. And later, the result of the x and y value (from each variable) in the four quadrant on Kartesius diagram can be drawn. There is also interpretation from squared which is quadrant I (Keep up the Good Work); quadrant II (Possible Overkill); quadrant III (Low Priority) and quadrant IV (Concentrate Here).

The measurement towards customer satisfaction index is needed because the result from the measurement can be used as the reference to determine targets in the next few years. According to [6] the measurement towards the CSI is needed because the result from the measurement can be used as the reference to determine targets to improve the service quality towards the level of overall respondents' satisfaction which can be seen from the criteria of customers' satisfaction level. CSI can be taken from (T divided by 5Y) x 100%. 5 (in 5Y) is the maximum value which is used on the measurement scale. The CSI formula which is :

$$CSI = \frac{T}{5Y} x100\% \quad (2)$$

Information:

CSI : *Customer Satisfaction Index*
T : Overall numbers of S variable
Y : Overall numbers of P variable
S : Multiplication from I and P value (each variable)
I : The average of satisfaction or Work Performance (each variable)
P : The average of the importance (each variable)

The level of overall respondents' satisfaction can be seen from the criteria of the customers' or consumers' satisfaction level, with the criteria as follows:

Table 2 Criteria Consumers' Satisfaction

No.	CSI Value	Customer Satisfaction Index
1.	0,81 – 1,00	Very Excellent
2.	0,66 – 0,80	Excellent
3.	0,51 – 0,65	Good
4.	0,35 – 0,50	Poor
5.	0,00 – 0,34	Very poor

3. Results

3.1 Importance Performance Analysis (IPA)

The analysis of Important Performance Analysist (IPA) in this research used to analyze the factors related to importance and people's satisfaction in using Tawang Alun Malang-Banyuwangi Train. The result will be presented in a form of Kartesius Diagram, in which the diagram has quadrants contains of Keep Up the Good Work (quadrant I), Possible Overkill (quadrant II), Low Priority (quadrant III) and Concentrate Here (quadrant IV). There is also a Kartesius Diagram of Tawang Alun Malang-Banyuwangi Train as follows :

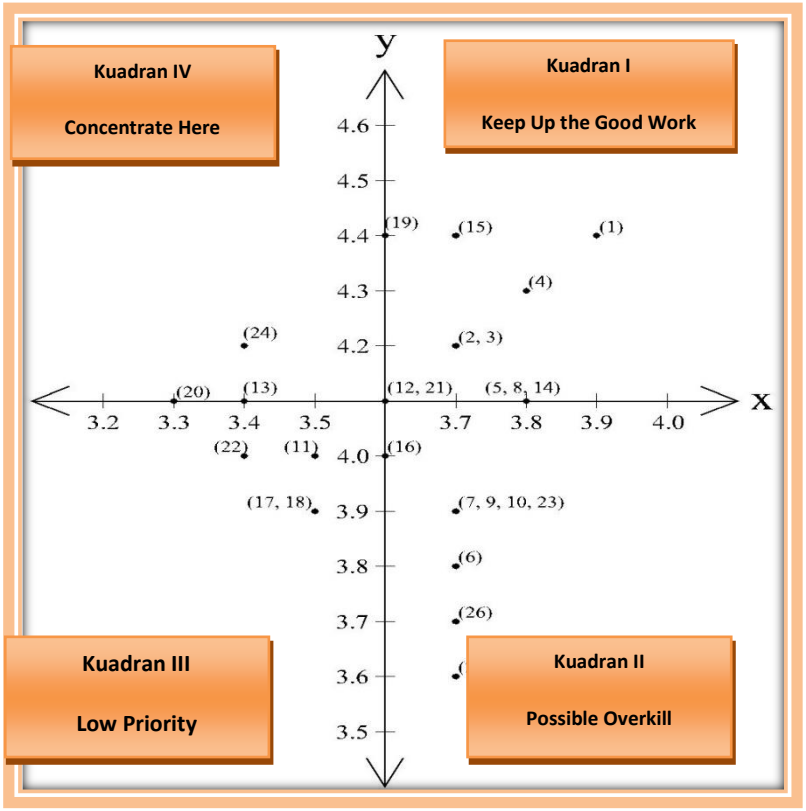

Figure1. Picture of kartesius diagram of tawang alun Malang-Banyuwangi train

Based on the result of the counting using IPA method, the variables that need to get more attention is the factor in quadrant IV. The result of this analysis shows that the quadrant IV is the factor that is considered important and it's in bad condition so it needs to be noticed and fixed. The analysis of these factors can be seen on the table.

Table 1. Analysis Factors of Customers' Satisfaction towards Tawang Alun Train on Quadrant IV

No.	Variable	Satisfaction Factors	Analysis
1	ASSURANCE	The safety and comfort either in the station or train	The customers' perception of Tawang Alun Train is that the safety and the comfort either they are in the station or train is poor, it is because several stations do not have waiting rooms and do not have enough chairs to sit so many passengers wait for the train uncomfortably.
2	EMPHATY	The 24/7 customer service	Not all passengers of Tawang Alun Malang-Bayuwangi Train know and understand how to book ticket online, so the 24/7 customers service needs to be available.
3	TANGIBLES	The air circulation in the train	The service of Indonesian Railway Company nowadays is already good enough and it pays attention to passengers' comfort since in every railway coach has air

No.	Variable	Satisfaction Factors	Analysis
			conditioner. But there is a thing to be noticed including the customers' health whether they have carsick or vomit. This thing can bother the other train passengers because of the smell and since there is an air conditioner in the railway coach, every ventilation or window is closed.

3.2 Customer Satisfaction Index (CSI)

The result of the customer satisfaction index of Tawang Alun-Malang Banyuwangi Train can be seen on this table :

$$CSI = \frac{T}{5Y} x100\%$$

$$CSI = \frac{382{,}39}{5\ x\ 105{,}30} x100\% = 0{,}73\%$$

According to the result of the processing data as well as the analysis of Customer Satisfaction Index, they can be concluded that the overall customers' satisfaction of Tawang Alun Malang-Banyuwangi Train is on the satisfaction assessment with the value of 0.73%. There are several aspects that need to be fixed in order to improve the customers' satisfaction to use Tawang Alun Malang-Banyuwangi Train.

4. Conclusion

Based on the analysis of Importance Performance Analysis (IPA), there are several attributes that needs to be maintained which are the safety and comfort when the passengers are in the station or train, the 24/7 customer service and the air circulation in the train. Related to the comfort and safety in the station, it is better for the station and Indonesian Railway Company to be able to improve the passengers' comfort more including providing the waiting room or chairs for the passengers to wait for their train comfortably and safely. Meanwhile to be able to provide the 24/7 customer service, Indonesian Railway Company and the station staff should promote it more so that the passengers can use the service to buy the train ticket online. Besides that, the company should make a new innovation for the passengers to buy the ticket from the ticket machine in the station. And for the air circulation in the train, the Indonesian Railway Company can add more exhausts in every railway coach to prevent unpleasant moments especially to overcome bad smell.

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Factor Weighting in DRASTIC Modeling for Assessing the Groundwater Vulnerability in Salatiga Groundwater Basin, Central Java Province

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Abstract

The increase in human population as well as area development in Salatiga Groundwater Basin, Central Java Province, will increase the potency of groundwater contamination in that area. Groundwater quality, especially the shallow groundwater, is very vulnerable to the contamination from industrial waste, fertilizer/agricultural waste, and domestic waste. The first step in the conservation of groundwater quality is by conducting the mapping of the groundwater vulnerability zonation against the contamination. The result of this research was groundwater vulnerability map which showed the areas vulnerable to the groundwater contamination. In this study, groundwater vulnerability map was assessed based on the DRASTIC Method and was processed spatially using Geographic Information System. The DRASTIC method is used to assess the level of groundwater vulnerability based on weighting on seven parameters, which are: depth to the water table (D), recharge (R), aquifer material (A), soil media (S), topography (T), impact of vadose zone (I), and hydraulic conductivity (C). The higher the DRASTIC Index will result in the higher vulnerability level of groundwater contamination in that area. The DRASTIC Indexes in the researched area were 85 – 100 (low vulnerability level), 101 -120 (low to moderate vulnerability level), 121 – 140 (moderate vulnerability level), 141 – 150, (moderate to high vulnerability level), and 151 – 159 (high vulnerability level). The output of this study can be used by local authority as a tool for consideration to arrange the policy for sustainable area development, especially the development in an area affecting the quality of Salatiga Groundwater Basin.

Keywords : Groundwater vulnerability; Salatiga; Geographic Information System; DRASTIC index.

1. Introduction

Water on earth, either surface or groundwater, is very sensitive towards the changing in land utilization, especially the groundwater. The freshwater groundwater can be polluted by contaminants from human activity waste. The contaminants can be originated from agricultural, industrial, as well as domestic waste from the human settlement. Therefore, the decreasing quality of groundwater caused by contaminations needed to be urgently treated since almost half of the world‟s populations are still consuming the groundwater for drinking and other activities [1].

Salatiga groundwater basin is mostly located in the KEDUNGSEPUR (Kendal, Ungaran, Semarang, Salatiga, Purwodadi) area, which is one of the eight strategic areas included in the Central Java Province Spatial Plans (Rencana Tata Ruang Wilayah (RTRW)) Number 21 Year 2003 juncto Central Java Province Local Regulation (PERDA) Number 6 Year 2010, regarding the Central Java Province Spatial Plans. This area is planned to be the center of national economic growth for the local income equalization as well as to decrease the economic imbalance [2]. The Salatiga Groundwater Basin Area is also located on the strategic track which connecting the cities of Jogjakarta, Solo, and Semarang (JOGLOSEMAR). The strategic location of the Salatiga Groundwater

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Basin Area will open the opportunities to the development of the area, especially for the agricultural, trade and service, industrial as well as tourism sectors development [3].

The establishment of that strategic area was aimed to create the safe, comfortable, productive, and sustainable area so that the social, economic, and environmental aspects could be harmonized. However, its existence can provoke the uncontrollable population growth and land conversion, and thus will give rise to the environmental issues. As a picture, the land utilization in the City of Salatiga for the five-year range from 2010 to 2014, had undergone settlement sector development (increased for 120,40 Ha), trade sector development (increased for 4,48 Ha), industrial sector development (increased for 14,55 Ha), and non-agricultural area utilization. In general, the alteration of above land utilization was the conversion from non-irrigated agricultural land to mixed plantation land [4]. The alteration of land utilization to support the human activities, such as the settlement and industrial development, the usage of fertilizer for agriculture, the construction of the sanitary landfill, are the potential hazards which can influence the groundwater quality and increase the potency of groundwater contamination [5].

Thus, the assessment of aquifer vulnerability is very crucial to be conducted as the early attempt to protect the quality of groundwater. Zabet (2002) described vulnerability as the aquifer system sensitivity to be deteriorated caused by external influence [6]. The groundwater vulnerability concept is assuming that physical environment has the ability to protect the groundwater against the impact caused by the nature and human activities. The Earth materials can be acted a natural filter for the flowing through contaminants [7,8].

The term „„vulnerability of groundwater to contamination"" was first used by Margat (1968). The groundwater vulnerability is used to the term natural protection against contamination. Groundwater vulnerability to contamination was defined by the National Research Council (1993) as „„the tendency or likelihood for contaminants to reach a specified position in the groundwater system after introduction at some location above the uppermost aquifer"" [9].

Many groundwater vulnerability assessment techniques had been developed in the last few decades, such as overlay and index method, statistics, as well as computer based process. Groundwater vulnerability assessment method used in this study was a DRASTIC Method. The DRASTIC Method is one of the overlay and index methods which can be broadly applied for several aquifers, such as basaltic rock, sedimentary rock, carbonaceous rock, hard rock, and coastal aquifers [1].

The objective of this research was to determine the aquifer vulnerability level against the contamination using the DRASTIC Method as well Geographic Information System to map the contamination-vulnerable areas in Salatiga Groundwater Basin.

2. Study Area

Salatiga groundwater basin is one of 19 groundwater basins across administrative areas regencies / cities in Central Java province. Administratively, most of Salatiga Groundwater Basin is included in the administrative area of Salatiga and Semarang regency as well as a small portion of Boyolali regency. Geographically, Salatiga groundwater basin is located approximately between 110 ° 27'56.81"- 110°32'4.64" East longitude and 7°17'-7°17.23 'South Latitude with an altitude of 220 to 1,450 meters above Mean Sea Level. Salatiga groundwater basin lies mostly in the slopes of Mount Merbabu and small mountains, among others: Gajah Mungkur, Telomoyo, and Payung Rong [10]. The average annual Rainfall of the last 5 years is about 2198.33 mm / year [11, 12, 13].

Aquifer system at this Salatiga groundwater basin is unconfined and confined aquifer. The rocks that make up the unconfined aquifer usually consisting of tuffaceous sandstone originating from volcanic activity of Mount Merbabu. In the southern part of the study area, the depth of the lower unconfined aquifer is at a depth of about 15-20 meters below local ground level surface, ie starting from the slopes of Mount Merbabu up toward the northeast. In the eastern part of the study area, the position of the bottom of the unconfined aquifer reaches a depth of 30 meters below local ground level surface.

The confined aquifer layer is composed of tuffaceous sandstone layers alternating with lahar and lava. Based on observations from some locations of spring, there are aquifer through the cracks. Distribution depth of confined aquifer is generally located at 43 up to 81 meters below local ground level surface on the slopes of Mount Merbabu and increasingly shallow eastward around the District of Wonosegoro. In the northern part of the research area, upper confined aquifer depth ranging from 18 meters below local ground level surface in the Bringin District.

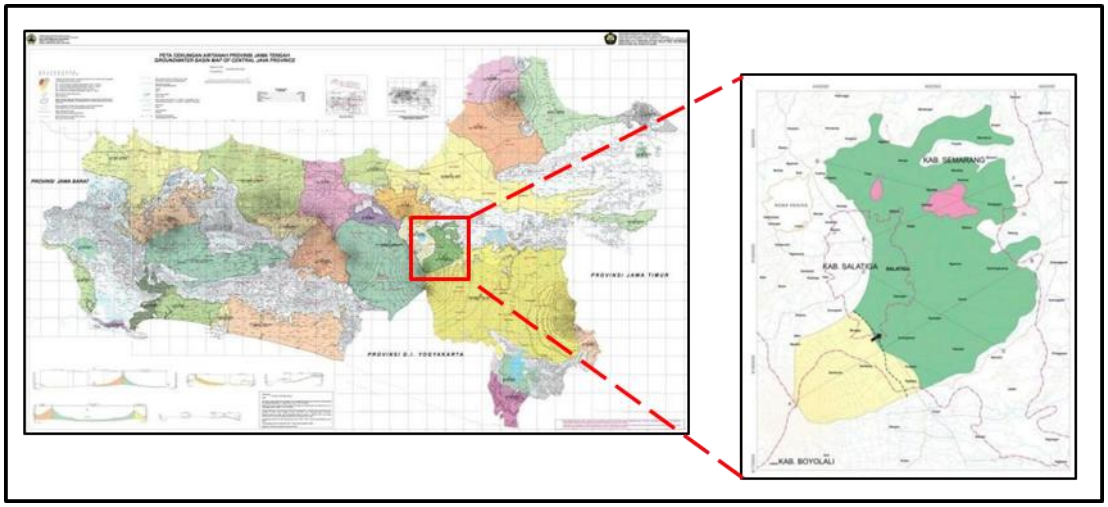

Fig 1. The location of study area.

3. Methodology

The DRASTIC Method of groundwater vulnerability level assessment uses seven parameters, which are: depth to the water table (D), recharge (R), aquifer material (A), soil media (S), topography (T), impact of vadose zone (I), and hydraulic conductivity (C). Depth to the water table data was taken from the depth measurements of the resident"s dug wells in October 2016. Recharge Value was determined by considering the precipitation, evapotranspiration, and runoff levels in studied area between 2011 until
2015. Recharge level was calculated using meteoric water balance analysis. The aquifer materials, soil media, and impact of vadose zone parameters were obtained from the borehole correlation and interpretation log results as well as from geoelectrical survey results data taken from Energy and Mineral Resources Department of Central Java Province [10]. The topography of study area was prepared based on the Shuttle Radar Topographical Mission (SRTM) satellite data. While the hydraulic-conductivity data was obtained from the rock permeability tests in the study area. Each of the DRASTIC Parameters was

weighted according to its level of importance, whereas each of the components from every parameters was rated based of its level of importance. Depth to the water table is weighted 5, recharge is weighted 4, aquifer material is weighted 3, soil media is weighted 2, topography is weighted 1, impact of vadose zone is weighted 5, and hydraulic conductivity is weighted 3. All seven parameters were then converted into digital format via Geographic Information System. By using ArcGIS 10.2, each of the components of the DRASTIC parameters were rated and weighted according to Aller,et.al., 1987 [14].

The next step was to calculate the DRASTIC Index using raster calculator with the formula below:

$$DI = Dr\,Dw + Rr\,Rw + Ar\,Aw + Sr\,Sw + Tr\,Tw + Ir\,Iw + Cr\,Cw \quad (1)$$

with r = rating and w = weight.

The DRASTIC Index were classified into:

Table 1. Vulnerability Ranges Classification [15]

No	Vulnerability Level	DRASTIC Index
1	Very low	< 80
2	Low	80 - 100
3	Low to moderate	101 - 120
4	Moderate	121 - 140
5	Moderate to high	141 - 150
6	High	151 - 180
7	Very high	181 - 200
8	Extremely high	> 200

3. Highlight of research result

In this study, the minimum value of DRASTIC Vulnerability Index in Salatiga Groundwater Basin was 85 – 159. The values of DRASTIC Vulnerability Index were classified into five vulnerability levels, which are: Low (85 – 100), Low to Moderate (101 – 120), Moderate (121 – 140), Moderate to High (141 – 150), and High (151 – 159).

4. Conclusion

Based on the DRASTIC method analysis, the levels of groundwater vulnerability against contamination in Salatiga Groundwater Basin were classified into: Low, Low to Moderate, Moderate, Moderate to High, and High level. The high level of vulnerability zone was found in Pabelan District, Semarang Regency. The main factor affecting the high level of vulnerability zone was the very shallow depth to the water table, which was 0.6 – 1.5 meters depth from the local groundwater surface. The shallow position of groundwater table will cause contaminants to easily reach the groundwater, so that the potency of groundwater contamination in the area will be increased.

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The Relationship Between The Availability Of The Supporting Elements Of The Pedestrian With Pedestrian Crossing Facility Usage Based On User Preferences (Case Study Corridor of Sumbersari Street, Gajayana Street, MT. Haryono Street, Malang City)

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Abstract

Pedestrian crossing facilities are effective enough to avoid pedestrians and vehicles, but its utilization level is still quite low. It indicated that safety is not the only factor that influences a person to make use of pedestrian crossing facilities. In addition the availability of supporting elements of the pedestrian is still scant attention, which is also a factor that raises crossing way reluctant to utilize the crossing facilities are available. Therefore, this research was structured to examine the relationship between the availability of the supporting elements of the pedestrian with pedestrian crossing facility usage based on user preferences. The survey method used in this research in the form of observations and questionnaires on the 211 respondents on the area of the crossing facilities at 3 different locations with the same land use characteristics, whereas the methods of analysis used in this study is the analysis of frequency distribution in order to identify the preferences crossing road towards supporting elements and pedestrian availability factor of utilization of pedestrian crossing facilities. the next method of analysis is the analysis of chi square using SPSS 16 aimed at analyzing the relationship between the availability of the supporting elements of the pedestrian towards the utilization of pedestrian crossing facilities.

Keywords : Pedestrian; Pedestrian Elements; Pedestrian Crossing Facilities

1. Introduction

A pedestrian is a person who performs activities on foot and is one of the elements of road users [1] the term pedestrian or a pedestrian comes from the Greek pedester/pedestris i.e. people who walk or promenade. Pedestrian also comes from the Greek meaning pedos. Pedestrian are also interpreted as movement or circulation or as the destination (destination) on foot (Rubenstein, 1992) [2] . Where a pedestrian is part of the transportation system are no less importance compared to other transportation modes. Although the Act of walking will look simple but it has an important role in the transportation system, because if the pedestrian crash then it will affect parts of the transportation system. Therefore, the needs of pedestrians is a part that is integrated with the transportation system. Results of a study from the Institute of Transportation Studies (INSTRAN) get that 65% of traffic accidents get that traffic accidents result in fatalities are pedestrians [3]. So that it can be understood that the pedestrian facilities are often not included in the planning.

If there are any often do not provide comfort for hikers who use the facility. With the condition plus the facilities inadequate pedestrian often accused one of the causes of traffic congestion. So one of the elements that must be met in the process of engineering traffic is pedestrian facilities (available of pedestrian facility). The importance of the issue of the provision of pedestrian facilities is noteworthy based on the following factors: a). The road plays a role in responding to the problem of urban transportation. b). Pedestrian facilities is an important element in the planning of the city, the pedestrian facilities Set up from a matching vehicle lines would support the potential of the relic in the town center. c). Structuring strategic pedestrian facilities with a high standard of achievement will be able to support the overall circulation in the City Centre (Rhamdani: 1992) [4].

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General conditions on the location of research, the existence of pedestrian crossing facilities are adequate is not followed by the availability of supporting elements of the pedestrian, it still is very minimal which forced the most crossing way to not utilize the facilities of the crossing as well as prefer to cross where it's not supposed to. With the mobility of a high society requires the availability of pedestrian facilities that are equipped with supporting elements to suit preferred factor crossing the road. So the availability of supporting elements of the pedestrian needs to be examined to see the correlation of each element against the factors against factors that more prioritized by crossing road.

2. Methods

Research methods used in this research is quantitative research with the techniques of data collection the survey is carried out by the primary form of observation and questionnaire with the ordinal scale. The sampling technique used was purposive sampling with the total number of respondents on 3 road corridor that is 211 people. By performing a primary survey towards crossing road at the pedestrian crossing facilities area on 3 road corridor. Then the data obtained processed conducted an analysis that is used is the analysis of frequency distribution and analysis of chi square by using SPSS statistics software 16.

3. Results

Based on the results of the analysis of the pedestrian preference that elements of the pedestrian should be available on the area of pedestrian crossing facilities there are 4 elements, namely the availability of sidewalks, street lighting lamps, pedestrian crossing markings facilities, and vegetation that belongs on the category as a whole is a very considered and considered.

Table 1. Analysis Of The Pedestrians Preference Towards The Availability Of Supporting Elements Of The Pedestrian

No.	The Supporting Element Of The Pedestrian	Street Corridor		
		Sumbersari Street	Gajayana Street	MT Haryono Street
1	Availability Of Sidewalks	1	1	1
2	Availability Of Pedestrian Lights	2	2	2
3	Availability Of Street Lighting Lamps	1	2	2
4	Availability Of Stalls Wait	3	3	3
5	Availability Of Pedestrian Crossing Markings Facilities	2	1	1
6	Availability Of Guardrail	2	2	2
7	Availability Of Sign Crossings Facilities	2	2	1
8	Availability Of The Public Telephone	4	5	4
9	Availability Of Vegetation	1	1	1
10	Availability Of The Trash	4	4	2

Description:
1 = Very Considered
2 = Considered
3 = Enough Considered
4 = Less Considered
5 = Not Considered

Based on the results of the analysis of the pedestrian preference that overall belongs in two categories namely very considered and considered. The most dominant factor and very considered consists of 5 main factors i.e. safety factor, safety factor, factor, factor of comfort, ease and smoothness..

Table 2. Analysis Of The Pedestrians Preference Towards The Crossing Facilities Utilization Factor

No.	Crossing Facilities Utilization Factor	Street Corridor		
		Sumbersari Street	Gajayana Street	MT Haryono Street
1	Safety Factor	1	1	2
2	Security Factor	1	1	1
3	Ease Factor	1	2	1
4	Convenience Factor	1	1	1
5	Smooth Factor	1	2	1
6	Integration System Factor	2	2	2
7	Attraction Factor	2	2	2

Description:
1 = Very Considered
2 = Considered
3 = Enough Considered
4 = Less Considered
5 = Not Considered

Based on the results of the analysis of the relationship between the availability of supporting elements with pedestrian crossing facilities utilization by using the chi square analysis. Chi square analysis mathematically can be calculated with the following formula:

$$1.\quad x^2 = \frac{(\sum(fo - fe)^2}{fe} \qquad (1)$$

Where:
x^2 = The value of the Chi Squared
Fe = Frequency expected
fo = Frequency obtained/observed

The chi square test hypotheses with IE:
H_0 = no relationship between availability of the supporting elements of the pedestrian towards the utilization of pedestrian crossing facilities.
H_1 = no relationship between availability of the supporting elements of the pedestrian towards the pedestrian crossing facility factors.
Chi square correlation test with significance level of 0.05 as follows:
If *Asymp. Sig* > 0.05 then H_0 is received
If *Asymp. Sig* < 0.05 then H_0 is rejected

Table 3. The Chi Square Test results Correlation Between Availability of The Supporting Elements Of The Pedestrian Facility Usage Factor Towards The Pedestrian Crossing

The Level Of Significance 5% (0.05)	Factor In The Utilization Of Pedestrian Crossing Facilities						
The Supporting Element Of The Pedestrian	Safety Factor	Security Factor	Ease Factor	Convenience Factor	Smooth Factor	Integration System Factor	Attraction Factor
Availability Of Sidewalks	0.373	0.563	0.020	0.095	0.000	0.775	0.062
Availability Of Pedestrian Lights	0.916	0.902	0.020	0.490	0.199	0.010	0.546
Availability Of Street Lighting Lamps	0.712	0037	0.205	0.081	0.673	0.927	0.004
Availability Of Stalls Wait	0.522	0.072	0.467	0.997	0.736	0.185	0.786

The Level Of Significance 5% (0.05)	Factor In The Utilization Of Pedestrian Crossing Facilities						
The Supporting Element Of The Pedestrian	Safety Factor	Security Factor	Ease Factor	Convenience Factor	Smooth Factor	Integration System Factor	Attraction Factor
Availability Of Pedestrian Crossing Markings Facilities	0.206	0.225	0.017	0.824	0.054	0.989	0.791
Availability Of Guardrail	0.096	0.424	0.675	0.230	0.860	0.247	0.872
Availability Of Sign Crossings Facilities	0.001	0.082	0.567	0.927	0.571	0.840	0.635
Availability Of The Public Telephone	0.195	0.205	0.987	0.607	0.533	0.968	0.835
Availability Of Vegetation	0.537	0.581	0.327	0.033	0.156	0.707	0.379
Availability Of The Trash	0.896	0.892	0.946	0.404	0.633	0.721	0.038

Description:

= Have a correlation (significance level 5% </< 0.05)

= Do not have a correlation (the level of significance of 5% >/> 0.05)

Based on Chi square analysis the results it can be concluded that there is some element of the pedestrian have a correlation towards utilization of pedestrian crossing facilities.

a. Availability of sign crossings facilities have a correlation with safety factor by significance of 0.001.
b. Availability of street lighting lamps have a correlation with security factor by significance of 0.037.
c. Availability of sidewalks, pedestrian light availability, and the availability of pedestrian crossing markings facilities have the correlation with ease factor by significance of 0.020 0.020,, and 0.017.
d. Availability of vegetation have a correlation with convenience factor by significance of 0.033.
e. Availability of sidewalks have correlation with smooth factor by significance of 0.000.
f. Availability of pedestrian lights have a correlation with integration system factor by significance of 0.010.
g. Availability of street lighting lamps and trash have a correlation with attraction factor by significance levels of 0.004, 0.038.

4. Conclusion

Based on the preferences of the crossing the way that supporting elements of the pedestrian should be available on the area of pedestrian crossing facilities there are 4 elements, consist of the availability of sidewalks, street lighting lamps, pedestrian crossing markings facilities, and vegetation. While the pedestrians preference towards the utilization factor of pedestrian crossing facilities as a whole belongs in two categories namely very considered and considered. The most dominant factor and very considered consists of 5 main factors, consist of. safety factor, security factor, ease factor, factor of comfort, and smoothness factor. As for chi square correlation test between the supporting elements of the pedestrian with the pedestrian crossing facility usage is:

a. The availability of sign crossings facilities have a correlation towards safety factor.
b. The availability of street lighting lamps have a correlation towards security factor.
c. The availability of sidewalks, pedestrian light availability, and the availability of pedestrian crossing markings facilities have the correlation ease factor.
d. The availability of vegetation have a correlation towards convenience factor.
e. The availability of sidewalks have a correlation towards smooth factor.
f. The availability of pedestrian lights have a correlation towards integration system factor.
g. The availability of street lighting lamps and trash have a correlation towards attraction factor.

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The Difference in The Level Of Co_2 Emissions from The Transport Sector on Weekdays and Weekends on The City Center of Pemalang

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Abstract

The high growth of human activity in potentially increases the number of vehicles and the use of fossil fuels that contribute to increase CO_2 emissions in the atmosphere. Controlling CO_2 emission that cause greenhouse effect becomes the main agenda. The first step to controll CO_2 emissions is by measuring the level of CO_2 emissions, which is the CO_2 emissions from fossil fuel consumption on transport sector. This research aims to assess the level of CO_2 emissions from the transport sector on the main roads in the city center of Pemalang both in week day and week end.. The methods used in calculation CO_2 emissions using Intergovermental Panel On Climate Change (IPCC) 2006 method by first doing a survey on the number of vehicles passing through the main roads using hand tally counter. Based on the results of the data processing, CO_2 emissions in working day i.e. 49,006.95 tonnes/year compared to weekend i.e. 38,865.50 tonnes/year

Keywords : CO_2 Emission; Transportation.

1. Introduction

The high growth of people in a region is the early emergence of environmental problem due to the increased variety of human needs [1]. Population growth requires new residential developments in the suburbs. The development of the settlement which today is far from community activities to encourage people to find a mode of transportation. Transportation required in support of the activities of the community everyday. Transportation is an important means for the community both in the community and facilitate mobility as well as goods. The transport needs of the community will encourage people in the purchase of the vehicle in particular motor vehicles. This has resulted in an increasing number of motor vehicles and as well as increased emissions of gasses such as CO2 as a b-product of combustion of fossil fuels used by motor vehicles. The level of concentration of CO2 gas emissions that exceeded the normal limit may negatively impact humans and the environment. Despite the use of motor vehicles resulting in increased fuel usage so that gas emissions containing pollutants will also increase. The use of motor vehicles by people on weekdays and weekend will be different to affect the magnitude of the emissions of CO2 are produced and released into the environment.

The growth of the city center of Pemalang became the center of trade, services, education, offices and health services enables an increasing number of vehicles on some streets in the city center of Pemalang and increased energy consumption as a consequence of the rapid growth of the city is the increased mobility of the population, either in the city or between city. A growing number of private two wheel vehicle, three wheel and four wheel are hard to avoid. Procurement and distribution of gasoline in the city of Pemalang have increased more or less by 2.32%, whereas solar procurement experience an increase of 3.65%[2]. Most of the sources of energy used comes from fossil fuels. The use of fossil fuels results in the occurrence of air pollution due to some major pollutant derived from fossil fuel use[1], [3]. The largest fossil fuel consumption in the city of Pemalang comes from the transport sector and the sector is contributing the biggest polluters as it does occur in large cities such as occurs in large cities. Research conducted by the Soehodho mention that transportation accounts for 70% of total pollutants that enter the atmosphere in Jakarta[4].

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Therefore, the study of inventory of CO2 emissions is done to inventory emissions of CO2 in transport sector in Pemalang on 1 (one) working day and 1 (one) day off to know how big a difference levels of emissions caused by motor vehicles at the time of working day and weekend.

2. Literature Review

2.1. Air Pollution Resources

Sources of air pollution come from natural resources and the result of human activity (anthropogenic) such as fuel combustion in transportation, power plants and use of boilers in the industry[5], [6]. The largest anthropogenic resources that cause air pollution comes from transportation activities.

2.2. Emission from Vehicles

The air in the atmosphere under normal conditions the gas mixture is composed of 78% nitrogen, 20% oxygen, 0.93% argon, 0.03% carbon dioxide and the rest consists of neon, helium, methane, and hydrogen. The condition of the air in the atmosphere can be said to be contaminated when changing the composition of the air. Changes in the composition of the incoming air can occur due to or inclusion of substances, energy and/or other components resulting from an activity that is potentially as polluters[7]. The main pollutants produced by motor vehicles which can cause air pollution, among others, dust, carbon monoxide, carbon dioxide, hydrocarbons, nitrogen oxides and sulfur oxides [1], [3]. The resulting carbon emissions from motor vehicles is one of the causes of global warming because most emissions contribute to global warming is carbon dioxide (CO2) besides methane (CH4), dinitro oxide (N2O), perflourcarbon (PFC), hidrofloroucarbon (HFC), and sulfurhexaflourida (SF6). According to the United Nations Framework Convention On Climate Change in addition to the six types of greenhouse gases, there are some gases also enter into the greenhouse gases includie carbon monoxide (CO), nitrogen oxides (NOx), chlorofluorocarbon (CFC) and gas - gas metal organic non other volatiles.

Three main types of gas that most so-called greenhouse gases are CO2, CH4, N2O, because it is considered as a gas layer which acts as a trap heat wave and the end - the end concentration in the atmosphere continue to rise until doubled [8]. Based on calculations in the last few years, the CO2 contribution towards global warming reached more than 60%. CO2 emissions increase, amounting to 27.0 billion tons of CO2 in 2004 or average increased by 1.6% per year. Contributor to CO2 emissions are spread is the United States (21.9% of total world CO2 emissions), followed by China (17.4%), India (4.1%). While Indonesia accounted for emissions of 1.2%. The main source of CO2 emissions comes from fossil fuel use (74% of total emissions in the world), followed by a land convention (24%) and the cement industry (3%)[9].

2.3 Calculation of CO_2 Emissions

Method for calculating CO2 emissions is very diverse and constantly evolving but the calculation of the CO2 emissions that were used by the Government of Indonesia refers to a method of the Inter-governmental Panel on Climate Change. The analytical calculation of the CO2 emissions calculated based on emission factors or the coefficients of fuel types used to then multiply by the amount of fuel consumption in accordance with the method of mathematical calculations the IPCC 2006 Guidelines. The basic model calculations of GHG emissions as follows [10] :

$$GHG\ Emissions = Activity\ Data \times Emission\ Factor \quad (1)$$

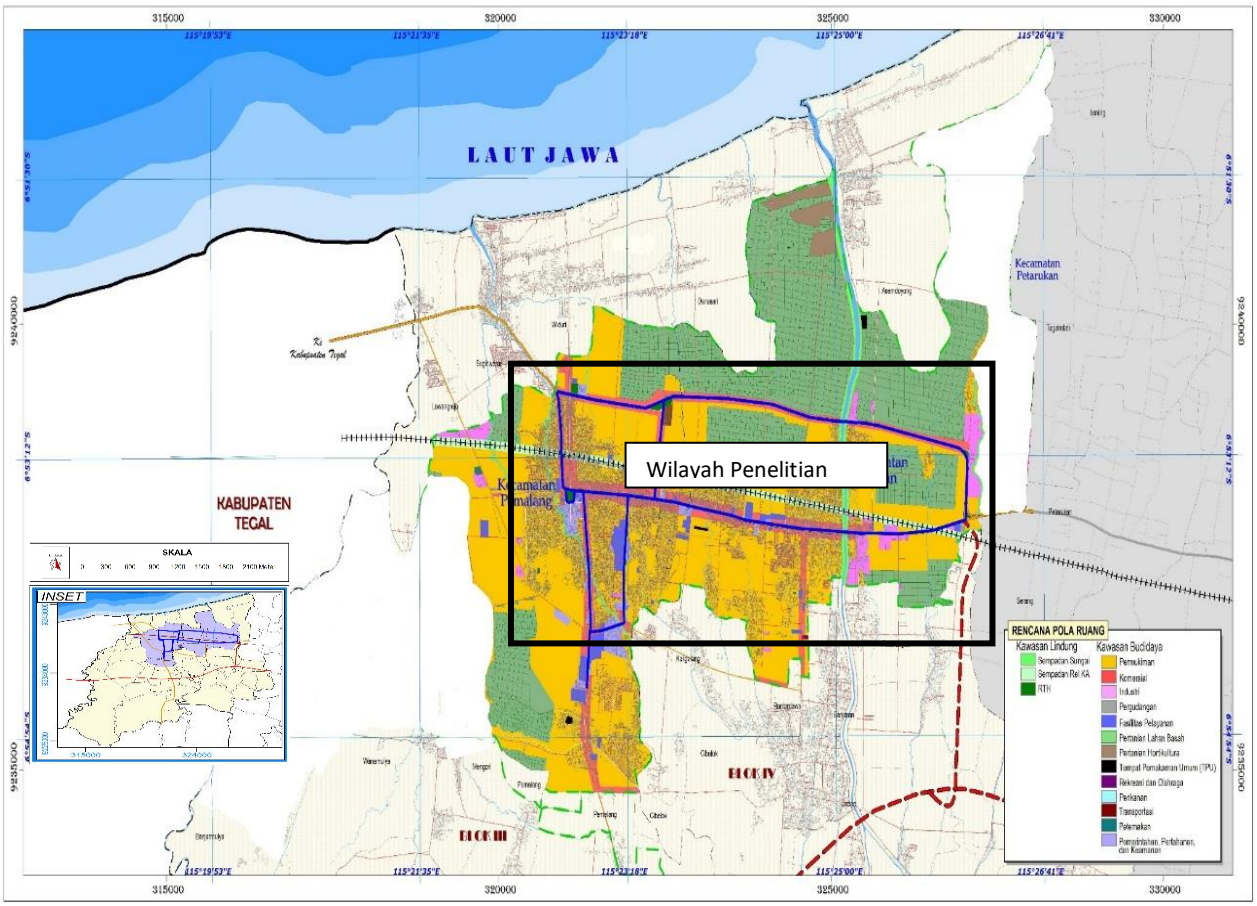
GHG Emissions	:	Total GHG Emissions
Activity Data	:	The quantitative magnitudes of human activity or activities that can release and/or absorb GHG
Emissions Factor	:	A quantity that indicates the amount of GHG emissions that would be released from a specific activity.

Data activity in equation 1 is the abundance of fuel consumption or the consumption of energy by vehicles passing through a road section, in this case the energy consumption is converted first into units energy Terra Joule (tj) with the formula :

Energy Consumption (tj) = Energy Consumptions (ltr/km) x Number of vehicles x Length of road (km) x Heat value (tj/ltr) (2)

3. Methods

An inventory study of CO2 emissions from the transport sector this is done through a quantitative methodology where traffic volume is obtained through direct measurement (traffic counting) in 11 (eleven) of the main roads in the city center of Pemalang based on Survey guidelines for counting traffic by manual, Number: Pd, T-19-2004-B using a hand tally counter. Selection of the city center of Pemalang as a location because it's the center of trade, services, education, offices and health service. The kind of vehicles that surveyed were differentiated into 3 main types of motorcycle, light vehicles and heavy vehicles. Survey on the volume of traffic on the roads done the 12 hours on 1 (one) working day (weekday) and 1 (one) holidays (weekend) which is divided into three periods of time in the morning peak hours (6:00 to 10:00 a.m.), during peak hours (11:00 a.m. to 3:00 p.m.) and afternoon peak hours (4:00 p.m. to 8:00 p.m.).



Picture 1. Location research
Source : Bappeda Kab. Pemalang

4. Results

4.1. Data Traffic Volume

Traffic volume retrieved from results of traffic counting is served in units of passenger cars by means of multiplying the value of passenger car euivalent (emp) with the existing traffic volume. The value of the emp to light vehicles is equal to 1, the value of the emp to motorcycle equals 0.25 and emp for heavy vehicles euals 1.2[11]. The value of the emp is not the same as each vehicle types have different characteristics.

Based on the results of the traffic enumeration in 11 (eleven) of roads during the twelve (12) hours, the vehicles dominate on weekdays and holidays is a motorcycle, followed respectively by car, pick-up/small trucks, freight/small buses and large trucks/buses are great. The total volume of the vehicle after being converted into a passenger car unit on weekdays at 10,637.27 smp/hour while on holiday at 8,855.86 smp/hour.

4.2. CO2 Emissions

Calculation of CO2 emissions in this study refers to a method of the Inter-govermental Panel on Climate Change (IPCC) in 2006. Heat value used for calculation of the heat value of using premium fuel and diesel fuel for transport activities i.e. amounting to 33 x 10-6 for premium fuel and 36 x 10-6 for diesel fuel[12]. The value of energy consumption for motorcycle of 0.04 liters/km, light vehicle of 0.11 liters/km for premium fuel and 0.17 liters/km for diesel fuel, and heavy vehicle of 0.25 liters/km[13]. While the emission factor for gasoline amounted to 69,300 kg CO2/tj and 74,100 kg CO2/TJ for diesel[14].

Based on the results of the calculation of the CO2 emissions, on working days amounted to 5,594.40 kg/hour or 49,006.95 tons/year of CO2 emissions while on weekend 4,436.70 kg/hour or 38,865.50 ton/year with the largets emissions of contributors is light vehicles followed by heavy vehicles later motorcycles. On working days, the percentage of light vehicles accounted for 54.27% of total emissions generated while on weekend, light vehicles accounted for the percentage of 59.56% of the total emissions generated.

Table 1. The Result of the Calculation of the Emissions of CO2 from Motor Vehicles On the Main Roads in the City Center of Pemalang

No	Street Name	Long road [km]	Working Day [ton/th]				Weekend [ton/th]			
			MC	LV	HV	Total	MC	LV	HV	Total
1	Jend. Sudirman	3,56	1912,16	5758,23	76,95	7.747,35	1554,92	5055,72	60,31	6.670,95
2	Ahmad Yani	1,60	437,37	1325,33	24,30	1.787,00	402,37	1166,74	12,15	1.581,27
3	Pemuda	1,70	667,03	1355,07	13,90	2.036,00	504,21	1294,30	12,91	1.811,42
4	Perintis Kemerdekaan	2,26	1153,31	4263,39	219,17	5.635,87	940,29	3564,80	66,02	4.571,10
5	Urip Sumoharjo	1,19	334,31	893,50	13,21	1.241,02	262,06	769,58	5,56	1.037,20
6	Moch. Yamin	1,58	124,53	2994,69	6271,15	9.390,37	109,57	2706,30	4033,70	6.849,57
7	Letjend. Suprapto	2,66	165,90	4090,48	9219,79	13.476,17	129,67	3398,16	6243,91	9.771,73
8	Slamet Riyadi	1,20	219,72	716,75	4,21	940,68	167,96	627,35	3,51	798,81
9	Jend. Gatot Subroto	1,36	651,39	2469,53	100,90	3.221,83	510,46	2148,21	55,62	2.714,29
10	Mochtar	1,00	432,32	1417,23	19,28	1.868,83	347,61	1231,80	7,59	1.587,00
11	Dr. Cipto Mangunkusumo	1,30	330,73	1311,36	19,75	1.661,84	273,65	1184,84	13,67	1.472,16

Source : The calculation results.

5. Conclusion

The levels of CO2 emissions generated by motor vehicles at 11 (eleven) roads of Pemalang City on working days larger than weekend. Based on the results of the calculation of the CO2 gas emissions, on working days amounted to 5,594.40 kg/hour or 49,006.95 tons/year of CO2 emissions while on weekend 4,436.70 kg/hour or 38,865.50 ton/year.

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Sustainability Study of Domestic Wastewater Treatment Communal in Surabaya City

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Abstract

Sanitation is one of the critical infrastructure sectors in order to improve community health status. The Ministry of Public Works of the Republic of Indonesia to define that word sanitation include: domestic waste water management, solid waste management, rain water management (drainage management) as well as the provision of clean water. Surabaya city as the capital of East Java province and Indonesia's second largest city with a population of 2,853,661 inhabitants in 2014 (the second largest after Jakarta), but the people who have been served by the sanitation infrastructure systems were expected at 176,105 families or about 26.95 % of the population of the city is already using sanitation facilities. In the White Book Sanitation of Surabaya City in 2010, Surabaya City sanitation development mission is to realize the wastewater management of settlements in a sustainable and affordable by the community.This study aims to assess the sustainability of the wastewater treatment plant (WWTP) domestic communal in the city of Surabaya. The method in this research is quantitative method through observation, structured interviews and laboratory testing of the variables analyzed. Analyses were performed using a technique Multidisciplinary rapid appraisal (Rapfish) to determine the level of sustainability of the management of communal WWTP based on a number of attributes that easy scored. Attributes of each dimension includes the technical, environmental quality, institutional, economic, and social. The results of further studies are grouped in the index from 0.00 to 25.00 (unsustainable), from 25.01 to 50.00 (less sustainable), from 50.01 to 75.00 (fairly sustainable), and 75.01 to 100.00 (highly sustainable). The objective of this research is expected to provide an overview of the sustainability of domestic WWTP communal current to be used as reference in the development of a kind of future for local government.

Keywords : sustainability; wastewater treatment plants; communal; Rapfish; Surabaya

1. Introduction

Today there are many people in Indonesia who have difficulty accessing clean water and sanitation due to the limitations of the existing infrastructure. In accordance with the Millennium Development Goals (MDGs), the Government has set a target in 2015 that as many as 68.87% of the total Indonesian population should have access to improved drinking water sources, while access to adequate sanitation facilities is as much as 62.41% [1]. Based on data from the Central Statistics Agency (BPS), for the period 2011 to 2014 Q1, the proportion of households to sanitation is 61.04% for basic sanitation in urban and rural areas. But it is merely a quantity not quality. When viewed from the quality is still 51.02% of the families in Indonesia have access to improved sanitation [2]. Report of the Health Research Ministry of Health in 2013 showed that the proportion of households with access to improved sanitation facilities in Indonesia in 2013 amounted to 59.8 percent. When compared with the results Riskesdas 2007 and 2010, the proportion of households Indonesia have access to improved sanitation facilities tend to increase (2007: 40.3%; 2010: 51.5%; 2013: 59.8%).

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In urban areas easily seen their means of wastewater that flowed through the channels, where wastewater from the household immediately flowed into channels in the area around the settlements to the water bodies nearby creeks and rivers. Besides flowed into the channels that exist, there is an approach to business processing household waste water is to use a communal domestic WWTP. More and more domestic communal WWTP that creates a variety of problems associated with sustainability, because during this time the concept of management of communal WWTP less domestically involving all stakeholders and not be seen from various aspects. Under these conditions certainly needed a study to formulate the concept of effective management to achieve sustainability of domestic WWTP communal [3].

Surabaya city as the capital of East Java province and Indonesia's second largest city, and the city is quite important in eastern Indonesia continues to experience population growth, and to experience growth in population lifestyles. Based on the report Surabaya in Figures 2015 published by BPS Surabaya, Surabaya total population reached 2,853,661 inhabitants in 2014 (the second largest after Jakarta). The population is so big no wonder the Surabaya City development results in more buildings for the centers to attract people outside the city of Surabaya to enter and stay in the city of Surabaya well as seasonal residents and permanent residents. Population growth demanded accretion residences, ranging from the very simple, which is in river side or channel up to luxurious. Urban development is not integrated with the surrounding area will pose complex problems such as environmental health problems, pollution, water supply and disposal of domestic waste.

Systems and conditions of the disposal of domestic wastewater in the city of Surabaya, based oninformation from Surabaya City Health Office, the conditions and the level of sanitation services related to the problem of sewerage in the city of Surabaya is still less qualified technical and health. Some locations have supplied domestic wastewater disposal facilities, but there are some that can't be used anymore. This is due to lack of awarenes s of society to live a healthy life as well as the cost factor for the operation and maintenance of sanitation facilities. Based on number examined in each health center can be concluded that, people who have been served by the sanitation infrastructure systems were expected to total 176,105 households, or about 26, 95% of the population of the city is already using sanitation facilities. Therefore we need an assessment of the sustainability of wastewater management in particular settlements WWTP domestic communal in Surabaya who can provide fill to related parties.

2. Methods

In analyzing the sustainability of one of the methods used are Rapid Appraisal for Fisheries (Rapfish) is a technique for assessing the sustainability of fisheries using a number of attributes that are multidisciplinary to evaluate the comparative sustainability based on various dimensions revealed to be a number of attributes/indicators to be done scoring [4]. Rapfish used in calculating the sustainability of communal WWTP, is a modification of Rapfish developed by the University of British Columbia, Canada and used to assess the sustainability fishing. Sustainability status assessment using software techniques rapfish with Multi Dimensional Scaling (MDS), which has many advantages, including a simple, easily valued, fast and cost required relatively inexpensive. In addition, this technique may explain the relationship of the various aspects of sustainability and also defines a flexible regional development [5].

According to (Balkema et al, 2002), indicators of sustainable development criteria of domestic waste water management includes several things including technology, financing, institutional, community and the environment[6]. Rapfish modified are used to determine the level of sustainability of the management of communal WWTP based on a number of attributes that easy scored. Attributes or indicators of any dimension or variable (technical, environmental quality, institutional, economic, and social) will be evaluated and may be selected to reflect sustainability, and can be fixed or can be replaced when the latest information was obtained. Attributes in the technical aspects include the physical condition of the WWTP, the suitability of the location of the WWTP with the planning, the production capacity of the WWTP and the removal efficiency of contaminants. Attributes in environmental quality aspects seen from the WWTP effluent parameters on the fulfillment of quality standards by East Java Governor Regulation No. 72 Year 2013, namely the parameters pH, BOD5,COD, TSS and Oils Fats. Attributes in the institutional aspects include local institutions, the role of government and regulations. Attributes in the economic aspects include physical construction costs and operating and maintenance costs. Attributes include participation in social aspects and public perception. An assessment of the attributes of each dimension is done through observation, literature studies, laboratory tests and the results of the questionnaire. Examples of attributes on a technical dimension and weight criteria of assessment can be seen in Table 1.

Table 1. DimensIons And Attributes WWTP SUsTainability AsSEsSMent Communal

Dimension / Attributes	Low	High	Criteria
Technical			
Physical Condition	1	3	(1) not according to plan (2) according to plan but a lot of mistakes (3) in the planning horizon
Conformity Layout	1	3	(1) not according to plan without explanation (2) does not fit no explanation planning (3) appropriate planning
Capacity	1	3	(1) 0-50% of inflow planning (2) 51-99% inflow planning (3) debit entry according to plan
Efficiency	1	2	(1) not according to plan (2) based on planning

Whereas in determining the sustainability status communal WWTP use categories as submitted by (Suyitman et al, 2009). Tabulation category communal WWTP sustainability are presented in Table 1[7].

Table 1. Category Status Assessment Communal WWTP Sustainability

Index Value	Category
0,00-25,00	unsustainable
25,01-50,00	less sustainable
50,01-75,00	fairly sustainable
75,01-100,00	highly sustainable

3. Results

The study on the sustainability of wastewater domestic communal in the city of Surabaya was conducted in three (3) locations ; WWTP Sawahan located in the central region of Surabaya, WWTP Krembangan located in the northern city of Surabaya and WWTP Penjaringan Sari located in the southern region of the city of Surabaya. Based on the analysis in the form of scoring against the attributes of each dimension (technical, environmental quality, institutional, economic, and social) will be grouped into the index are grouped in the index from 0.00 to 25.00 (unsustainable), from 25.01 to 50.00 (less sustainable), from 50.01 to 75.00 (fairly sustainable), and 75.01 to 100.00 (highly sustainable)[7]. The results of the analysis then poured in the diagram overpass , so the status of the WWTP sustainability of each dimension can be seen easily as in Figure 1.

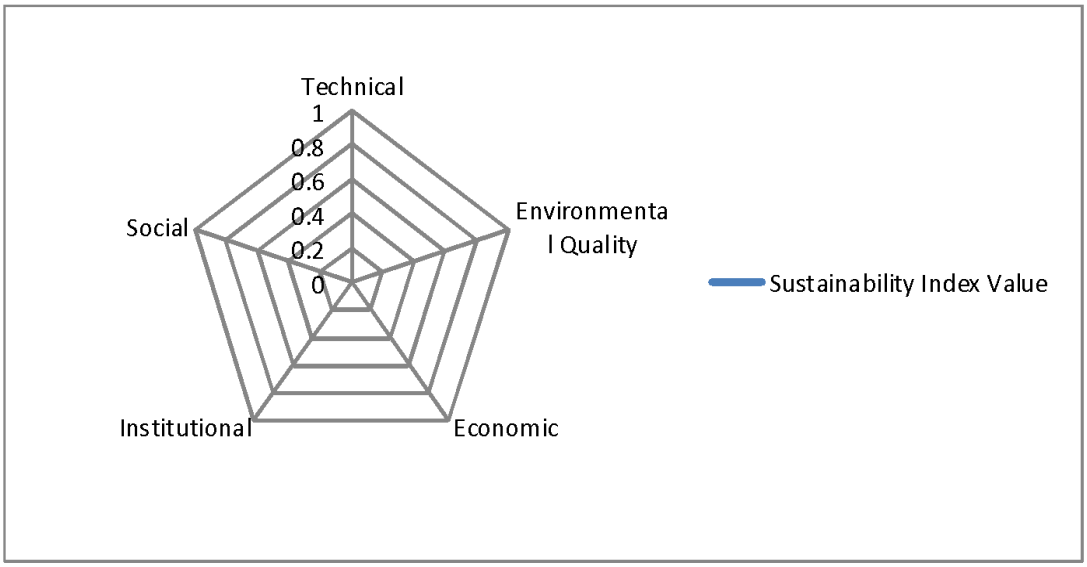

Fig 1. Kite diagram of WWTP sustainability index

4. Conclusion

Based on the analysis method Rapfish, the sustainability status of communal domestic WWTP in Surabaya can be grouped into the index between 0.00 to 100.00 by the sustainable status between unsustainable, less s ustainable, fairly s ustainable and highly s ustainable. So the res ults of this s tudy are expected to provide an overview of the s ustainability of domes tic WWTP communal current to be referenced in the kind of future development for parties involved.

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Potential Air Pollutant Emission from Private Vehicles Based on Vehicle Route

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Abstract

Air emission related to transportation sector have been positioned for second largest emitter in Indonesia. This due to large number of private vehicles commute in the city as well as inter city. Questionnaire survey was conducted in Semarang city for 711 private vehicles consist of cars and motorcycles. The survey was done on the parking lot randomly across Semarang districts and on the vehicle workshops. Based on parking lot survey, the average Vehicles Kilometers Travelled for private cars were 17.737 km/year with number startup during weekdays and weekend were on average 5.19 and 3.79 respectively. While for motorcycle the average of Vehicles Kilometers Travelled were 27.092 km/year with number startup during weekdays and weekend were on average 5.84 and 3.98 times respectively. While vehicle workshops survey showed the average of Vehicles Kilometers Travelled were 9.510 km/year while for private car the average of Vehicles Kilometers Travelled were 21.347 km/year. The odomoter reading for private cars on maximum is 3.046.509 km with minimum 700 km. Meanwhile for motorcycle the odometer reading showed on maximum 973.164 km with minimum about 54.24 km. Air pollutants emission on East-West routes were generally higher than those on South-North routes.

Keywords: emission ; route ; Semarang; transportation; VKT

1. Introduction

Conventional air pollutants and enormous major greenhouse gases (GHGs) in the atmosphere are originated from transportation sector i.e vehicles emission [1]. The major GHGs are carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). From previous study, large percentage of urban transport contribution is extremely high. Factors affect the magnitude of air pollutants are, but not limited to, engine combustion technology, sort-quality of consumed fuel, exhaust device control, sort of road surface-terrain and vehicle operation (driver behavior).

Up to now, assessing air quality in specific area highly requires vehicle population estimation [2]. Thus identify recent and including detailed fleet being investigated is indispensable. Yet, for detailed source inventory, it needs robust and detailed statistical data featuring various vehicle categories and their specific operating conditions [3]. The vehicle routes is important to determine the real emission due to travelled vehicles. Usually the more flat terrain will produce higher speed, however it may not true if we consider the traffic volume also. Thus in this study, we will find the different air pollutant emission due to travelled car/motorcycle at different routes.

Appropriate measures for abating the air emission related to transportation sector have been adopted in Indonesia. Several measures that already implemented in recent years for managing transport sector and has co-benefit in pollution reduction. These policies including application of Intelligent Transportation System (ITS), implementing Traffic Impact Control, introducing Bus Rapid Transport (BRT) system, developing non motorized transport, renewing paratransit public transportation and introducing smart driving training. All of these measures are implemented initially in big cities and claimed for air pollutants as well as GHGs reduction. However, such policies lack of supporting data to calculate hypothetical reduction. For example on ITS application how much vehicle speed before and after deploying ITS devices, how much shifting of private vehicles to pedestrian in NMT program , how much shifting mode of private vehicles to BRT system in BRT system program. Hence there are many research to be

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applied to reveal such data so as to better calculate potential emission reduction. Ministry of Transportation needs this sort of data to complete their data for calculating emission reduction efforts..

2. Methodology

2.1 Parking lot survey

Questionnaires survey has been conducted to get the data for technology distribution in vehicle fleet in Semarang. Total number of questionnaires of 1,150 has been collected for survey including for public transport (taxis, buses, paratransit), however only private vehicles are highlighted in this study. Semarang consists of 16 sub-districts (kecamatan) and 10 city zone (Bagian Wilayah Kota, BWK). City center is concentrated in Semarang Utara (North), Semarang Tengah (Central), Semarang Barat (West) and Semarang Selatan (South). Number of registered vehicle for each district was used to allocate the number of questionnaires for each type of vehicle.

2.2 Motorcycle and Car Workshop survey

Along with parking lot survey, we did car and motorcycle workshop survey to know the regular maintenance figure. In this survey we delivered 94 survey for motorcycle and 73 survey for personal car.

2.3 GPS Survey

The GlobalSat DG-100 GPS Data Logger will be used for monitoring. The DG-100 GPS will record time, traveling speed, altitude and location of each monitored vehicle at second by second basis. The output information of GPS monitoring will be driving pattern of vehicle (include start/stop time and speed) and travel route location. In this study, GPS monitoring will be done only for private car.

2.4 Emission Factor

Combination of emission factor was used to quantify the emission. There is no single reference which is able to give complete emission factor for the land transportation. Also local emission factor was not identified in this study. List of emission factor used in this study is depicted in the following table.

Table 1.Emission Factor Used in This Study

Fuel	Pollutant						
	TSP (g/kg) (a)	NOx (g/kg) (a)	CO (g/kg) (a)	HC (g/mile) (b)	CO2 (g/TJ) (c)	CH4 (g/TJ) (c)	N2O (g/TJ) (c)
Gasoline	0.03	8.73	84.7	0.184	69.3	0.033	0.0032
Diesel	1.1	12.96	3.33	0.29	74.1	0.0039	0.003

(a) CORINAIR (2009) (b) US EPA 1997 © IPCC 2006

3. Results

The survey was done on the parking lot randomly across Semarang districts. Average Vehicles Kilometers Travelled for private cars were 17.737 km/year with number startup during weekdays and weekend were on average 5.19 and 3.79 respectively. While for motorcycle the average of Vehicles Kilometers Travelled were 27.092 km/year with number startup during weekdays and weekend were on average 5.84 and 3.98 times respectively. The odomoter reading for private cars on maximum is 3.046.509 km with minimum 700 km. Meanwhile for motorcycle the odometer reading showed on maximum 973.164 km with minimum about 54.24 km

Based on survey at the workshop for motorcycle the average of Vehicles Kilometers Travelled were 9.510 km/year while for private car the average of Vehicles Kilometers Travelled were 21.347 km/year. The difference of VKT from parking lot survey and workshop survey might be the distribution of vehicle age is quite different. In the workshop relatively new vehicles (< 5 years) were identified.

Semarang city has a complex terrain in which South-North route has significant different at their altitude (about 300 m height) while East-West route has relatively flat terrain. The example of the relation of vehicle speed based on routes during morning could be seen in the following figure.

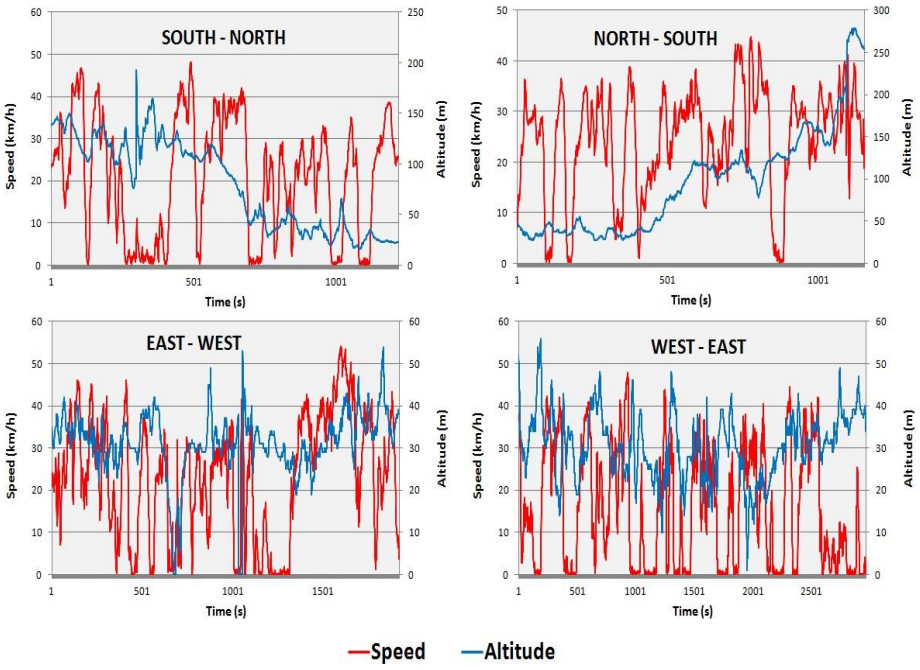


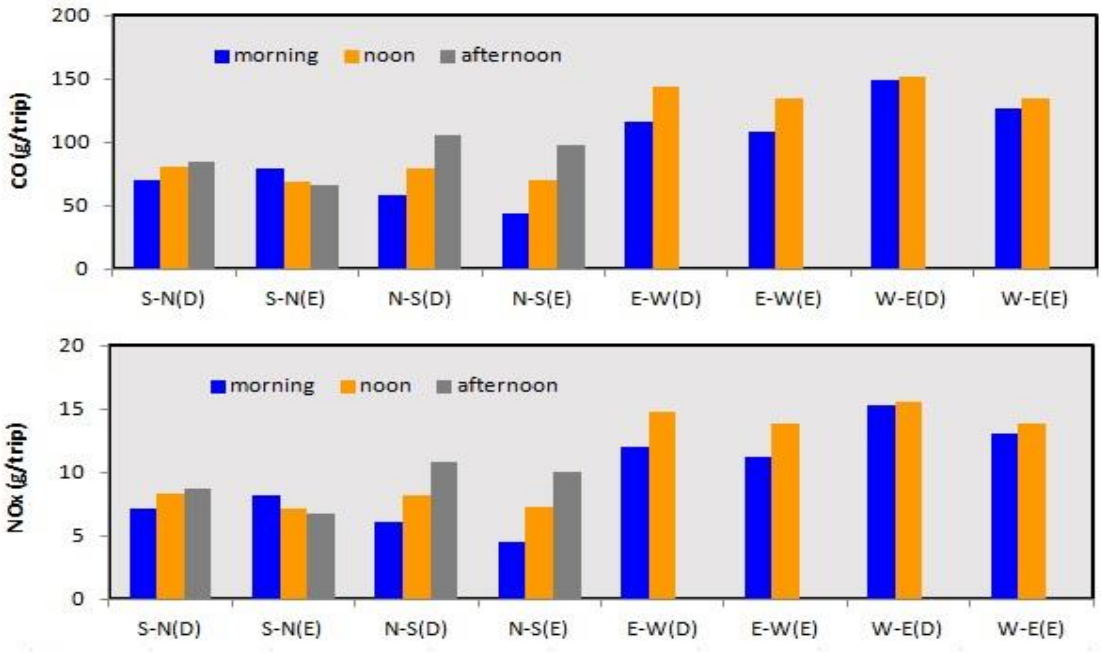
Figure 1. The Vehicle Speed vs Altitude Based on Routes

The vehicle speeds occasionally drop to almost zero, indicating there is traffic jam (because this figure represent for morning situation). In general the speed of the vehicle were under 50 km/h and very rare the speed exceed 50 km/h. It is hard to reach at this speed due to there were severe congestion during rush hour in the morning. Thus implementation of public transport system in Semarang is indispensable. The fuel consumption for all routes could be summarized in the following table.

Table 2. Fuel Consumption Estimation During Private Car Travelled (L/trip)

Route	Morning	Noon	Afternoon	Morning	Noon	Afternoon
South - North	1.34	1.16	1.11	1.17	1.35	1.42
North-South	0.72	1.18	1.65	0.99	1.34	1.78
East - West	1.83	2.28	n.a	1.96	2.42	n.a
West - East	2.15	2.28	n.a	2.51	2.56	n.a

However in general the air emission which relates to vehicle speed showed that the East-West route has bigger air pollutants emission both in the morning and at noon than those at South-North route (see Figure 1 below). Slower speed at East West route due to higher traffic volume might be the reason of this issue. At noon generally produces higher emission than in the morning might be caused by simultaneously use of private car for day activities such as lunch, relax and meeting. During afternoon generally the pollutant emission showed higher than emission in the morning.



S: South, N: North, W:West, E: East, (D): Weekday, (E): Weekend

Figure.2 Air Pollutants Emission (CO and NOx) at Two Routes

4. Conclusion

Air pollutant emission related to transportation sector in Semarang city will be higher by time in the near future due to large number of private vehicles commute in the city as well as inter-city. Based on parking lot survey, the average VKT for private cars were 17.737 km/year while for motorcycle the average of VKT were 27.092 km/year. Meanwhile vehicle workshops survey showed the average VKT were 9.510 km/year while for private car the average VKT were 21.347 km/year. Air pollutants emission on East-West routes of Semarang city were generally higher than those on South-North routes.

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Mangrove Canopy Density Analysis using Sentinel-2A Imagery Satellite Data

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Abstract

Teluk Jor has alluvium surface sediment that came from volcanic materials. Sea wave that relatively calm and the closed beach shape support the existence of mangrove forest at Teluk Jor. Sentinel-2A imagery has a good spatial and spectral resolution for mangrove density study. The regression between samples and the Normalized Difference Vegetation Index (NDVI) values of Sentinel-2A used to analyze the mangrove canopy density. Mangrove canopy density was identified using field survey with transect method. The regression analysis shows field data and NDVI value has correlation R=0.7739 and coefficient determination R2=0.5989. The result of the analysis shows the area of low density 397,900 m2, moderate density 336,200 m2, the high density has 110,300 m2 and very high density has 500 m2. This research also found that mangrove genuses at Teluk Jor consist of Rhizopora, Ceriops, Aegiceras and Sonneratia..

Keywords: Mangrove; canopy density; remote sensing; Sentinel-2A

1. Introduction

The balance of coastal ecosystems influenced by the organisms that grow and develop around the coast such as mangrove, estuary, meadow/seagrass, coral reefs, small islands, and the deep sea. The length of Indonesia's shoreline with its physical condition can support mangroves to grow, thus Indonesia has 3.5 million ha of mangrove area [6], had been the largest in the world (18-23 %), after Brazil (1.3 million ha), Nigeria (1.1 million ha), and Australia (0.97 million ha [6].

Mangrove is a coastal vegetation that grows in tidal areas with the muddy shore. The mangrove forest is one of the tropical and subtropical forests that grow along the coast or a river that is affected by the tide. The mangrove forest can provide considerable benefits for the balance of nature, especially the coastal areas and coastal communities. Mangrove forest is a transition ecosystem between land and sea with the complex interactions between the physical and biological properties. Mangroves are found along the coastal area and can grow in the tidal area according to their tolerance to salinities, flooded area, substrates, and coastal morphology [3].

Mangrove forest has some advantages and functions for human life. Mangrove could be used for fuel, building materials, fisheries, textiles, agricultures, papers, home equipment, foods and beverages [6]. Mangrove has an important role in the coastal protection of currents, winds, and storms. For fishery, mangrove keeps the life cycle of fishes, shrimps, and mollusks, keeps the fertility of coastal area and also become organic matter supplier [6].

Forest canopy density is the most useful considered parameter for implementation in planning and environmental rehabilitation [1]. One of the methods to measure canopy density is from canopy cover. Canopy cover is the ground area that covered by the vertical projection of vegetation canopy or tree crown. [4]. Measuring canopy cover uses remote sensing data nowadays became more often because the remote sensing data has the ability to observe the earth surface.

Remote sensing is the science and art of obtaining information about the object, area, or phenomenon by analyzing data obtained using instruments without direct contact [7]. Sentinel-2A imagery has a high spatial resolution and can be downloaded for free. Sentinel-2A is a program of the Global Monitoring and Environmental Security (GMES) and

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the initiation of the European Commission (EC) and European Space Agency (ESA). This satellite was launched in June 2016. Studies that use Sentinel-2A imagery is still very rare, especially for mangrove forests study. Sentinel-2A imagery has a great potential in mangrove research because it has a high spatial resolution about 10 meters for visible and near-infrared bands.

Teluk Jor (located in Lombok Timur Regency) has a physical condition that allows mangroves to grow. Teluk Jor has alluvium surface sediment that came from volcanic materials. Sea wave that relatively calm and the closed beach shape support the existence of mangrove forest. Vegetation structure is related to ecological conditions, thus it is important to know the environment conditions. This study is to find out the application of Sentinel-2A in the study of mangrove canopy density at Teluk Jor.

2. Methods

2.1. Data used and pre-processing

Mangrove canopy density analysis was carried out with remote sensing data and field survey. Sentinel-2A was launched in June 23rd, 2015 and was prepared for providing earth observation for the environment, agriculture and security monitoring. Sentinel-2A satellite data that recorded on January 16th 2016 was used in this study, has various spatial and spectral resolution with 13 bands consists of 4 bands with 10 meters spatial resolution, 6 bands with 20 meters and 3 bands with 60 meters. This research uses visible and near-infrared data (band 2, 3, 4 and 8) for data modeling.

Sentinel-2A data preprocess with radiometric, atmospheric correction and finished with image transformation before can be applied for canopy density modeling. Radiometric correction retrieved by calibrating Digital Number (DN) divided by default quantification value that provided in the metadata. Atmospheric correction uses Dark of Pixel (DOP) method to decrease the atmospheric effect on reflectance value. Image transformation method has done with Normalized Difference Vegetation Index (NDVI) to shows the information about vegetation density

2.2. Field survey method

Measurement of mangrove canopy density use two methods are hemispherical and subjective density method. Hemispherical photography method that usually used for canopy identification with upward photo taking or downward using the wide-angle camera [5]. Hemispherical photography method has more advantages compared to other indirect methods, such as faster measurement, cheaper and permanent result. This method gives information about gap fraction distribution that can be used for forest canopy properties, for examples leaf area index, leaf angle distribution, and canopy openness [2]. Subjective density method is used for sample comparison. This method considering field canopy density and measure it based on density card. The sample data are obtained transect method. The transect was directed from the land to the sea.

Technically, canopy cover data obtained by taking photo upward with constant height, 1 meter in every sample location. Photo was taken 5 times; 1 photo at the center of plot and others on the surrounding. According to Sentinel's pixel size (10 m) was build sample area 15 x 15 m to anticipate the effects of surrounding object and geometric error. Can Eye software is used to obtain canopy cover values. The process is usually used hemisphere camera, but in this study, we use the pocket camera.

We also analyze the horizontal structure of mangrove by observing dominant and non-dominant mangrove genus in every sample location. The leaf, flower, stream and root of mangroves tree that found in sample location are identified and matched with mangrove genus characteristic table.

2.3. Mangrove canopy density mapping

Mangrove canopy density mapping uses two parameters, NDVI values of Sentinel-2A and field survey data of mangrove canopy cover. The NDVI image spectral transformation method gives an optimal result for identifying the variation of vegetation in relation to density (Bhandari, Kumar and Singh, 2012). Linear regression analysis is used for modeling mangrove forest canopy density at Teluk Jor. The independent variable is field data, and the dependent variable is NDVI values. Linear regression analysis gives the equation formula to extrapolating the canopy cover values in the defined area. The strong correlation between NDVI and field survey data indicates the model was good enough for estimating the mangrove canopy density in Teluk Jor. The correlation value explains the relationship, the direction of the relationship, and what passes for regression analysis. Whether or not the model depends on the coefficient of determination results of regression analysis.

3. Results

3.1. NDVI result

The canopy density model is made based on equation regression between field data and NDVI value. The result of Sentinel-2A image processing indicates that NDVI values can differentiate the existence of water, soil, and vegetation in the study area. Figure 2 shows the appearance of water is represented by a low NDVI value (red color), soil represents in moderate NDVI values (yellow color), and vegetation has high NDVI value (green color). NDVI transformation has the ability to distinguish objects reliable in identifying canopy density, with the assumption the higher canopy density also has higher NDVI value.

3.2. Field survey

Field data collection using transect method produces three transects consist of 17 sample plots. Transect method is chosen because of it is difficult to go through dense and muddy mangrove forest. Density measurement collected from-14:00 until 17:00 because the tide is low during this period. Thus the measurement can be done up to the edge of the lowest tidal. Based on field survey, four mangrove genus found at Teluk Jor. They are *Rhizophora*, *Sonneratia*, *Ceriops* and *Aegiceras*. The most genus is *Sonneratia*, but the most common mangrove genus found in the near of sea is *Rhizophora*. *Ceriops* and *Aegiceras* found in the middle of mangrove forest, but they are not dominant genus at Teluk Jor.

Mangrove structure at Teluk Jor has an irregular pattern. Based on field survey, the structure of the mangrove genus has not a distinct arrangement. For example in sample area that dominated by *Sonneratia*, *Ceriops* genus also can be found growing between them. Density value measured using two methods: subjective methods and hemispherical photography method. Subjective method values show the density ranges from 10% to 80%. The hemispherical photography method is processed using Can-Eye software, produces canopy density ranges from 8.06% to 68.83%.

3.3. Regression analysis

Mangrove canopy density measurement using subjective and hemispherical photography is analyze with linear regression analysis to get the correlation between NDVI values and field data. The best correlation between two methods is used to modeling the mangrove canopy density at Teluk Jor. Based on regression analysis, the correlation between subjective density method values and NDVI values is very low (R=0.2762), and the determination coefficient (R^2) is 0.0763. This result shows that the subjective density is not good enough to be modeled with NDVI value. In another hand, hemispherical photography has a much better correlation with NDVI Value. The result show, canopy density measured with hemispherical photography method has correlation R=0.7739 and coefficient determination R2=0.5989. The good correlation between canopy density and NDVI value show the regression formula was good enough for modeling mangrove canopy density.

4. Mangrove canopy density analysis

Mangrove density value produced by the model has a minimum value -130 633 % and a maximum value of 81 204 %. The result of the density map can be seen in Figure 5. The map shows the percent of the density of the resulting model of the regression formula. Negative density value on the map objects classed as non-vegetation while a positive density value classed as mangrove vegetation. The density is then classified into 4 classes to simplify the analysis. The result of mangrove vegetation with low density has an area of 397 900 m2, medium density has of 336 200 m2, the high density has 110 300 m2, and very high density has 500 m2. Qualitatively, it appears that there are much high-density mangroves near waters/sea, although there is also few thin low-density mangrove between the high density of mangroves and sea. There are many mangrove medium densities in the middle of the forest. Low-density mangrove widely available in the edge of medium density mangrove and has the highest number of extents compare to the other classes. Very high densities mangrove is only found at some point in between high mangrove density and has the smallest area of only 500 m2.

5. Conclusion

Remote Sensing data gave a lot of solution to model the environmental condition. Mangrove has a crucial part of environment but has fragile characteristic. Remote sensing has an ability to observe the earth condition, including mangrove forest. This paper show that Sentinel-2 satellite data have the ability to modeling the mangrove canopy density. The regression analysis between field canopy cover data using hemispherical photography method has good correlation with NDVI value that computed from Sentinel-2 data. The regression analysis shows field data and NDVI value has correlation R=0.7739 and coefficient determination R2=0.5989. The mangrove canopy density model shows that mangrove forest at Teluk Jor has varied canopy density. The density exists from 0% to 81.204%. The largest density class area was low canopy density mangrove, covering 397 900 m2 of the mangrove forest while the smallest was high-density mangrove class with only 500 m2. The moderate canopy density was covering 336 200 m2 and the high density covering 110 300 m2.

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Sustainable Nation

The Integration level of Public Transportation in Makassar City

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Abstract

Transportation development in metropolitan cities nowadays have switched to press the usage of private transportation and to improve public transportation through intermodal system and multimode transportation system. That means that several modes can be combined well, efficient and affective so that people can quickly move from one mode to another mode with cheap price and feel comfort. Network integration facilities and transportation system now are not fully materialized, such as public transportation service between one mode to another mode that make people have to take trip by another mode that have not been served with continuous transportation. Displacement intra mode on the other hand can not be done easily and quickly. This case makes people prefer to choose private transportation than public transportation. This purpose of this study is to know the integration mode level on public transportation. The Analysis used in this research are integration mode analysis by assessing each variable The next analysis is severity index to public transportation performance. The results of this research shows that the integration mode level consist of 2 criteria with very low value, 4 criteria with low and medium value, 2 criteria in high value, also 1 criteria in very high criteria.

Keyword: Integration; Public Transport

1. Introduction

The problems that were encountered in major cities, including Makassar city is the issue of transportation. In general, problems arise when society is prefer to choose a private vehicle as their daily vehicle. The problem is increasing, while the growth of private vehicles is not balanced with increasing length of the road. Policy makers, began to switch to suppress the use of private vehicles and improving public transport facilities and infrastructure. Way through the intermodal transport system and integrated public transport system (multimodal). That is, the various modes can were combined properly, efficiently and effectively so that people can move from one type of transportation to another carrier with a quick, cheap and convenient.

The integration between infrastructure networks and transport services is not fully realized, among others, can be seen from the public transport service between modes, one with the other modes, which causes people have to travel by other modes and can not be served by transit. In addition, the displacement intramoda can not be done easily and quickly. Likewise, the integration of network infrastructure, such as terminals, ports, airports and setting a schedule that has not been satisfactory.

The integration of transport modes can be viewed from two aspects, namely the integration of physical and non-physical alignment. Physical integration is form of the integration of facilities and infrastructure, while the non-physical integration is form of the integration time, information systems, services, and ticketing. (Agus Mulyono T. 2012), while for modal choice, in general is influenced by the characteristics of the use of modes / characteristics of the transport system. That characteristics can be quantified such as the time, cost, availability of space and parking (Tamin, OZ. 2000). Several issues regarding the use of public transport as well as the integration of the network are:

1. Community of Makassar preferred modes of public transport instead of private vehicles in- movement (RTRW Kota Makassar 2005-2025)
2. The passengers number of commercial vehicles that are not proportional to the number and type of public transport available in the city of Makassar

2. Methods

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This research uses descriptive analysis method using several analytical tools. The level of integration is obtained by using the canvas appraisal as the overall conclusions. The assessment criteria used is to use the physical integration of variables such as facilities and infrastructure, and variabel of the non-physical integration is travel time. Another analysis used is the Severity Index analysis to determine the most influential factor based on the service level. The analysis used to determine the level of integration among others are the main mode of analysis and feeder mode, the performance analysis of public transport (headway and loadfactor), connectivity index, the scale of stops and terminal services, travel time index, and severity index.

In this study, assuming the available time is as much as 24 hours in 30 days. Time remains for study is 6 hours per day, and the assumptions used for the sampling time (interview with a passenger) is 4 hours a day. From these assumptions result, the obtained results of calculation of population as follows:

$$n = \frac{720 - 180}{4}$$

$$n = \frac{540}{4}$$

n = 135 person

Furthermore, the number of 135 passengers proportioned based on the number of city transport modes consisting of 15 designated route as well as the first BRT corridor / Busway which is currently in operation.

3. Results

The length length of roads in the Makassar in 2009 along 1593.46 kilometers; Compared to 2008, road length has not changed. In 2009, the roads that have good conditions increased 32.82% compared to 2008. The roads that badly damaged has down 45.74% from 2008. Public transport in Makassar include city transportation (usually called *pete-pete*), Bus Rapid transit (BRT) called Trans Mamminasata, taxibike, trishaw, motorcycles and motorcab. City Transport contained in Makassar consists of 15 stretch in the city and the outskirts stretch. As for the Bus Rapid Transit (BRT) Transmamminasata the buses that serve the metropolitan area Mamminasata. Mamminasata an abbreviation of Makassar, Maros, Sungguminasa, and Takalar. Maros, Sungguminasa, and Takalar a district that is located around Metropolitan area of Makassar.

In the planning, this BRT corridor will have 11 buses with a capacity of 33 persons. BRT uses track mix, which is mixed with other vehicles, but for setting up and down passengers were required off at the stop that has been provided. For existing conditions, BRT Transmamminasata which has been operating as many as 1 corridor, namely corridor II (GTC Mall - Mall Panakkukang) 11 units bus.

Makassar City has two terminals, namely the Daya Terminal located in northern part of the city, and Mallengkeri Terminal in the south. Another terminal is located in the Makassar Mall, but the terminal is just a ride down a regular passenger, and not have buildings. Daya Terminal is a terminal with type A, and Mallengkeri Terminal is type B. Daya Terminal 3 is traversed by publik transportation route (route D G, W), while for Terminal Mallengkeri traversed by four designated route (route B, B1, F, and F1). Also, there are 27 stops, spread over 11 streets.

Based on a primary survey that moda contained in Makassar, consists of a Bus Rapid Transit (BRT), city transport, tricycles and motor tricycles, motorcycles, and pedestrian paths. All these modes will be classified according to the type of use, route determination, the determination of the schedule, tariff determination, the operation area, the density of the service area, service configuration, the right of priority roads, and travel route.

Based on analysis, it can be concluded that the modes become the main mode of transport is BRT and the city transport, while the rest tricycles / motor tricycles, motorcycles, as well as pedestrian / sidewalk a feeder mode.

On Table 1, it is known that 12.59% of people using the 3 modes in one trip, such as public transportation, walking, and pedicabs. Meanwhile, the rest using two modes of public transportation or a mix between BRT and walking, rickshaw, taxis, and private vehicles. People who use public transportation with two different routes are as many as 20 passengers. Based on the concept, the more selection modes and more modes are used, then the condition is already integrated. The average usage mode is as much as 2.38 with the use of at least one mode and a maximum of 4 modes.

Table 1. Main and Feeder Mode in Makassar

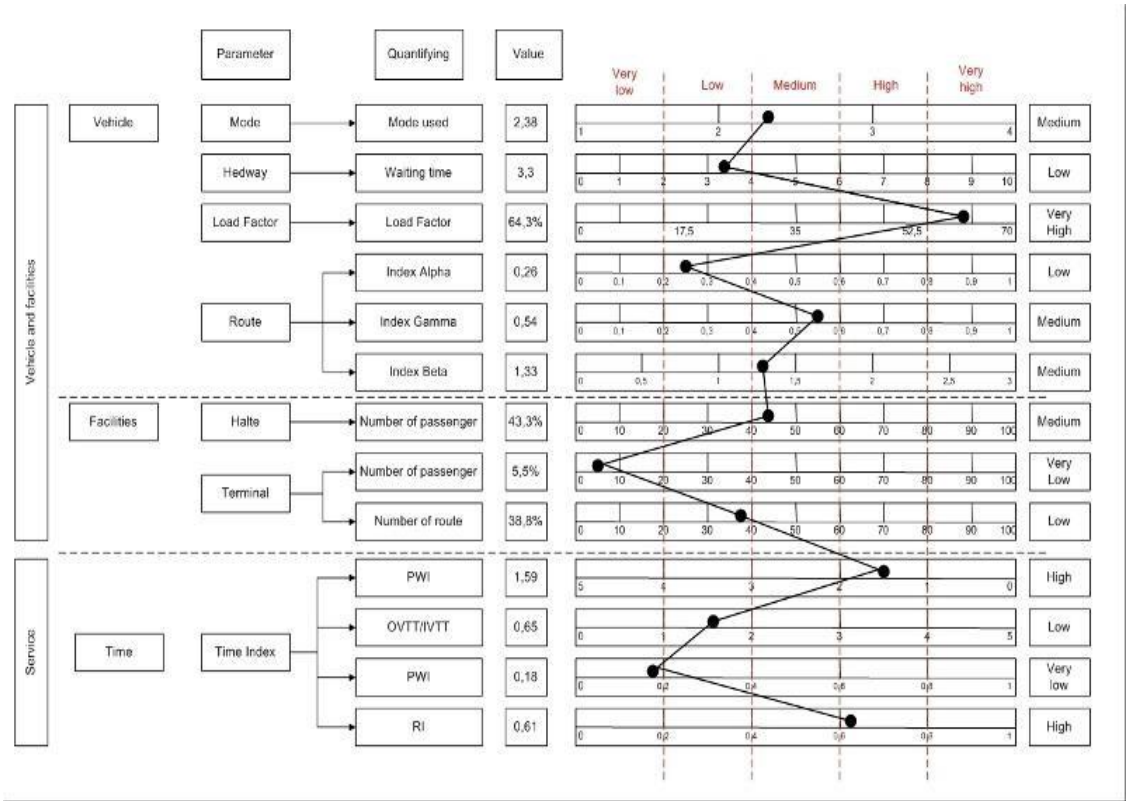
Feeder	Main	
	City Transport	BRT
Walk/Pedestrian	88	0
Pedicab	18	0
Motorcycle Taxi	7	0
Private Vehicle	4	0
Walk/Pedestrian and Pedicab	17	1
Total	134	1

Connectivity value or public transportation route network complexity and BRT in Makassar was 1.36 for the beta value, gamaa value of 0.46, and an alpha value of 0.18 with an average value of the index is 0.67. The bigger index value, the network will get better service.

Table 2. Road Connectivity Index in Makassar

Kecamatan	Node	Internode	Beta	Gamma	Alpha
Biringkanaya	11	12	1,09	0,44	0,12
Bontoala	21	36	1,71	0,63	0,43
Makassar	10	19	1,90	0,79	0,67
Mamajang	9	13	1,44	0,62	0,38
Manggala	13	16	1,23	0,48	0,19
Mariso	7	7	1,00	0,47	0,11
Panakkukang	23	30	1,30	0,48	0,20
Rappocini	13	19	1,46	0,58	0,33
Tallo	16	22	1,38	0,52	0,26
Tamalannrea	11	12	1,09	0,44	0,12
Tamalate	16	20	1,25	0,48	0,19
ujung					
pandang	25	30	1,20	0,43	0,13
ujung tanah	4	4	1,00	0,67	0,33
Wajo	25	37	1,48	0,54	0,29
Total	204	277	1,36	0,46	0,18

The integration level of land transport modes Makassar City based on 13 evaluation criteria (Figure 1), there are two categories that have a very low value, ie the number of passengers up and down the terminal and passenger waiting time index (PWI). In addition ,, there are four criteria that are at a low value, ie the number of modes, the index alpha route, the number of the route which passes through the terminal, and the ratio of OVTT / IVTT. For that is in the medium category, there are also four criteria, namely the number of modes used, the index alpha, gamma index, and the number of passengers up and down at the stop. As for the rest, two criteria are at high criteria, namely the ratio of travel time and Running Index and criteria on the value is as high as the number of passengers.



4. Conclusion

The level of integration of transport modes in Makassar City based on 13 criteria for assessment, there are two categories that have a very low value, ie the number of passengers up and down the terminal and passenger waiting time index (PWI). Beside that, there are four criteria that are at a low value, ie the number of modes, the index alpha route, the number of the route which passes through the terminal, and the ratio of OVTT / IVTT. The criteria in the medium category, there are also four criteria, namely the number of modes used, the index alpha, gamma index, and the number of passengers up and down at the stop. As for the rest, the two criteria are at high criteria Ratios Time Travel (RWP), and Running Index (RI) and 1 criteria with a very high value on the criterion of the number of passengers. Increase integration of land transport modes can be done by improving variables that have a low cohesion values, as well as having a great influence based on public perception

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The Modal Transfer Analysis by Adding Transport Costs Case Study: The Use of Bus and Private Vehicle Student Institute of Technology Sumatera

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Abstract

Transportation becomes a necessity for human life, for transport to facilitate mobility access to a person in everyday activities. In accordance with the number of goals target 11 in the Sustainable Cities and Communities that are discussed in the general assembly of the United Nations (UN) on 25 September
2015 authorizing Interest Sustainable Development (SDGs) 2030, providing access to safe, affordable, accessible and transportation systems sustainable for all, improve road safety, particular by expanding public transport, with particular attention to the needs of their review in vulnerable situations, women, children, the disabled and the elderly.
Since 2015 the Institute of Technology of Sumatra students receive as much as approximately 400 students later in 2016 Sumatra Institute of Technology students received a total of about 1200 students. This is a new issue which increased the number of students who use private vehicles, with limited parking space on campus Itera lead to less availability of parking spaces on campus Itera. Until August 2016 regarding the regulation of smokeless was made by the rector, with the aim to make a transfer mode of transportation to the entire academic community Itera. With the implementation of the policy of smokeless implemented within one week. However the policy is not entirely well received by the entire academic community Itera, supported by the lack of public transport leading Itera. Bus Trans Lampung be the only public transportation that operate to Itera to stretch Unila-Itera. In this study, researchers conducted a survey when the vehicle parking fee is charged at the campus of Itera, the extent to which the student's ability to pay for services it receives to switch modes from using private vehicles will be using public transportation.
This study was conducted to see the transfer of capital from the entire academic community Itera, from private cars to public transport such as buses, with the addition of transportation cost s in the form of parking rates. Itera to analyze student data, researchers used a descriptive statistical analysis methods. Through methods relating to the collection and presentation of a variety of data so that it can provide useful information called Descriptive Statistics. In this study the determination of the number of samples is 100 people with a 90% confidence level using Taro Yamane formula (Cluster Random Sampling) where:

$$n = \frac{N}{Nd^2 + 1} \qquad (1)$$

Keywords: Sustainable transport; Displacement modes; Private vehicle; Bus; Parking fee

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Mode selection model aims to determine the proportion of people who will use each mode. This process is done with the intention to calibrate models of modal choice between the base year to determine independent variables (attributes) that affect the modal choice. Factors that may affect the selection of these modes can be grouped into four (Ben-Akiva and Lerman, 1985), namely: (1) Characteristics of road users; (2) Characteristics of the movement; (3) Characteristics of transportation facilities; and (4) Feature town or zone. Model forms modal choice in European countries is dominated by a model of the distribution of the movement, so that the modal choice models should be used after dispersion modeling stage movement. In this study, there are two types of modes of transportation are: buses and private transport, the analysis in this study using a modal choice model of cost. Costs in modeling modal choice, it is important to distinguish between the estimated cost and the actual cost. Cost estimates are the costs that feel pressure by road users and basic decision-making, while the actual cost is the actual cost incurred after the electoral process modes do.

In this study, researchers conducted a survey directly to all students of the Institute of Technology of Sumatra on the analysis of the modal transfer policy smokeless day on campus Itera, in order to obtain a sample of 100 students with a variety of diverse opinions on the policy smokeless day. In order to keep transportation costs for the students in a day, the data necessary expenses or income students Itera. Researchers obtain data that as many as 24.80% of the students have the Rp. 15.000, - per day, and while the cost incurred by the person for transport costs in the everyday is 30% of the revenue or expenditure of a person in a day. If the student spending a day fifteen thousand rupiah, the transport costs incurred in a day is Rp 4.500, -.

Table 1. Comparison of The Percentage of The Number of Private Vehicles and A Bus Ride Will Take Effect When The Parking Rates.

Parking Fee	The Number of Users of Private Vehicles	The Number of Bus Users
Rp 1.000,-	88%	12%
Rp 2.000,-	78%	22%
Rp 3.000,-	59%	41%
Rp 4.000,-	46%	54%
Rp 5.000,-	44%	56%

(Source: Survey researchers, processed)

The above table shows that at the time of parking charges applied to Rp 1,000, - the percentage of students who ride personal vehicles 88% and the number of students who ride buses 12% of the total student Itera. In the parking fee is applied Rp 2.000, - the percentage of students who ride personal vehicles 78% and the number of students who ride buses to 22% of the total student Itera. Then at the parking fees applied Rp 3.000, - the percentage of students who ride personal vehicles to 59% and the number of students who ride buses 41%. Furthermore, when the parking fee is applied Rp 4.000, - the percentage of students who ride personal vehicles to 46% and the number of students who ride buses 54%. Then when the parking fee was raised to Rp 5,000, - the percentage of students who ride personal vehicles dropped to 44% and the number of students who use the bus transport 56% of the total student Itera.

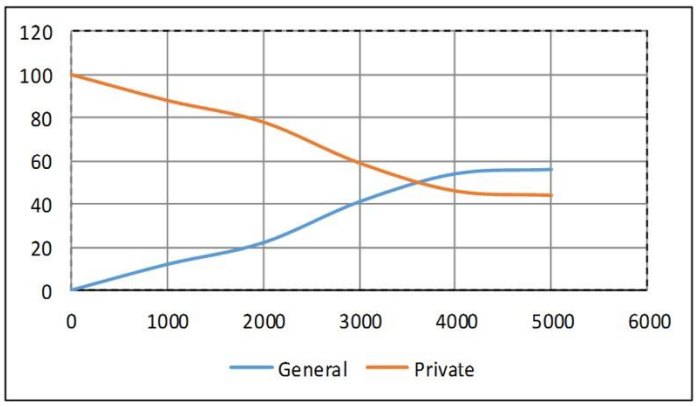

Figure 1. Graph private vehicle transfer to the bus (source: Survey researchers, processed)

The graph above that at the time of parking fees applied will make the student make the shift mode of transportation to the bus, due to the ATP and WTP owned by Itera student than he paid parking is more expensive than paying the cost of bus transportation. So if the parking fee to be increased, it will cause all students Itera use bus transportation. It

showed that when the parking fee increase occurred in transportation modal transfer from private cars to bus transportation. So at certain parking charges can hit up all the students Itera use bus transportation.

From interviews with the Trans Lampung income earned by Trans Lampung property of Lampung Province which operate on routes ITERA-UNILA calculated based on the average income of the seven Trans Lampung which operates on this route is the lowest incomes per day Rp 16.000, - and the largest revenue per day Rp 250,000, - with a 1-trip transportation costs for students / student is Rp 2.000, -. As for public transport costs 1 trip Rp 4.000, -.

Table 2. Revenue Lampung Trans Bus Route ITERA - UNILA

Day	Income (Rupiah)
Monday	± 50.000,-
Tuesday	± 200.000,-
Wednesday	± 30.000,-
Thursday	± 30.000,-
Friday	± 30.000,-
Saturday	± 30.000,- ± 100.000,-
Sunday	± 30.000,- ± 100.000,-

Source: Results of interviews, 1 November 2016

From the above table illustrates the low income obtained by the Trans Lampung every day. The low revenue showed no effective and efficient operation on the route. Though bus takes money to do maintenance, employee salaries, and so forth. However, from the interviews of the Trans Lampung no bus maintenance costs to date for free bus maintenance costs. After that, the bus departure schedule no one has made irregular bus arrivals. However, the earliest departure time 05:30 pm and the afternoon return schedule at 17.30 pm. With a capacity buses that can accommodate 30 people seated passengers and 40 standing passengers, so the total capacity of the bus is 70 people. With the capacity and the service bus every day can travel ITERA ITERA-UNILA-3- 4 times.

The survey also directly taken based on student opinion against the policy of the day without a smoke, that is not the entire academic community Itera agree with this policy. That as many as 69% of students do not agree with the policy Itera days without smoke even though there are 31% of students who agree with the policy of the day without a smoke. It states that the policy of the smokeless is a program that seems inappropriate to make a transfer mode of the entire academic community of the Institute of Technology Sumatra.

Table 3**.** Percentage of Itera student opinion against the smokeless policy based on the most frequent.

Student opinion	Stake	Percentage
Maintain the environment by reducing air pollution		21%
Assessing the "Day without smoke" is "moving day parking"		11%
Lack of service providers		9%
The bus route does not pass through a student residence		16%
Bus schedule uncertain		15%
All others		28%

Source: Data and Analysis

On the results of this research into the creation of sustainable transport development researchers obtained data is that some students' opinions on policy smokeless in Itera that affect the level of their desire to switch modes from using private vehicles will use the bus. Because there is a sample of 15% of the students who did not agree with the holding without the smoke because they find departure and arrival Bus Trans-Itera Unila Lampung route is uncertain, and causes some students dating late to go to college at that hour. There are also examples of 16% of students who do not agree with this policy of smokeless found Lampung Unila Bus Trans-Itera not through their residence, and this resulted in them must arrange a time to go to college even earlier. Last opinion was expressed by the students to be able to switch modes is the need to improve the quality of service modes of transport through Bus Trans Lampung with the percentage as much as 9%.

Trans Lampung Bus is the only bus that has the purpose to the University of Lampung without transit transport to another. The bus route Trans-Itera Lampung Unila Ryacudu through the canal road, turn left onto the street Hi Prince

Suhaimi, continue past the primary collector road Mayjend Riyakudu, and turn right into Jalan Soekarno-Hatta primary artery to a stop in front of the campus of the University of Lampung. Airport Bus Trans Lampung is this that can not be coverage area thoroughly for the entire academic community residence Itera, this raises new problems that result are often late arriving students into campus. It can be concluded to make the mode shift transport from using private vehicles using the bus can occur if Trans Lampung fix the three systems, including: (1) the scheduled departure and arrival of buses, (2) providers of healthcare facilities and support, and (3) the addition of bus route Trans Lampung. Three systems are related to each other, and the system also greatly affect the level of people's willingness to use the convenient bus transportation. Extra parking fee is quite high transport costs exceed the capacity of the publication, which is Rp 4.500, -. So if the parking fee to be paid beyond that will make the entire academic community Itera transfer to bus transportation Trans Lampung with support by the supporting facilities. Furthermore Trans Lampung also must perform enhancer bus lines to meet demand. Additional bus service can be done is a bus passing through Jl. Canal Ryacudu then to Jl. Hi Pangeransuhaimi passing through Jl. Raya subsequent flow through Jl. Dibalau queen and last through primary arterial highway middle Sumatra Jl. Soekarno-Hatta to a stop in front of the campus of the University of Lampung. On the route was made to the coverage area around the road there are many markets and traditional housing.

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Potential to Increase Active Commuting Level in University Area (Case Study: Universitas Gadjah Mada)

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Abstract

In order to alleviate the negative impacts of motorized vehicle use as well as create sustainable environment within campus area, it is pivotal to encourage mode shifting among university students. Active transport modes such as walking, cycling, and using public transport can be considered as alternative modes. This paper tried to identify the potential for increasing active commuting in UGM by understanding student's travel behavior. ANOVA test was employed to identify the perceptions between students across residential zones toward motivators and barriers to actively commute. The findings were used to propose strategies for increasing active commuting level in UGM, which are: reducing barriers to actively commute, improving public transport services, improving walking and cycling facilities, and introducing programs to discourage motorized vehicle use.

Keywords: active commuting; active transports

1. Introduction

Nowadays, universities all over the world has been increasing their attention on encouraging the usage of environmental friendly transport modes as strategy for implementing sustainable transportation in university environment [1,2]. This idea is emerged since university area has attracted trip with a regional scale. Therefore, transportation problem in university will significantly contribute to a problem in the bigger setting. Implementing sustainable transportation policy for university area will not only create a more livable university area but also contribute to the overall sustainability of the city [3].

One of the oldest university in Indonesia, Universitas Gadjah Mada (UGM), has high number of students which increase over time. The increasing number of students enrollment are associated with high number of motorized vehicles in campus area as students tend to choose motorized vehicles for their mobility.

University students are a group that tends to use various types of travel mode, including large proportion of active transport used. Active transports can be alternative way for bringing sustainable context in the university. Walking, cycling, and using public transport are considered as active forms of transport since these type of modes involve physical activity [2]. Moreover, according to Gatersleben and Appleton [4], student population were the easier group to target for active commuting since they mostly could not afford their own vehicles and do not like to rely on infrequent bus services. Thus, active modes can provide an excellent form of flexible transport for them.

University students come from various regions, thus forced them to live in temporary residence. In choosing this residences, distance to the campus becomes student's main consideration [5]. Therefore, majority of students who comes from other region will live in campus surrounding. Relatively close to campus however does not make high used of non-motorized vehicle. There are also plenty of trips which made by students causing high traffic in UGM area. Student mobility following with their complex travel behavior, indeed become one of contributor for the traffic in the area.

This paper tried to identify the potential for increasing active commuting in UGM by understanding student's travel behavior. Student's travel behavior is identified through their travel characteristics as well as their perception towards the barriers and motivators to actively commute. Finally, the findings will be used to propose several suitable strategies for increasing the levels of active commuting among students in UGM.

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2. Methods

Data was collected by randomly disseminating questionnaires to active students in UGM through social media, personal messages, and electronic mail. The questionnaire consisted of two sections. In the first section, questions related with socio-demographic information were asked. These included age, gender, year of admission, residential distance, motorized vehicle and bike ownership, access availability to public transport and motorized vehicle, number of trips in normal day, frequency of university trips during a week, and mode choice. Then, in the further section, respondents were asked to measure several motivator and barrier items for revealing the importance level of those items in encouraging and/or impeding them to use active transport modes in their trips to university.

The motivator and barrier items were rated by using a Likert scale of 1-5; 1 being 'not at all important' or 'not at all likely' and 5 'very important' or 'very likely'. In order to understand the possible active transport mode based on students' residential distance, the region was divided into three zones (Zone 1: < 1 km from UGM, Zone 2: 1-5 km from UGM, and Zone 3: >5 km from UGM).

As the purpose of this paper is to identify the potential for increasing active commuting level based on students current travel behavior, data interpretation become important where some trends and facts will be revealed which may useful for further analysis. To begin the data analysis process, descriptive statistics were calculated to summarize and describe the data obtained. The analysis was executed by using one-way ANOVA test which can be used to identify the different perceptions of motivators and barriers toward active commuting behavior among students. This finding will be used to propose strategies for increasing active commuting level in UGM.

3. Results

3.1. Travel Characteristics

Most of students reported motorcycle (73%) as their mode choice for university travel. While car only accounted for about 7% of students' travel mode. Accordingly, there were 80% of the students using motorized vehicles for the university trips. In contrast, there were only few students who reported active transport as travel modes. Walking, cycling, and public transport were reported to be used by 12%, 7%, and 1% of the students respectively.

Regarding their residential location, result showed that walking and cycling were quite high for those living in Zone 1 and Zone 2, most likely because this zone is feasible to be reached by this type of travel modes. Meanwhile, it is no doubt that in Zone 3, only less than 1% of students using public transport and bicycle, and none of them walking to campus. In addition, public transport use was generally not popular among students within all zones. It is only reported less than 2% of students in all zones.

Table 1. Main mode of transport among students based on residential distance zone (%)

Mode choice	Distance		
	Zone 1 (<1 km) n = 137	Zone 2 (1-5 km) n = 213	Zone 3 (>5 km) n = 120
Car	3.6	7.0	12.5
Motorcycle	55.5	77	85.8
PT	1.5	1.4	0.8
Bicycle	8.8	8.9	0.8
Walking	30.7	5.6	0

3.2. Motivators and Barriers for Active Commuting

In order to elaborate students' perceptions towards active commuting behavior according to their travel distance to the university, the motivator and barrier items were analyzed with the residential distance zone categories. There were significant differences for several motivator items across three zones. Significant differences were occured in motorized free vehicle area ($F(2, 414) = 3.651$, $p < 0.05$); parking restrictions ($F(2, 414) = 3.483$, $p < 0.05$); and protected lanes from weather ($F(2, 414) = 3.665$, $p < 0.05$). Those within closer residential distance from the university rated these three items higher than those living far from university. This finding also reveals that students more motivated with pushed measures rather than pull measures.

For barrier items, there were also significant differences across three zones, including travel distance and travel time. Moreover, the biggest significant differences were also occured in these two items (travel distance ($F(4, 414) = 14.085$, $p < 0.001$); travel time ($F(4, 414) = 8.939$, $p < 0.001$)). Furthermore, barrier items associated with public transport services, the coverage area and frequent service, were also reported with high importance for impeding

students to actively commute with statistically significant differences between those in Zone 1 and 3. This reveals that students in Zone 1 and 2 have slight similarity in perceiving barriers for active commuting.

3.3. Strategy Implications

It is clear that a variety of different strategies are needed to be adopted in order to increase active commuting among students in UGM. Moreover, the proposed strategies have to be compiled based on which conditions might motivate or hinder students to perform active commuting behavior. Some strategies which will effectively increase the level of active commuting among students in UGM can be suggested as a result. The strategies that could be employed to increase the level of active commuting among students in UGM as well as some supporting evidences will be discussed in below.

a. Reducing barriers to actively commute

Results revealed that most of students are currently a non-active commuter. Generally, non-active commuters perceived more barriers than active commuters. Therefore, reducing barriers to actively commute is proposed as the first intervention in order to target these larger proportion of students regarding stages of change. Giving more attention to personal barriers can be more important than providing infrastructure. Some approaches reducing the perceived barriers to actively commute are needed.

b. Improving public transport services

According to its transportation master plan document, it is clear that UGM already realized that it is impossible to prohibit the used of car or motorcycle in the campus area without preparing other alternative modes including its facilities. It is also not feasible to enforce academic communities, especially those who live far from the university, for cycling or using public transport from their residential place since the current urban transportation policy can not guarantee cyclists' safety on the road and public transport services are not reliable in serving urban mobilities. Meanwhile, there are a sizeable proportion of students living in Zone 3 who only rely on public transport services.

Therefore, the idea for improving public transport services are needed to be adressed in order to attract more students of UGM to actively commute. Indeed, it is not things which can be done by the university. The regional government, as the public transport authority, are needed to be involved for implementing this strategies. Therefore, it is important to underline that the development of campus transportation can not stand independently since it is always affected by the urban transport policies.

c. Improving walking and cycling facilities

The results in this study demonstrate that active commuters are found to be more attracted by the motivator for active commuting rather than non-active commuters since they are already performing active commuting behavior. These student groups live in both Zone 1 and 2. Therefore, it is suggested for UGM to consider improving walking and cycling facilities in campus area as well as collaborate with regional authority for improving cycling facilities in Yogyakarta area.

d. Introducing programs to discourage motorized vehicle-use

Implementing strategies to create an active commuting behavior in campus area through reducing the convenience and cost-effectiveness of driving have been introduced in many universites [6]. It also suggested further to employ a comprehensive approach includes both "carrot and stick" strategies, in which encouraging people to consider issues other than travel time, such as the cost of commuting [2]. At the beginning, this schemes are suggested to be implemented by GMU through introducing car free day program and increasing motorized vehicle free area in the university. These two conditions were found to be considered by students as important motives to actively commute and they also feel to be more encouraged for using active modes if the university employed these interventions.

4. Conclusion

Findings revealed that majority of students are using motorized transport as their travel mode to the university (78%) while only the rest accounted for active transport modes. Regarding the perception towards motivators and barriers to actively commute, results indicated that there was statistically significant differences between students across residential zones in perceiving the importance of each items in motivating and hindering them to actively commute. The findings then be used to compose several strategies for increasing the level of active commuting among students in UGM which are: reducing the barriers to actively commute, improving public transport services, improving walking and cycling facilities, and introducing programs for discouraging motorized vehicle-use.

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Water Hyacinth Management Plan at Lake Toba Samosir Regency

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Abstract

Lake Toba is a national lakes priority that has been degradation because of human activities. Lake Toba must be managing to restore the ecosystem lake. The principal of Lake Toba ecosystem management refers to sustainable development system. Lake Toba has been assigned as a National Strategic Area by the President Rule Number 81/2014 about Spatial Planning Lake Toba Area. Lake Toba is one of tourism destination that will be selected as a Geopark in Indonesia so that Lake Toba has an important function to increasing the economic and people's prosperity. The environmental problem of Lake Toba enlargement is water pollution. The restoration of Lake Toba ecosystem has been initiated since 2004 with Lake Toba Ecosystem Management Plan (LTEMP) and then continued with Save Lake Toba Movement in 2014. The source of water pollution such as organic material can be increasing the growth of water hyacinth (*Eichhornia crassipes (Mart.) Solms*) and interfere the water quality. Utilization of Lake Toba such as floating cage aquaculture, domestic activities and agricultural cultivation impacts the water quality. This activities producing nutrient waste like phosphate and nitrate. This phosphate and nitrate causing an eutrophication that can inflict the growth of water hyacinth. Lake Toba currently covered by water hyacinth and almost found in all shore line. The ecosystem management plan which has been done did not answering the problem of Lake Toba especially water hyacinth problem. This research studies about water hyacinth management modeling by SWOT analysis. The modeling of water hyacinth in Lake Toba, Samosir Regency using an Integrated Control to managing the growth of water hyacinth. Water hyacinth Integrated Control using 3 methods such as physical removal, biological control and social program. An important thing that can be controlling the water hyacinth growth is setting up the regulation about limitation of floating net aquaculture according to President Rule Number 81/2014 and Save Lake Toba Movement Program.

Keywords: Integrated Control, Lake Toba, SWOT, Water Hyacinth

1. Introduction

The growth of economic development gives a negative impact to environment and damaging the natural resources. There is a difference between economic development and economic growth. Economic development marked by natural resources utilization. Sustainable development is an important concept, because it's repairing the development by using natural resource in efficient way [1]. Government has assigning 15 lakes priority that had been run into critical condition and become environmental crisis to be solved. Lake Toba is a national lakes priority that has been degradation because of human activities. The restoration of Lake Toba ecosystem has been initiated since 2004 with Lake Toba Ecosystem Management Plan (LTEMP) and then continued with Save Lake Toba Movement in 2014. Lake Toba has been assigned as a National Strategic Area by the President Rule Number 81/2014 about Spatial Planning Lake Toba Area. The activity at Lake Toba produces solid waste and liquid waste. Generally, the source of waste on water body is from settlement and tourism activities [2]. The water pollution likes organic material causing the growth of water hyacinth (Eichhornia crassipes (Mart.) Solms). Water hyacinth gives a negative impact for environment, social and economic if biomass water hyacinth get overflow [3]. Some threats because of water hyacinth are evapotranspiration, eutrophication and biodiversity damage [4]. There are three methods (Jones, 2001) to control the water hyacinth such as manual remove or using machine, herbicide and biological control [5]. The water of Lake Toba is now overgrown by water hyacinth and has been found in almost the entire coastline, so its presence causes pollution scenery (aesthetic pollution). Management of the ecosystem of Lake Toba that has been done is not yet answered the environmental problems. This paper studies about water hyacinth sustainable management.

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2. Methods

This research is a descriptive analysis. Based on data, this research using primary data that is obtained from in depth interview. The informant was chosen by Purposive Random Sampling. The informants are Samosir Government, Samosir's people and NGO. To know the model of water hyacinth management used SWOT (Strength, Weakness, Opportunity, and Threat) analysis.

3. Results

The growth of water hyacinth at Lake Toba, Samosir Regency from one sprout become 2 sprouts needs 8 days with biomass (H_{28}) 179.22 gram. The relative growth rate (RGR) of water hyacinth at Lake Toba is 4.21% at H_{28} [6]. Based on depth interview with the key informant, there is a removal method to control water hyacinth that was held by Government (Environmental, Research and Development Organization) and the people who live in Samosir utilizing the water hyacinth into handicraft like bag, hat and mat. The identification for internal factors (Strength and Weakness) and external factors (Opportunity and Threats) can see in Table 1. To get the value of Internal Strategic Factors Analysis Summary (IFAS) and External Strategic Factors Analysis Summary (EFAS) was using Pair Comparison Method.

Table 1 Identification of Internal and External Factors of Water Hyacinth Management at Samosir Regency

Identification of Internal and External Factors of Water Hyacinth Management	
Strengths (Internal Factors)	Weaknesses (Internal Factors)
1.The growth of water hyacinth in Lake Toba, Samosir regency tends slowly	1. Status of water quality of Lake Toba, Samosir regency in conditions Blackened Light;
2. The existence of policies issued by the Head of the Department of Education to all students in Samosir to use hyacinth bag	2. Technology to controlling the water hyacinth just using removal method;
3. There is 2 water hyacinth's boat and 10 freelance to removal water hyacinth from Lake Toba;	3. There is a limited budget to managing water hyacinth at Lake Toba;
4. There is 1 group water hyacinth's craftsmen obtain 10 member of that group;	4. Harvesting the hyacinth inappropriately (cut the roots);
5. There is water hyacinth removal program that was held once a month	5. High phosphate levels (exceeding quality standards) in the waters of Lake Toba will trigger the growth of water hyacinth faster;
Opportunities (External Factors)	Threats (External Factors)
1. Water hyacinth management is a one of Save Lake Toba Movement Program;	1. There is a perception from Samosir's people and other institute that the water hyacinth problem is a responsibility of Environmental, Research and Development Organization;
2. There is a President Role Number 81/2014 about Spatial Planning Lake Toba Area to support the water hyacinth management;	2. The weather condition (east wind) causing the water hyacinth move from other regency to Samosir regency;
3. There is President Role Number 49/2016 about Tourism Area Management of Lake Toba Authority.	3. There is less consideration from Central Government and Province Government.

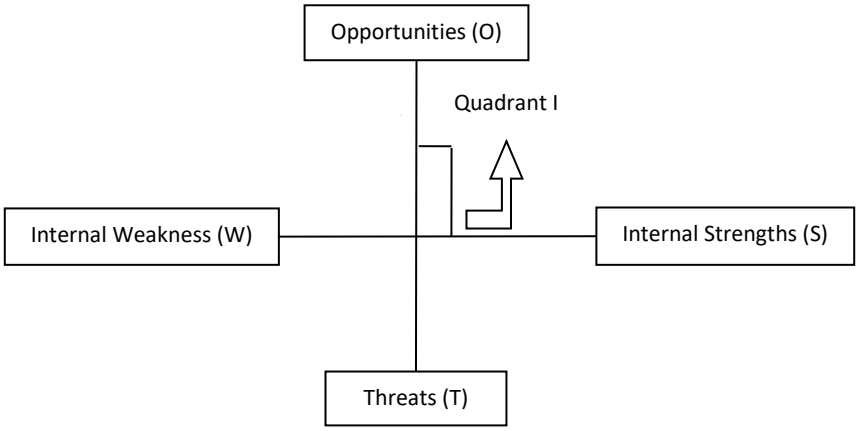

Fig. 1 Matrix of Internal and External Strategic

To determine the score for each factor used Paired Comparison Method. The calculation of IFAS and EFAS was in first quadrant (0.54, 1.38), the meaning of this value is show the coordinate (x,y) so that the strategy to management the water hyacinth using SO Strategy see Figure 1.

The strategic to controlling the water hyacinth at Lake Toba, Samosir Regency are:

1. Makes the Save Lake Toba Movement Program as reference to managing the water hyacinth;
2. The growth of water hyacinth was managing by sustainability of handicraft and compose;
3. Controlling an authorize of floating net aqua culture ;
4. Set up the water hyacinth zone;
5. Improving the technology of water hyacinth management;
6. Making the countermeasures of agriculture waste and controlling the pesticide.

The models approach of water hyacinth management at Lake Toba, Samosir Regency using 3 methods (Integrated Control) such as physical removal, biological control and social program. Water hyacinth must be managing wisely because this plant can be advantaging and harming for our life. It is undeniable that the water hyacinth also has benefits for a biotic as filtration to absorb the pollutants (like heavy metals) so that the water hyacinth should not be washed-out on lake but can be controlled its growth by building zoning hyacinth in the catchment area of Lake Toba and harvesting water hyacinth regularly. The model of water hyacinth management can see Figure 2.

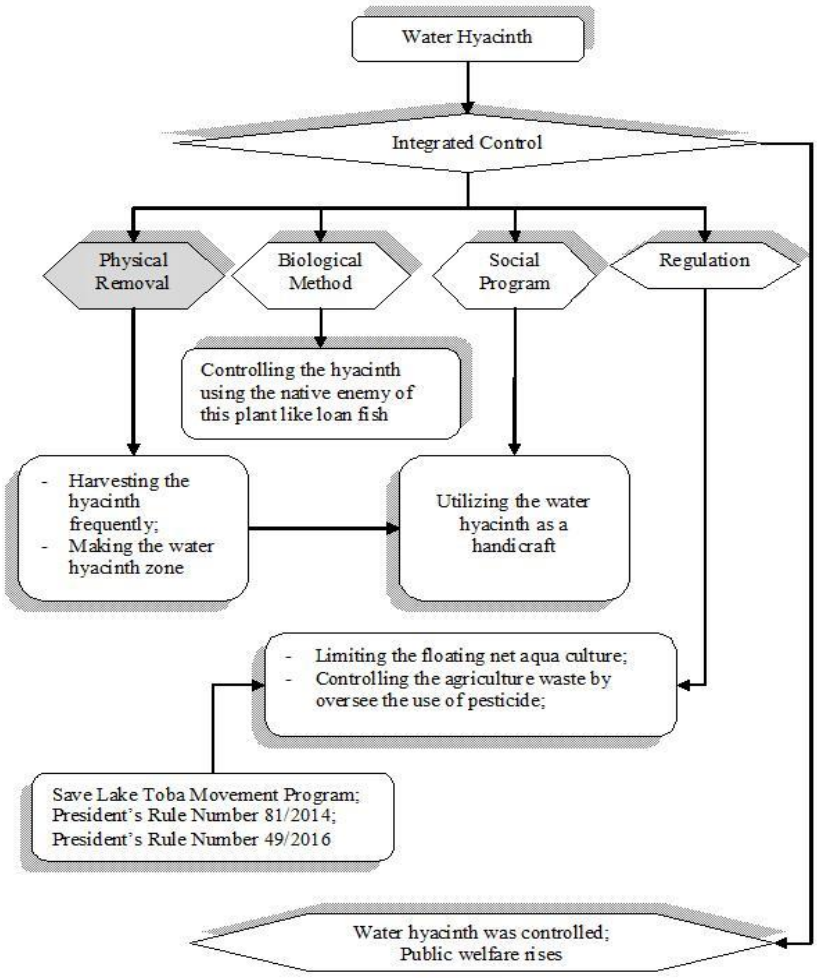

Fig. 2 A model approach of water hyacinth management at Lake Toba, Samosir Regency

4. Conclusion

Based on matrix SWOT analysis, the water hyacinth management plan at Lake Toba Samosir Regency is using Integrated Control with 3 combination methods such as physic/removal method, biological method and social method. And the other way to controlling the water hyacinth at Lake Toba is assign the limitation of floating net aquaculture.

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Urban Greenspace for Resilient City in the Future: Case Study of Yogyakarta City

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Abstract

The capacity of adaptation is essential elements towards urban resilience. One adaptation that can be done is to consider the provision of open space and public space in the city. Yogyakarta City development which focused on the built area and negates the open space has blurred the characteristics of the city. Efforts in increasing the availability of public space is one of the seven priorities of the programs included in the environmental and the utilization of space in Yogyakarta City. An understanding of the provision of public green open spaces in Yogyakarta is important because the products and processes that take place in a development will determine the successful implementation of the development plan. The objectives of this study are as follows: (1) to identify the provision green space in Yogyakarta City from the aspects of product and procedure; and (2) to identify the role of green space to build resilient city. This study is used descriptive qualitative approach with in-depth interview, literature review, and triangulation as the method of data collection. Yogyakarta has had instruments for public green open spaces provision called Masterplan RTH Up-Scaling Yogyakarta 2013-2032. Public green open spaces development mechanism with can be grouped into the planning phase, the deployment phase, and the utilization control phase of each consisting of legal and regulatory aspects, institutional aspects, financial aspects, and technical aspects. The mechanism of green open space provision should regard the need of advocacy for "urban green commons" (UGCs) development as a systematic approach of collective-participatory for urban land management.

Keywords: Resilience; Green Open Space; Mechanisms; Yogyakarta

1. Introduction

The capacity of adaptation are essential elements towards urban resilience. The provision of open space and public space as a public asset that can minimize negative impacts of climate change in urban areas have to be considered as one of the adaptation [1]. In a resilience framework, one of the criteria for urban resilience is when the city providing green open space as a property of space to maintain the sustainability of socio-cultural, economic, and ecosystem [2]. Investment in urban areas through the provision of diversity biodiversity is believed to be a form of mitigation of natural space to anticipate environmental change phenomenon.

The rapid economic growth in Yogyakarta City, especially in the manufacturing sector, accommodation and restaurants, as well as information and communication led to the city underwent a spatial transformation quite rapidly [3]. The phenomenon of the development of hotels, restaurants and cafes, as well as shopping centers have ignored the existence of urban public space. The availability of green open space still very poor with only fulfilled 17% of the 20% minimum requirement of spatial policy [4]. This condition is quite worrying for the fulfillment of public open space, especially green open space is important to improve the resilience of an urban area through the development of nature-based solutions [5].

Yogyakarta City has made efforts to increase the availability of public space with provision program of public green open spaces to support the activities of urban life. The program is one of the seven priorities of the programs included in the environmental and spatial utilization aspect. In 2016, Yogyakarta City should have developed some locations as a green open space [6,7]. The government's action to increase the number of public green open spaces is the right step to improve the quality of life and environment of Yogyakarta. The process of providing public green open spaces are complex activities in which the mechanism is governed by specific policies, involving the various interested parties, and other activities that mutually influence each other. An understanding of the processes in the supply public green open spaces in Yogyakarta City important to do because the process takes place in a construction activity will

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determine the successful implementation of the development plan. Therefore, efforts to understanding the patterns of integrated and comprehensive in the provision of public green open spaces in Yogyakarta City performed in this study. The purpose of this study is to identify the provision of green space in the city of Yogyakarta, which plays a role in the realization of the resilience of the city. The objectives are as follows: (1) to identify the provision green space in Yogyakarta City from the aspects of product and procedure; and (2) to identify the role of green space to build resilient city.

2. Methods

This study utilized descriptive exploratory qualitative approach to collect the required data and analysis. By using this approach, the researchers had the opportunity to explore and gather information using combined techniques. The methods used to collect data are in-depth interview, literature review, and triangulation. The results will be discussed through description and explanation in accordance with the aims.

3. Results

3.1 Public Green Open Space Plan

Policy development of public green open space Yogyakarta supported by the Masterplan RTH Up-Scaling Yogyakarta 2013-2023 which contains the provision and utilization of green space plan (Fig. 1). Form the document, green open space in Yogyakarta will be developed into some typologies as follows: (1) Residential Building; (2) Courtyard; (3) Offices, Shops, and Place of Business; (4) Roof Garden; (5) Settlement Area in Any Level (RT, RW, etc); (6) Special Areas; (7) City Gate; and (8) Public Green Open Space in the District. Each typologies have citeria for the development of open green space such as vegetation selection, extents standart, and functions.

3.2 The Mechanism of Public Green Open Space Provision

To achieve the ideal conditions based on the spatial aspects for public green open spaces development, the main mechanism of these are in the form of stage planning phase, the deployment phase, and the utilization control phase (Fig. 2). Of the whole process in the mechanisms of public green open spaces development, the elements contained in these mechanisms can be grouped into several aspects include the legal and regulatory aspects, institutional aspects, financial aspects, and technical aspects of operational utilization. The authority of Yogyakarta City for this development process provided by several major public institutions namely Regional Planning and Development Agency (Bappeda), City Government, and the Environmental Agency of Yogyakarta (BLH).

Fig. 1. Map of Plan for Green Open Space in Yogyakarta City [8]

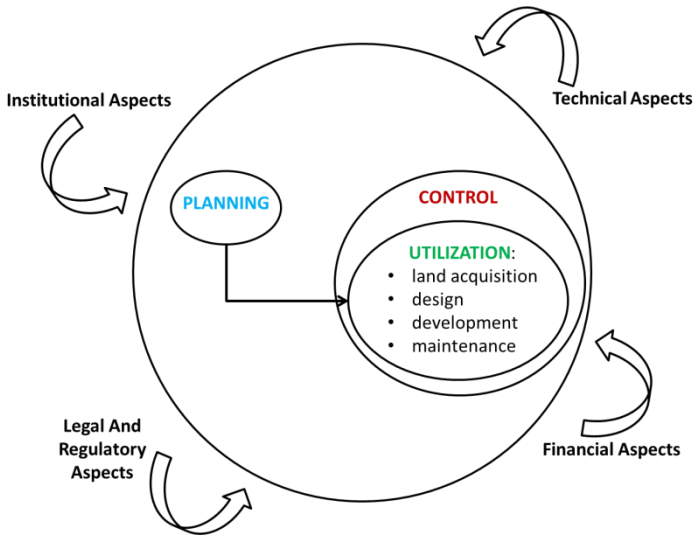

Fig. 2. The Mechanism of Green Open Space Development in Yogyakarta City [8]

3.3 Green Open Space for Resilient City in Yogyakarta

Urban green space offers a unique landscape that supports biodiversity and its benefit for urban citizens. Natural ecosystems in the green open space have an important role and benefits such as health (provide clean air), property, energy (increase water availability, regulate the urban climate), and community (create place making in the city). Maintaining the connection of nature with urban environment is a fundamental, therefore understanding of the benefits would be significant to develop sustainable urban development[5].

As part of major criteria for urban resilience, green open space become one of urban components that have to develop to increase the capacity of urban environment in order to deal with the risk of climate change and disaster. Related to the transition toward resilient city, Yogyakarta City has been in the process of increasing its adapation capacity with the planning and development of green open space. Particularly in the sense of product development, Yogyakarta City with its master plan of green open space has established its foundation for urban green infrastructure development. Nevertheless, the implementation of policy still has challenges from the mechanism of the provision.

From the institutional perspective, the Ministry of Public Work Regulation No. 05/PRT/M/2008 about Guideline for Provision and Utilization of Green Open Space in Urban Area regulate the need of participation of urban stakeholders one of which is legal institution as a non-governmental organization that play a major role for connecting between the community, government, and private sector in overcoming the communication gap and information as well as improving people's access to resources [8]. The procedure of green open space development in Yogyakarta has not been involving and optimizing the advocacy aspect that could contribute to the development of what so-called as "urban green commons" (UGCs) [9]. The concept of urban commons property system would be an alternative to bridge the complexity of green open space provision with more collective-participatory of urban land management. With the role of the legal institution which have concerns with the environmental issues there should be more systematic procedure to mediate and to facilitate between relevant stakeholder in terms of communication, conflicts resolution, learning process, space utilization, and law enforcement.

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Green Sustainable Transportation Mode into Manage Natural Resources Infrastructure Plan on Sulawesi Railway Project Case study: Makassar – Pare-Pare Railway Project in South of Sulawesi Indonesia

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Abstract

Green sustainable transportation mode is the huge basic agenda in the world to solve human, environmental and economic would be growth together on the fluctuated era which natural resource as one of the primary crucial issue to manage the future of transportation mode on earth now. The increasing of people daily need on any regions have been forced one to another people must be chosen one of the best transportation mode to establish the regional connectivity and business modelling by quickly, safety, and delicately. Makassar – Pare-pare Railway Project of South Sulawesi Indonesia has been developed as the fundamental project on Sulawesi island to implement the sustainable transportation frame to cover Sulawesi coridor as the center of production and processing of national agricultural, plantation, fishery, oil & gas and mining. It project has been conducted number of methods were Natural Resource Railway Infrastructure plan, Environmental sustainable transportation mode and Green Economic modelling system which all methods would be integrated on simultaneous approaching transportation system so that would be accommodated commodity met on one point services into finishing some interest between region to another region, efficiency of land use and pollution to connect producer and consumer and also presented another efficiency land transportation mode to fulfill economic efficiency formula that appropriated in South Sulawesi master plan project. Therefore, as the result of this research it would be got the best sustainable alternative transportation mode on Sulawesi Island who will be united all regions and natural resources on one railway infrastructure plan project.

Keywords: Green Sustainable Transportation mode; Natural Resource; Railway; Environmental; Economic

1. Introduction

The successfully of Sustainable nation will show based on the high movement of natural resources which accommodated to fulfill people daily need without the obstacle of transportation on any regions entire in the world[1] . Land transportation has been the dominant alternative mode which connected consumer and producer into make cycle of sustainable system of transportation mode [2]. Daily need, Natural resources and transportation mode on globalization era could not be separated into achieved the environmental sustainable concept which the increasing of people interest has been forced the accessibility of transportation mode should be sophisticated and efficient which agree with sustainable development strategy of transportation infrastructure [3]. Indonesia as the part of the Global Networking which located between both of ocean were Hindia and Pacific and also both of Continent were Asia and Australia would be placed Indonesia to be as hearth of world transportation which Natural resources was the primary power. It position has been brought Indonesia should be prepared master plan economic to divide all region in Indonesia could be integrated on general concept transportation who able to elaborate between big regions and small regions to fulfill human economic development. Sulawesi Island was established as Natural Resources Plan area such as Agricultural, Mining, Fishery, Oil and Gas, and also Industrial Region on East Indonesia [4]. It vision has been made a concept how the natural resources would be moved efficiently from one place to another so that each region would be connected as much as possible. Makassar – Pare-pare railway project as the catalyst project how Sulawesi

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would be set up a new land transportation mode from existing mode which natural resources would be got as efficiently, environmentally, and economic beneficially.

2. Methods

Research Method of Green Sustainable Transportation mode has showed number of methods were Natural Resource Railway Infrastructure plan has been explained the correlation among freight of natural resources in each railway regions namely Makassar – Maros –Pangkep – Barru – Pare-pare, Characteristic area, and Economic Master Plan of railway project, Environmental sustainable transportation has been identified the comparison of dominant land transportation on existing road (Truck 20 Ton) than railway project (Railway Electricity) on research area so that could be founded the comparison value between both of land transportations such as number of unit, Freight of Natural resources, Distances, density area, land use and Emission Content and Green Economic modelling system has been calculated economic value between emission content of land transportation and price of Solar energy in Indonesia so that all methods would be formed an integration data of the best alternative transportation mode who will be implemented on Makassar – Pare-pare area.

3. Results

3.1 Natural Resources Master Plan, Waste Emission, and Transportation on Indonesia

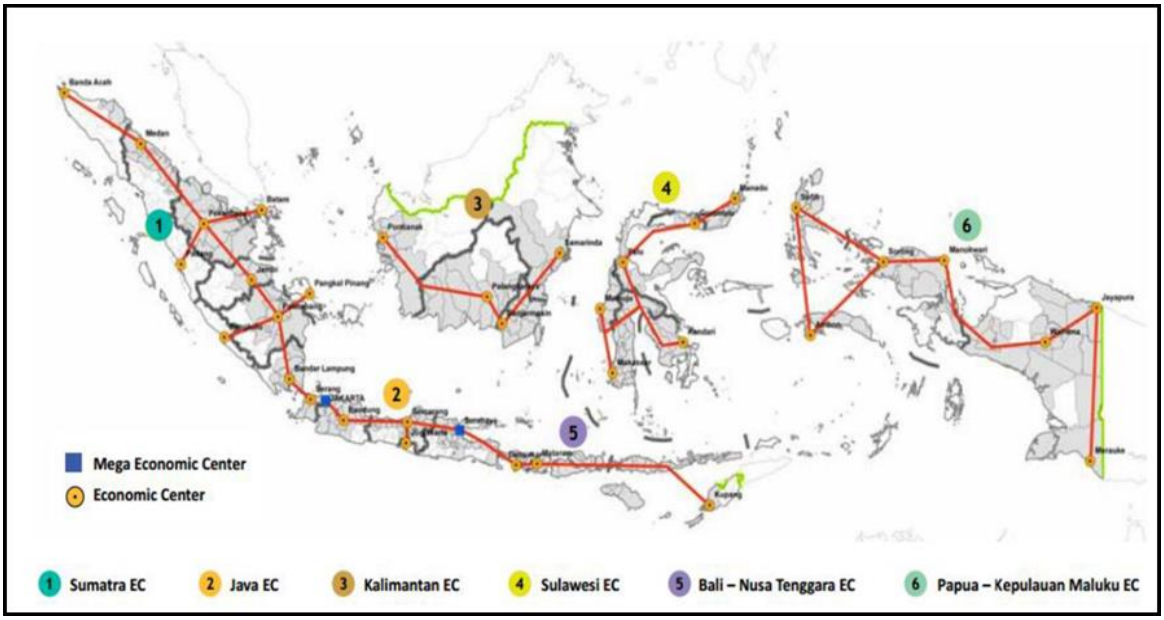

Fig. 3.1 Natural resources distribution based on master plan economic of Indonesia[4]

Table 3.1 Correlation among big Island, Strategic Concept, Waste Emission, and Transport mode emission

Big Island of MP3EI	Strategic Concept	Waste Emission	(%)	Transport Emission	(%)
Sumatera	Center of Production and Processing Natural Resources and Energy Reserves	Transport	27	Others (Pipeline)	0.4
Sulawesi	Center of Production and Processing National Mining and Energy Reserves	Industry	21	Sea and inland waterways	14
Kalimantan	Center of Production and Processing National Mining and Energy Reserves	Energy	34	aviation	12
Papua	Center of development of food, Fisheries, Energy, and National Mining	Households	11	Road Transport	72
Java	Center of National Industry and Service Provision	Services	6.3	Railways	1.6
Bali - Nusa Tenggara	Center of Gateway for Tourism and National Food Support	Other	0.7		

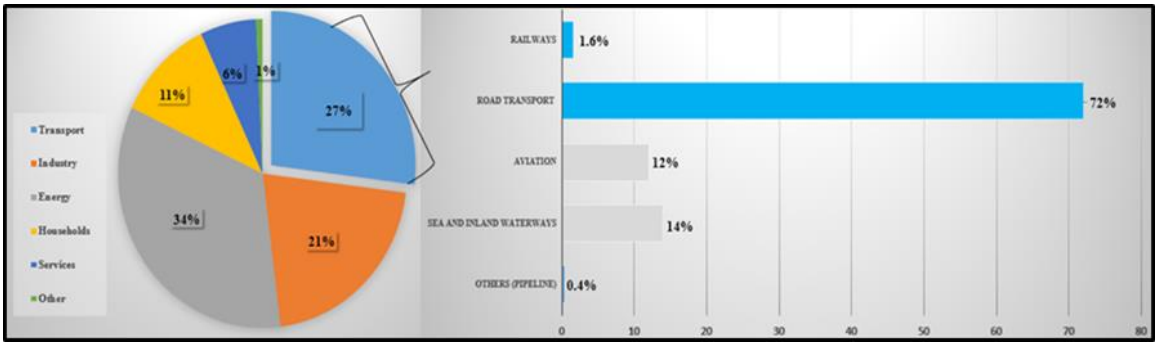

Fig. 3.2 Correlation between Waste management emission and dominant transportation[5]

3.2 Railway Infrastructure Plan of Natural Resources on South of Sulawesi

Table 3.2 Railway Electric VS Truck 20 Ton into Fulfill Natural Resource Target on Segment of Region

Jenis kendaraan	Segment	total unit	Freight (Ton)	Total Freight/route/wagon (Ton)	existing (Ton)	Cycle Time (unit or line)	Actual target (Ton/day)	Plan target (Ton/Day)	Remarks
Truck 20 Ton	Makassar-	40	20	40	800	40	32000	31657	Fullfilled
Railway Electric	Pare-pare	7	20	40	800	42	33600	31657	Fullfilled

Table 3.3 Characteristic of Natural Resources Plan in Makassar – Pare-pare Railway Project

Segment	Natural resources	Region	Station	Segment Characteristic
Makassar	Fishery	Makassar	South Segment (Big Station)	Flat area, beach, no hill and mountain, maximum elevation 25 m (Sea Port)
Maros	Farmer Production	Kec.Mandai	Small Station	flat land by maximum elevation 25 m, national road connected to sea front (makassar strait), there are some hill and mountain (bosowa and Tonaso Cement Company)
	Plantation:	Kec.Maros	Big Station	
	cashew nut	Kec. Lau		
	candlenut	Kec.Maros Utara		
	Fishery: shrimp	Kec.Minasatene		
	mining: Bosowa (Cement/Marble)			
Pangkep	Food plant: lemon	Kec.Pangkajene	Big Station	almost all area a flat area which border by sea level, number of hill by maximum elevation 100 m and minimum elevation 12.5 m on flat area.
	Plantage: cashew nut	Kec.Bungoro		
	Fishery:	Kec.Labankang	Small Station	
	shrimp	Kec.Marang	Small Station	
	Crap	Kec.Segeri Mandalle	Small Station	
	mining: Tonasa (Cement/Marble)	Kec.Mandalle	Small Station	
Baru	Food plant:	Kec.Tenete Rilau	Big Station	Hill area which connected by sea level, national road which connected to sea which located between sea level and hill.
	Corn	Kec.Baru	Small Station	
	Nuts	Kec.Balusu		
	Plantation:	Kec.Sopeng Riaja	Small Station	
	cashew nut	Kec.Mallusetasi		
Pare-pare	Fishery	Pare-Pare	North Segment (Big Station)	Sea Port

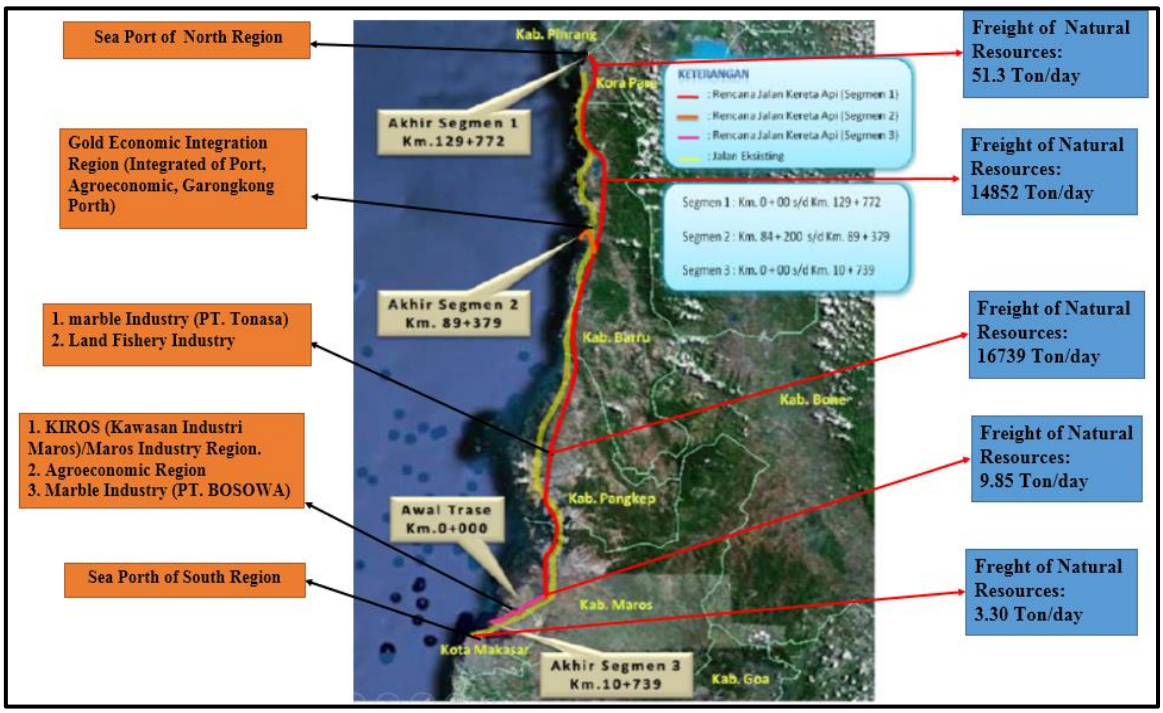

Fig. 3.3 Master plan of Natural Resources Corridor Makassar – Pare-pare Railway project

3.3 Environmental Sustainable Transportation Identification

Table 3.4 Petroleum Combustion Parameter of Energy Content on South of Sulawesi[6]

Unit	Source of energy	Number of energy content	Value of Energy Content (MJ/l)	Machine Combustion of Land Transportation
Truck 20 Ton Railway Electricity	Petroleum product (Oil, Gas and Coal)	Aviation gasoline	33.62	Diesel
		Motor gasoline	34.66	
		Kerosene	37.68	
		Diesel	38.68	
		Light Fuel Oil	38.68	
		Heavy Fuel Oil	41.73	

Table 3.5 Railway Electric VS Truck 20 Ton into Calculation land use, Density and Emission Content

Land transportation	Total Unit	Fuel Consumption (L/Km)	Energy Content Solar (MJ/L)	Cycle time (Unit atau Line)	Distances (Km)	Widht (Km)	Land Use (Km2)	Density of Unit (Unit/Km2)	Emission Content (MJ/Km)
Railway Electricity	7	1.2	38.68	42	145	0.015	2.175	3.2	292802.6
Truck 20 Ton	40	2.8	38.68	40	300	0.008	2.4	16.7	1289333.3

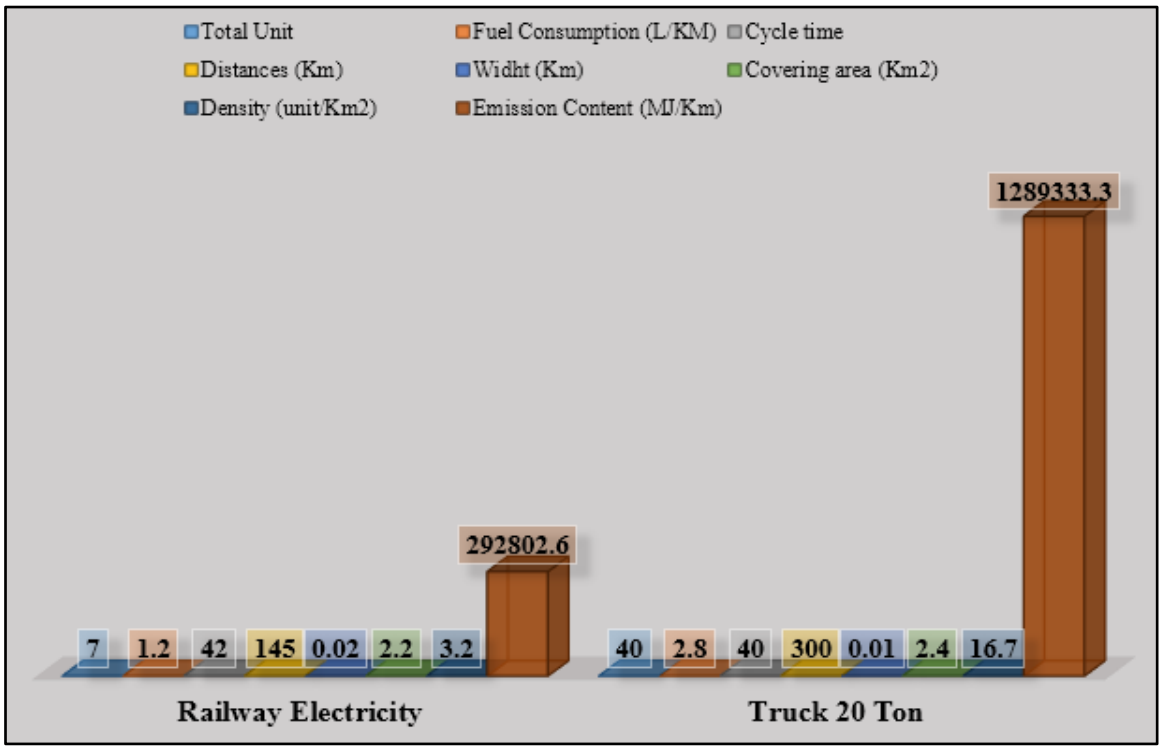

Fig. 3.4 The comparison between Railway Electricity VS Truck 20 ton on energy emission content

3.4 Green Economic of Sustainable Transportation Mode

Table 3.6 Railway Electric VS Truck 20 Ton into Calculation Operation Cost by Solar Consumption

Land transportation	Total Unit	Fuel Consumption (L/Km)	Cycle time (Unit atau Line)	Distances (Km)	BBM Price /L (solar) (IDR)	Unit operation (IDR)
Railway Electricity	7	1.2	42	145	8,200	62,072,934
Truck 20 Ton	40	2.8	40	300	8,200	273,333,333

Table 3.7 Green Sustainable Transportation Mode on Land Transportation

Land transportation	Total Unit	Distances (Km)	Land Use (Km2)	Density of Unit (Unit/Km2)	Emission Content (MJ/Km)	Operation Cost (IDR)	Remarks
Railway Electricity	7	145	2.2	3.2	292802.6	62,072,934	**Best alternative**
Truck 20 Ton	40	300	2.4	16.7	1289333.3	273,333,333	**another alternative**

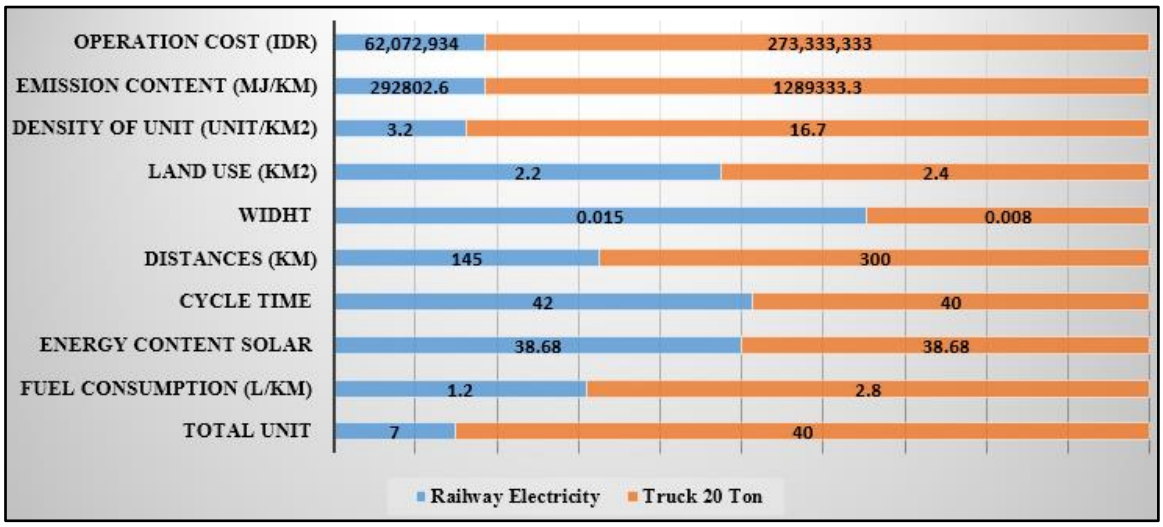

Fig. 3.5 Comparison of best alternative Indicators from Land Transportation of South of Sulawesi

4. Conclusion

Based on Integration data of Green Sustainable Transportation mode could be combined number of indicators which elaborated to develop a railway project infrastructure plan as a new paradigm of land transportation on Sulawesi Island who served a new modelling transportation as the best alternative transportation mode on Makassar – Pare-pare regions in South of Sulawesi Indonesia.

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Enhancing Environmental Management through Fsc Certification in Perum Perhutani Kph Kendal

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Abstract

Forest certification has been introduced in the early 1990s as a market based response for promoting sustainable forest management to address current issues about increasing loss of tropical forest and biodiversity. Perum Perhutani, as a state owned enterprise managing state forests in Java and Madura take responsibility to implement sustainable forest management based on social welfare, economic, and environment. In this research, we identify the implementation results of Forest Stewardship Council (FSC) certification in Perum Perhutani, Forest Management Unit (KPH) Kendal as a case study. Quantitative and qualitative methods were conducted through observation and secondary data from KPH Kendal management. Data analysis showed FSC certification takes important roles in raising awareness on environmental issue through protected areas allocation. Approximately 2,771.2 ha (13.56%) of the total area has been allocated as protected areas, such as e.g. Local Protected Areas (KPS), Secondary Natural Forest (HAS), Arable Areas (TBP), and Specialized Protection Areas (KPKh). Moreover, KPH Kendal allocated 2,715.50 ha as High Conservation Value Forest (HCFV) areas, such as e.g. Secondary Natural Forest (HAS), Natural Springs, Germplasm Protection Region (KPPN), and Cultural site. Monitoring and evaluation of Biodiversity, Sedimentation and Erosion, Reduce Impact Timber Harvesting (RITH), enrichment in protected areas were also applied. Forest certification has proven to be a useful tool in order to enhance environmental management particularly in KPH Kendal.

Keywords: forest certification; Perum Perhutani; environmental management

1. Introduction

Government of Indonesia through Ministry of Environment and Forestry has implemented forest certification since early 1990s. Literature studies mentioned that the most common perspective of certification is a market-based incentive for better management [1]. Through market benefits, forest managers and owners should consider the incentives to produce more costly but their products will give contribution to environment [4]. Forest certification is the process where an independent third-party (certification body) assesses the quality of forest management in relation to a set of predetermined requirements or standard [7]. Maintaining biological diversity and sustainable forest management are the objectives of this certification.

In global market, we could find many green products label with Forest Stewardship Council (FSC) logo. This logo is also widely known as one of certification body in timber and forestry sector of Indonesia [3]. In light of state forests in Java and Madura, Perum Perhutani as state owned enterprise also promotes sustainable forest management through FSC certification since 2003. Perum Perhutani KPH Kendal is one of the eight FMUs have obtained FSC certification in 2011 which forest areas located in Batang Regency, Kendal Regency and Semarang Municipality (Perum Perhutani KPH Kendal, 2015). According to Keputusan Direksi Perum Perhutani 090/KPTS/Dir/2006 concerning with Sustainable Forest Management Certification in Perum Perhutani, forest certification conducted with voluntary basis under FSC scheme (Dir.PPK, 2014).

In this paper, we investigate the assessment of environmental management in Forest Management Unit (KPH) that received forest certification under FSC mechanism. This forest certification is part of corporate responsibility from forest managers or KPH to behave in a socially and ecologically acceptable manner. Recent studies reported that research on forest certification have been done in Indonesia, most of these certification only focusing on social sector and forest industry. Therefore, this is the first paper discusses about forest certification implementation specialize in forest production. This paper addresses some of key questions: how is environmental management through FSC

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certification implemented? does a certified Forest Management Unit (KPH) ensure sustainable of biodiversity within the forest? what kind of environmental benefits could received after forest certification implementation?. We start a research design to evaluate FSC certification in Perum Perhutani KPH Kendal through secondary data observation and conclude by discussing practical implications.

2. Methodss

Perum Perhutani KPH Kendal is one of Forest Management Unit (FMU) under Regional Division of Central Java, with total area of 20,300.58 hectares and classified as teak forest production (Perum Perhutani KPH Kendal, 2015). We conducted investigation and observation starting from November 2016 until January 2017. Overall documents used secondary data observation from both quantitative and qualitative data. Literature reviews on protected areas determination are based on Perum Perhutani KPH Kendal management reports and maps. Monitoring of biodiversity was conducted through biodiversity survey using transect surveys in several locations by scattered methodology throughout forest area based on monitoring and evaluation of biodiversity report. Biodiversity parameters such as vegetation consist of aboveground vegetation, seedling, sapling and fauna consist of aves, mamalia, herpetofauna. According to biodiversity report, the Shannon-Weiner diversity index (H') analysis used to characterize species diversity in a community that accounts for both evenness index and diversity index of the species present.

3. Results

The Forest Stewardship Council (FSC) is an international organization established in 1993 that provides a system for voluntary accreditation and independent third-party certification. In case of Indonesia, the certification standard used FSC Harmonised Certification Bodies Forest Stewardship Standard for the Republic of Indonesia [3]. There are ten (10) FSC Principles that consists of criteria and indicators for each principle: Principle 1. Compliance with laws and FSC principles, Principle 2. Tenure and use rights and responsibilities, Principle 3. Indigenous peoples' rights, Principle 4. Community relations and worker's rights, Principle 5. Benefits from the forest, Principle 6. Environmental impact, Principle 7. A management plan, Principle 8. Monitoring and assessment, Principle 9. Maintenance of high conversation value forests, Principle 10. Plantations. Principle 6, Principle 9 and Principle 10 are the principle that directly related with environment management, which highlighted focus area of this paper.

After we observed the FSC Principle, various data were analysed in order to investigate FSC certification implementation in Perum Perhutani KPH Kendal. According to data observation, the overall results show positive impacts after FSC certification. We begin to investigate the research result with determination of protected area and high conservation value forest (HCVF) area, monitoring of biodiversity and environmental management process to answer the key questions.

3. 1. Determination of protected area and HCVF area

FSC certification implementation in Perum Perhutani KPH Kendal attempted to influence in a better direction particularly related to determination of protected area. As summarized in Table 1, forest area prior FSC certification (2008-2010) KPH Kendal allocated forest area only into two classifications: production area and non-production area. In this case, protected area only divided in the form of local protected area (KPS) and springs include as special area (LDTI). Meanwhile, after FSC certification implementation (2011-2015) KPH Kendal committed to determine 2,771.2 hectares (13,56%) of total area into protected areas such as local protected areas (KPS), Secondary Natural Forest (HAS), Arable Land (TBP) and Specialized Protection Area (KPKh).

Table 1. (a) Forest area classification prior certification; (b) Forest area classification after certification

No.	Forest Classification	Year (Prior FSC Certification)		
		2008	2009	2010
I	**Production Area**			
	a. Teak forest	17,175.88	17,205.08	15,858.88
	b. Non Teak Forest	2,433.20	2,401.50	678.00
	Total	**19,609.08**	**19,606.58**	**16,536.88**
II	**Non Production Area**			
	TBP	62.30	59.80	59.80
	LDTI	347.10	352.10	3,421.50
	Suaka Alam	113.00	113.00	-
	Plot	282.40	282.40	282.40
	Total	**804.80**	**807.30**	**3,763.70**
Total Area		**20,413.88**	**20,413.88**	**20,300.58**

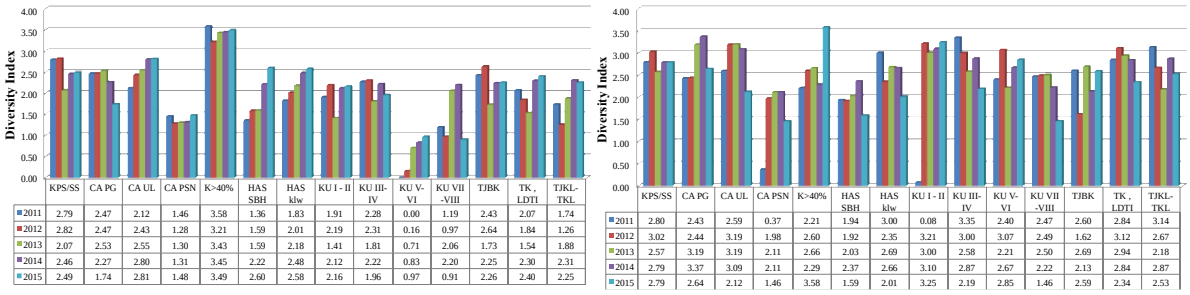
No.	Forest Classification	Year (Post FSC Certification)				
		2011	2012	2013	2014	2015
I	**Production Area**					
a	Production Area	15,948.18	15,970.38	15,960.03	15,969.83	16,071.48
b	Non Production Area	510.70	488.50	491.1	481.1	503.15
	Total	**16,458.88**	**16,458.88**	**16,451.13**	**16,450.93**	**16,574.63**
II	**Protected Area**					
a	KPS	1,532.20	1,532.20	1,532.20	1,600.70	1,600.70
b	HAS	1,102.90	1102.9	1,102.90	1,102.90	1,102.90
c	TBP	59.60	59.6	59.60	59.60	59.60
d	KPKh	86.40	86.4	86.40	8.00	8.00
	Total	**2,781.10**	**2,781.10**	**2,781.10**	**2,771.20**	**2,771.20**
III	**Another Area**					
a	LDTI	568.60	568.60	578.775	588.97	593.09
b	Tourism Area	23.00	23.00	23	22.9	22.90
c	HTKh	378.20	378.20	378.2	378.2	378.20
d	KTn	90.80	90.80	88.375	88.38	88.38
	Total	**1,060.60**	**1,060.60**	**1,068.35**	**1,078.45**	**1,082.57**
	Total Area	**20,300.58**	**20,300.58**	**20,300.58**	**20,300.58**	**20,428.40**

Protected area is one of important requirement to fulfil the criteria and indicator in Principle 6 (Environmental Impact). Table 1 showed the commitment from forest manager, Perum Perhutani KPH Kendal that 10% from the total of forest area should assign to conservation area for biodiversity purpose. In addition to the establishment of protected areas, Perum Perhutani KPH Kendal also developed High Conservation Value Forest (HCFV) area approximately 2,715.5 hectares consists of Secondary Natural Forest (HAS) Subah for monkey habitat, HAS Kaliwungu for deer habitat, HAS Curam for Lutung and Kepodang Habitat, Germplasm Protection Region/ KPPN (leopard habitat), ecology and and culture area (Fig. 1.). HCVF is one of criteria and indicator in Principle 9 (Maintenance of high conversation value forests).

Fig. 1. (a) Secondary Natural Forest; (b) Germplasm Protection Region/ KPPN; (c) Culture site

3.2. Monitoring of Biodiversity

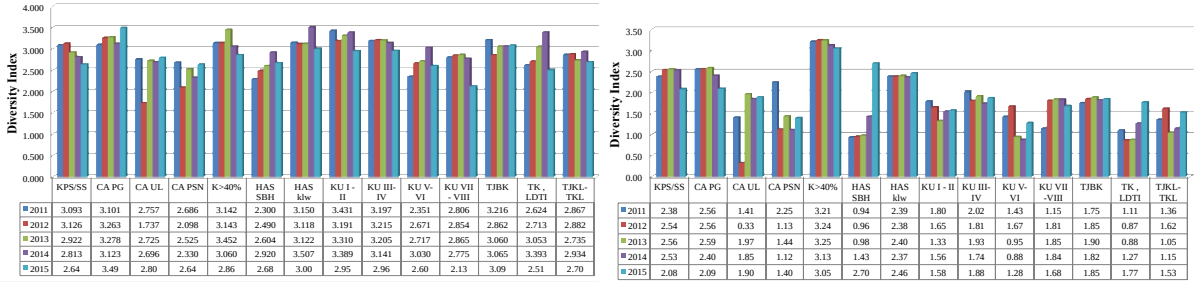
We now turn to the second key question of does a certified Forest Management Unit (KPH) ensure sustainable of biodiversity within the forest. Perum Perhutani KPH Kendal conducted annual monitoring of biodiversity (flora and fauna) to ensure sustainable of biological diversity (Perum Perhutani KPH Kendal, 2015), using transect surveys in several locations by scattered methodology throughout forest area. Monitoring of biodiversity from 2011-2015 showed the evenness and diversity index of vegetation and fauna relatively balanced. The Shannon-Wiener (H') diversity index showed in Fig.2 for vegetation parameter (flora) and fauna parameter. These overall data explain that forest certification is supporting and ensure the sustainability of biodiversity within the forest (FSC Principle 6.)



	KPS/SS	CA PG	CA UL	CA PSN	K>40%	HAS SBH	HAS klw	KU I - II	KU III-IV	KU V-VI	KU VII -VIII	TJBK	TK , LDTI	TJKL-TKL
2011	2.79	2.47	2.12	1.46	3.58	1.36	1.83	1.91	2.28	0.00	1.19	2.43	2.07	1.74
2012	2.82	2.47	2.43	1.28	3.21	1.59	2.01	2.19	2.31	0.16	0.97	2.64	1.84	1.26
2013	2.07	2.53	2.55	1.30	3.43	1.59	2.18	1.41	1.81	0.71	2.06	1.73	1.54	1.88
2014	2.46	2.27	2.80	1.31	3.45	2.22	2.48	2.12	2.22	0.83	2.20	2.25	2.30	2.31
2015	2.49	1.74	2.81	1.48	3.49	2.60	2.58	2.16	1.96	0.97	0.91	2.26	2.40	2.25

	KPS/SS	CA PG	CA UL	CA PSN	K>40%	HAS SBH	HAS klw	KU I - II	KU III-IV	KU V-VI	KU VII -VIII	TJBK	TK , LDTI	TJKL-TKL
2011	2.80	2.43	2.59	0.37	2.21	1.94	3.00	0.08	3.35	2.40	2.47	2.60	2.84	3.14
2012	3.02	2.44	3.19	1.98	2.60	1.92	2.35	3.21	3.00	3.07	2.49	1.62	3.12	2.67
2013	2.57	3.19	3.19	2.11	2.66	2.03	2.69	3.00	2.58	2.21	2.50	2.69	2.94	2.18
2014	2.79	3.37	3.09	2.11	2.29	2.37	2.66	3.10	2.87	2.67	2.22	2.13	2.84	2.87
2015	2.79	2.64	2.12	1.46	3.58	1.59	2.01	3.25	2.19	2.85	1.46	2.59	2.34	2.53

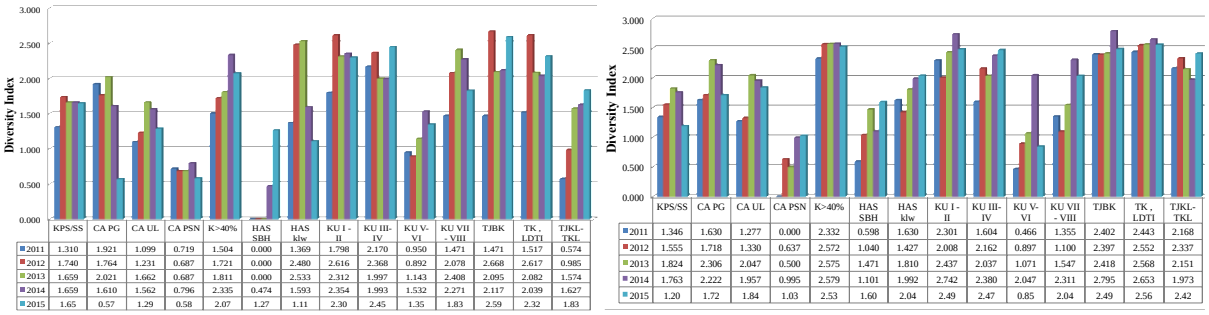
Fig. 2. (a) diversity of aboveground vegetation, (b) diversity of seedling



	KPS/SS	CA PG	CA UL	CA PSN	K>40%	HAS SBH	HAS klw	KU I - II	KU III-IV	KU V-VI	KU VII - VIII	TJBK	TK , LDTI	TJKL-TKL
2011	3.093	3.101	2.757	2.686	3.142	2.300	3.150	3.431	3.197	2.351	2.806	3.216	2.624	2.867
2012	3.126	3.263	1.737	2.098	3.143	2.490	3.118	3.191	3.215	2.671	2.854	2.862	2.713	2.882
2013	2.922	3.278	2.725	2.525	3.452	2.604	3.122	3.310	3.205	2.717	2.865	3.060	3.053	2.735
2014	2.813	3.123	2.696	2.330	3.060	2.920	3.507	3.389	3.141	3.030	2.775	3.065	3.393	2.934
2015	2.64	3.49	2.80	2.64	2.86	2.68	3.00	2.95	2.96	2.60	2.13	3.09	2.51	2.70

	KPS/SS	CA PG	CA UL	CA PSN	K>40%	HAS SBH	HAS klw	KU I - II	KU III-IV	KU V-VI	KU VII -VIII	TJBK	TK , LDTI	TJKL-TKL
2011	2.38	2.56	1.41	2.25	3.21	0.94	2.39	1.80	2.02	1.43	1.15	1.75	1.11	1.36
2012	2.54	2.56	0.33	1.13	3.24	0.96	2.38	1.65	1.81	1.67	1.81	1.85	0.87	1.62
2013	2.56	2.59	1.97	1.44	3.25	0.98	2.40	1.33	1.93	0.95	1.85	1.90	0.88	1.05
2014	2.53	2.40	1.85	1.12	3.13	1.43	2.37	1.56	1.74	0.88	1.84	1.82	1.27	1.15
2015	2.08	2.09	1.90	1.40	3.05	2.70	2.46	1.58	1.88	1.28	1.68	1.85	1.77	1.53

Fig. 3. (a) diversity of sapling, (b) diversity of aves



	KPS/SS	CA PG	CA UL	CA PSN	K>40%	HAS SBH	HAS klw	KU I - II	KU III-IV	KU V-VI	KU VII - VIII	TJBK	TK , LDTI	TJKL-TKL
2011	1.310	1.921	1.099	0.719	1.504	0.000	1.369	1.798	2.170	0.950	1.471	1.471	1.517	0.574
2012	1.740	1.764	1.231	0.687	1.721	0.000	2.480	2.616	2.368	0.892	2.078	2.668	2.617	0.985
2013	1.659	2.021	1.662	0.687	1.811	0.000	2.533	2.312	1.997	1.143	2.408	2.095	2.082	1.574
2014	1.659	1.610	1.562	0.796	2.335	0.474	1.593	2.354	1.993	1.532	2.271	2.117	2.039	1.627
2015	1.65	0.57	1.29	0.58	2.07	1.27	1.11	2.30	2.45	1.35	1.83	2.59	2.32	1.83

	KPS/SS	CA PG	CA UL	CA PSN	K>40%	HAS SBH	HAS klw	KU I - II	KU III-IV	KU V-VI	KU VII - VIII	TJBK	TK , LDTI	TJKL-TKL
2011	1.346	1.630	1.277	0.000	2.332	0.598	1.630	2.301	1.604	0.466	1.355	2.402	2.443	2.168
2012	1.555	1.718	1.330	0.637	2.572	1.040	1.427	2.008	2.162	0.897	1.100	2.397	2.552	2.337
2013	1.824	2.306	2.047	0.500	2.575	1.471	1.810	2.437	2.037	1.071	1.547	2.418	2.568	2.151
2014	1.763	2.222	1.957	0.995	2.579	1.101	1.992	2.742	2.380	2.047	2.311	2.795	2.653	1.973
2015	1.20	1.72	1.84	1.03	2.53	1.60	2.04	2.49	2.47	0.85	2.04	2.49	2.56	2.42

Fig. 4. (a) diversity of mammalia, (b) diversity of herpetofauna

3.3. Environmental Management Activities

There are several environmental management activities conducted by Perum Perhutani KPH Kendal to fulfil the criteria and indicator of FSC certification. In this chapter, we would like to answer the third key question of what kind of environmental benefits could received after certification. Several activities have been conducted such as reduce impact timber harvesting, monitoring of biodiversity, enrichment of protected areas and waste management implementation which support corporate to promote sustainable forest management (SFM). In case of protected areas enrichment, Perum Perhutani KPH Kendal conducted plantations using rimba or local species such as Kepuh (Sterculia foetida), Johar (Cassia Siamea), Beringin (Ficus benjamina), Salam (Syzygium polyanthum), Trengguli (Cassia fistula), Bendo (Artocarpus elasticus), Wungu (Graptophyllum pictum) dan Bambu (Bambuseae).

These environmental management activities are related with the criteria and indicator in Principle 6 (Environmental Impact) and Principle 10 (Plantations) that promote the restoration and conservation of natural forests. After forest certification there are several benefits that received by Perum Perhutani KPH Kendal starting from the internal management improvement, ecological impact through biodiversity monitoring, until supporting the corporate to open access for international market on wood selling.

4. Conclusion

Environmental management through forest certification is one of iniatitve to promote sustainable forest management. FSC certification in Perum Perhutani KPH Kendal support the idea that forest certification ensure sustainability of biological diversity and support environmental management improvement. Our research conclude a preliminary study that will helpful for forest managers (Perum Perhutani) to evaluate the certification scheme implementation in another Forest Management Unit (KPH).

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The 3rd International Conference Planning in the Era of Uncertainty: Sustainable Nation

Bus Network Redesign for Inner Southeast Suburbs of Melbourne, Australia

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Abstract

Public transport is the most effective mode of transport in the era of climate change and oil depletion. Public transport can address the climate change issue by reducing urban greenhouse gas emission and oil consumption as well as improve mobility. However, the existing Melbourne's bus routes are not effective and create high operating costs with low frequencies and occupancy. Therefore, there is a need to improve the network of public transport in Melbourne. This study used network-planning approach to redesign the bus network in the City of Glen Eira, specifically in the area between Gardenvale North and Oakleigh Station, and between Caulfield and Patterson Stations. This area needs network improvements mainly because of the meandering bus routes that run within this area. This approach aims to enhance the performance of bus services trough reducing meandering routes, improving transfer point design, implementing coordinated timetables and enhancing signage and way finding. This study intends to propose a 'ready-made' concept that can increase the bus occupancy. This approach can be implemented in other cities with similar problems and characteristics including the ones in Indonesia.

Keywords: network; bus service; inner suburb.

1. Introduction

Public transport is the most effective mode of transport in the era of climate change and oil depletion. Public transport can address the climate change issue by reducing greenhouse gas emission, and it also can reduce oil consumption as well as improve people's mobility [1]. Public transport can improve mobility, and it can carry a large number of passengers with different destinations from anywhere in one trip. Therefore, a reliable public transport must be developed. Network planning is one approach that can enhance the performance of public transport and can be implemented in urban areas with different densities [2]. In network planning, the design of the network determines how public transport can run effectively. The idea of this 'ready-made' concept is how to produce maximum public transport services by utilizing minimum infrastructure (lines) and resources [2].

Network planning has been implemented in some North American and European cities. It is evident that this kind of multi-destination approach has performed better than the direct route approach [2]. The European Verkerhrsverbund (EVV) is one example of a good implementation of public transport network planning. This model integrates timetables of different transit modes and provides integrated public transport services in any part of the cities especially in the low-density areas where the transit frequency is low [3]. Furthermore, integration of the grid system of the existing arterial roads network and the development of public transport networks has been implemented in Toronto and Vancouver, Canada [4, 5].

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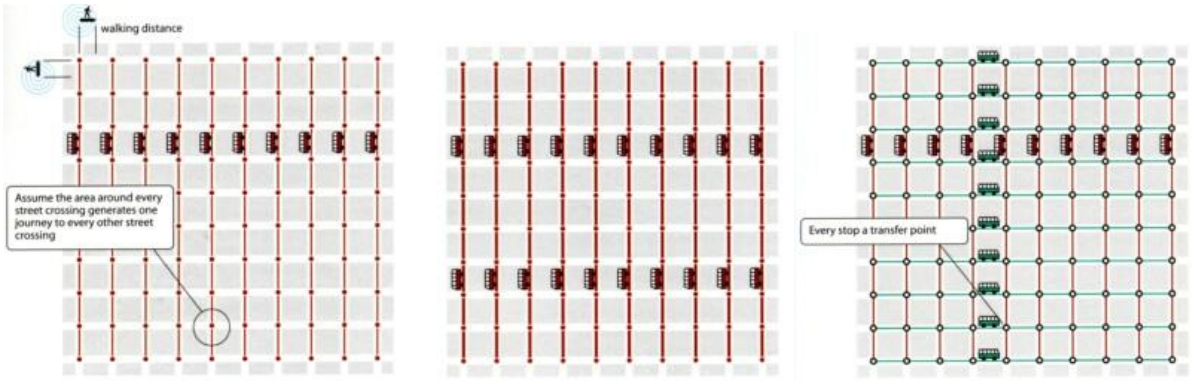

Fig. 1. The squareville diagrams illustrating the network effect [2]

Nonetheless, network planning has not been implemented in Melbourne. Radial routes are the predominance structure of public transport network in Melbourne [2]. Moreover, Melbourne's bus routes are tailor-made, and this may lead to high operating costs and low frequencies [6, 7]. Therefore, there is a need to improve the network of public transport in Melbourne. The grid street pattern of many areas of Melbourne enables the adoption of the multi-destination network from Squareville concept (Mees et al., 2010).

2. Methods

The study area of this plan is located in the City of Glen Eira in Melbourne's Inner Southeast. Specifically, this area is located between Gardenvale North and Oakleigh Station, and between Caulfield and Patterson Stations. This area needs network improvements mainly because of the meandering bus routes that run within this area (625, 626, 701 and 822). In terms of land use, residential area is predominant in this study area. The aim and objectives of this study are based on a field observation that has been done in the City of Glen Eira in 2015. The issues were found in the field observation were prioritised by using analytical hierarchy process (AHP).

The analysis of existing bus service provision utilises an online database from Public Transport Victoria (PTV) website. The calculations of public transport service kilometres combine the data of routes lengths from the Glen Eira local area map and service frequency from service timetables. The following formula is used to calculate the service kilometres.

$$\text{Total service-km} = \sum(\text{route length within study area x number of services in either direction})$$

This formula was used to calculate the service supply of buses, trams and trains within the study area on the entire week including the weekdays (Monday-Friday) and weekends (Saturday-Sunday).

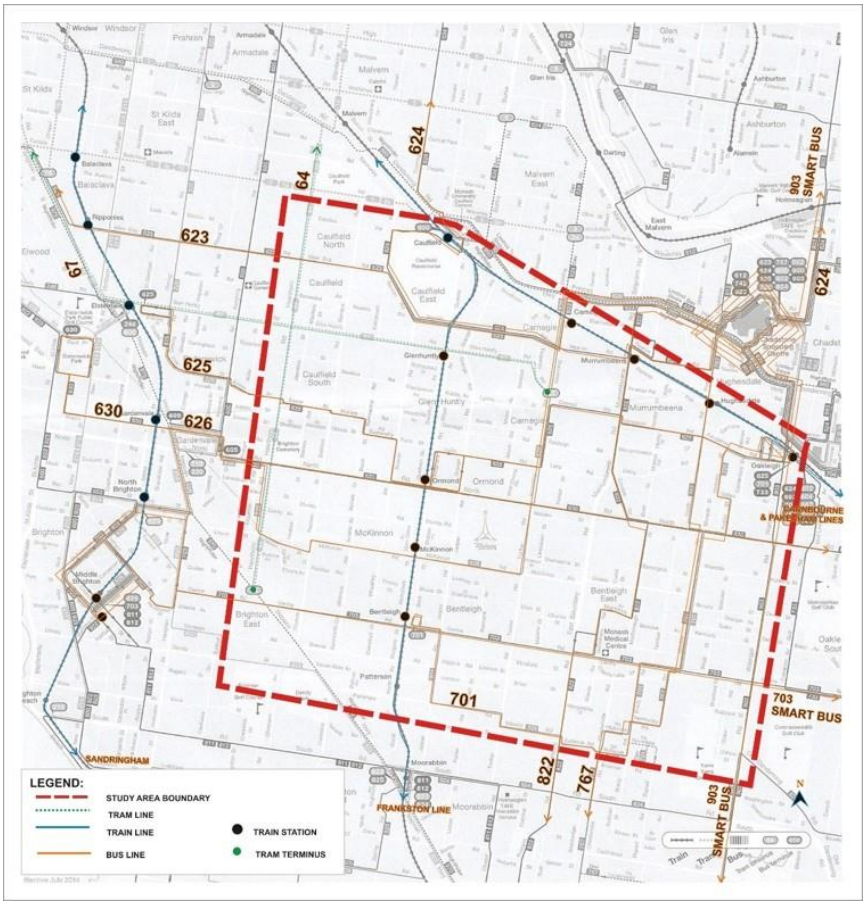

Fig. 3 The Study Area (PTV, 2015)

3. Results

This section consists of three parts. The first part is the identification of the key trip generators inside and around the study area, and how the existing public transport connects to these generators. The second part specifically analyses issues regarding four meandering routes that are the main concern in this study. The third part provides statistics regarding the public transport patronage in this study area.

3.1. Description of the Exisitng Service Supply

The main external trip generator of this study area is the Chadstone Shopping Centre. The majority of the bus services connect the residential areas with this shopping centre. Another important trip generator outside the study area consists of parks, hospitals, educational institutions and other smaller shopping centres in Middle Brighton and Oakleigh. Inside the study area, train stations and tram terminus points are the major trips generators. Some of these stations also have activity centres and retail strips that are also trip generators.

Meandering bus routes and long waiting times are the main issues. This section provides detail explanation about these issues. Firstly, there are four meandering bus routes run within the study area. They are route 625, 626, 701 and 822. These kinds of tailor-made routes are not effective in terms of operational effectiveness and not attractive for passengers because they do not accommodate directness of travel and high speed operating time [8]. Moreover, there are several areas where bus routes are overlapping, and they are obviously not effective. These issues are depicted in the following map.

Secondly, the long waiting times and transfer time issues were also mentioned in the community consultation. Based on the timetable of bus lines running in this study area, the average frequencies are mostly 20 to 30 minutes from Monday to Friday. Only the Smart Bus Route 903 has 10-15-minute frequencies (Table 2.1). According to Mess (2010), public transport services must have a minimum 10-minute frequency during weekdays, especially during peak hours. Furthermore, the timetable of the existing bus services shows that the frequencies

are further reduced on weekends. The buses mostly run at frequencies of 30 min to 1 hour. This should be no more than 30 minutes during low demand period [4, 9].

3.2 Buses Patronage tatistics

Based on bus patronage growth data, most of the bus routes operating in the study area increased their patronage. Only two routes, 630 and 822, had significant decreases in patronage on both weekdays and weekends. Furthermore, the patronage of Route 701 increased significantly; by about 20% in terms of annually and average weekday, but its patronage in the weekend slightly decreased. Additionally, patronage of Smart Bus routes, 703 and 903, grew slightly by no more than 10%, but they also decreased slightly in terms of average weekend use. This data depicts the need of public transport network improvement to foster the patronage growth as well as address patronage decrease on some bus routes.

3.3 Quantification of existing public transport service supply within the Study Area

The calculation of the existing service provision is based on the service kilometers in a week (Monday to Friday, Saturday and Sunday). The main focus of this calculation is the service kilometer of the bus service. The proposed bus network discussed in the next section should not exceed the existing service kilometer to ensure the minimum cost of this proposed network. The service kilometer of the existing bus service in the study area is roughly 25,663 service kilometer (s km) per week, 4,355 s km per day on weekdays, 2,109 s km on Saturdays and 1,776 s km on Sundays.

3.4 Recommendation

This study proposes a new public transport network that is integrated and effective in Melbourne's Inner Southeast. This aim can be broken down into two main objectives; to implement network effect concepts and to create coordinated timetables and as frequent services as needed. These objectives intend to address the main issues mentioned in the community consultation. Firstly, a more effective network can replace the meandering routes so that the network effect can be created. Secondly, integrating rail-bus and bus-bus transfer time can address the long waiting time issue. Furthermore, this issue can be addressed by providing more frequent bus services.

Furthermore, these objectives are actually included in the operational principle of network planning. It consists of integration of different modes, simple line structure, accommodation of direct and multi-destination routes, and timetabling management [2, 8]. Brown and Thompson [10] suggest that integration between train and bus services improved transit performance in the US. The objectives can be measured according to several indicators such as a rail-bus coordinated timetables and minimum 10 minutes time transfer [9]. Moreover, an effective network is obtained by having a grid network that reduces meandering routes, increases operating speed and achieves maximum operating efficiency [8, p. 186].

4. Conclusion

The meandering routes and uncoordinated timetables are the main public transport issues in Melbourne's Inner Southeastern Suburbs. This study intends to address these issues by creating easy transfer mainly through implementing coordinated timetables and establishing a good public transport network to create a network effect as mentioned in the Squareville model. Furthermore, these objectives will be achieved by utilizing the existing resources (service kilometre). This study also suggests that improvement of transit stop design will foster the proposed coordinated timetables and bus network.

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The 3rd International Conference Planning in the Era of Uncertainty:
Sustainable Nation

Development of a Solar-Powered Electric Bicycle in Bikesharing Transportation System

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Abstract

The increasing mobility has directly led to deteriorating traffic conditions, extra fuel consumption, increasing automobile exhaust emissions, air pollution and lowering quality of life. Apart from being clean, cheap and equitable mode of transport for short-distance journeys, cycling can potentially offers solutions to the problem of urban mobility. Many cities have tried promoting cycling particularly through the implementation of bike-sharing. Apparently the fourth generation bikesharing system has been promoted utilizing electric bicycles which considered as a clean technology implementation. Utilization of solar power is probably the key developments in the fourth generation bikesharing system and will become the standard in bikesharing system in the future. Electric bikes use batteries as a source of energy, thus they require a battery charger system whichpoweredfrom the solar cellsenergy. This research aims to design and implement electric bicycle battery charging system with solar energy sources using fuzzy logic algorithm. It is necessary to develop electric bicycle battery charging system with solar energy sources using fuzzy logic algorithm. The study was conducted by means of experimental methodology includes the design, manufacture and testing controller systems. Fuzzy algorithm design results planted in EEPROM microcontroller ATmega8535. The charging current was set at 1.2 Ampere and when the full battery voltage of 40 Volt. The results showed a fuzzy logic controller was able to maintain the charging current of 1.2 Ampere with an error rate of less than 5% around set point. The process of charging electric bike lead acid batteries from empty to fully chargedwas 5 hours. The conclusion that the development of solar-powered electric bicycle controlled using fuzzy logic controller can keep the battery charging current in solar-powered electric bicycle to remain stable. This shows that the fuzzy algorithm can be used as a controller in the process of charging in solar electric bicycle.

Keywords : Transportation; Bikesharing; Solar-Powered Electric Bicycle; Fuzzy logic

1. Introduction

A bikesharing system is a short-term rental scheme allowing bicycles to be collected and returned at any one of several self-serve stations. It enables commuters to flexibly use bicycles without incurring the cost and trouble of owning and maintaining them. There has been rapid growth in bikesharing systems, and apparent success in attracting riders. In recent years, bikesharing systems have spread throughout the World. Until Mei 2011, there are 136 bike-sharing programs with an amount of bikecycle of more than 237,000 in cities around the world [2]. Recently, many cities have implemented third generation public bikesharing systems. These new bikesharing systems overcome many of the operational problems associated with older bikesharing programs that operated with free or coin-deposit bicycle use. Third generation bikesharing systems have docking stations to rent and return bicycles also use key smartcards for access to a bicycle. While these enhancements to bikesharing technology have enabled their success of bike sharing programs. In Europe, the deployment and expansion of third generation bikesharing schemes in recent years has been rapid, and is now approaching market saturation. Currently, the fourth generation bikesharing system has been promoted which utilizes electric bicycles and clean technology implementation. Utilization of solar power is probably the key developments in the fourth generation bikesharing system and will become the standard in bikesharing system in the future [2]. The fourth generation bikesharing program will use a solar-powered electric bicycle as the main vehicle. Electric bikes use batteries as a source of energy, thus they require a battery charger system which powered from the solar cells energy.

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1.1. Bikesharings

Bikesharing program is a bike user community network where it is distributed around town at low cost. Bicycles can be borrowed at any time at the nearest bike station and can be returned to a bike station to another so bikesharing program ideal for transport from point A to point B. To use a bicycle, a person must register as a member and using the card members, users simply swipe the card members to make the process bicycles [3].

At present, the fourth generation has been integrated with other modes of public transport and utilized clean technologies. Utilization of clean technologies including solar power will likely become the standard in the future of bikesharing system [2].

2.2. Fuzzy Logic

A basic configuration of a fuzzy logic system consists of four main components, namely a device fuzzification, knowledge base, decision making and logic devices defuzzification. This fuzzy controller consists of two input variables and one output variable. The input variables consist of the error (Error, E) and the change of error (change of Error, CE). The concept of fuzzy logic was first introduced by LotfihZadehwhich can be used for handling and processing of linguistic information. Since 1980 Fuzzy Logic Controllers (FLCs) has been successfully applied with success in the industry [4], process control, image processing, motor control, the automatic operation of the trains, camcorder autofocusing, servo motors control, aircraft control, setting spacecraft position and others.

A major factor in FLC are:

- The value of the inputs and outputs as well as the universe of discourse (universe of discourse) input and output,
- Scaling factor input-output variables,
- Fuzzy membership function used in the preparation of fuzzy values for each variable input-output, and
- Rule base.

2.3 Photovoltaicand Charging System

Photovoltaic system (PV) is an equipment that is capable of converting solar energy into DC electrical energy. Solar cells become a source of the most important renewable system that offers many advantages such as it does not require fuel, produces no pollution, low maintenance costs and produces no noise. The solar cells systemis a promising renewable energy source in many tropical countries, where the sun energy irradiation does not fluctuate too high throughout the year and radiates about 12 hours a day. Solar energy received in one day (solar insolation or solar irradiation) can vary from 0:55 kWh / m (2 MJ/m) in a cool area until 5:55 kWh/m (20 MJ/m) in the tropics [5].

Bike sharing system proposed in this paper can beillustrated in Figure 1, which consists of photovoltaic, boost converter, buck converter, microcontroller, current and voltage sensor, and battery. Photovoltaic convert solar energy into DC voltage and the buck converter generates a voltage output that is lower than the input voltage by the PWM pulse that is given to the IGBT switches. While the microcontroller has a function as PWM generator for generating PWM signals by adjusting the duty cycle. The output voltage is generated depending on the duty cycle of the PWM signal given to the IGBT. Current and voltage sensor will detect current and voltage that flow topower storage. Fuzzy Logic Controller (FLC) role is for controlling the value of the PWM signal. FLC inputs are the voltage error, the voltagedelta error, the current error, and the currentdelta error. These inputs are used to determine the amount of PWM value.If the battery is full, microcontroller will disconnect power storage from the buck converter.On the other hand, there is a boost converter that serves as a charger circuit for electric bicycles. Boost converter circuit produces a higher voltage than the input voltage from power storage so that current can flow from the power storage to the electric bicycle batteries.

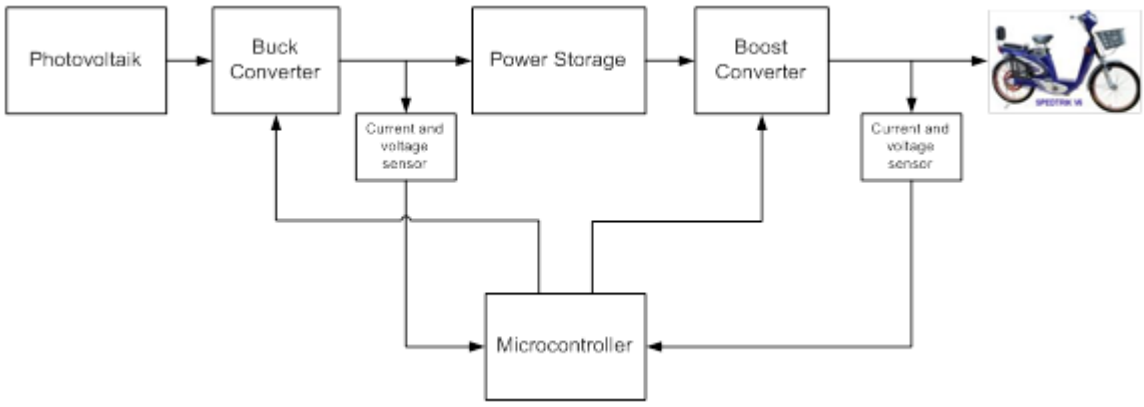

Figure 1. Block diagram system

2.3 Design of Buck Converter and Boost Converter

A buck converter is a DC to DC converter which provides a lower output voltage than the input voltage. Buck converter circuit on a bike sharing system is connecting the photovoltaic and power storage, as shown in Figure 2 that consists of inductor (L), IGBT as a switch, diode and capacitor as filter.The working principle of a buck converter is as follows,during the interval when the IGBT is on, the diode in Fig. 2 become reverse biased and the photovoltaic provides energy to the power storage as well as to the inductor. During the interval when the IGBT is off, the inductor current flows through the diode, transferring some of its energy to the power storage.

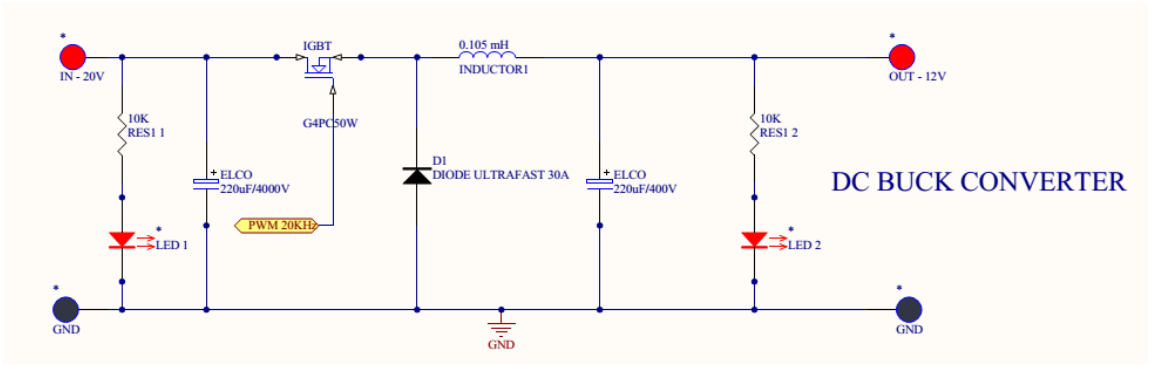

Figure 2. Buck converter for bike sharing

A boost converter is a DC to DC converter which provides a higher output voltage than the input voltage. Boost converter circuit on a bike sharing system is connecting the photovoltaic and battery, as shown in Figure 3 that consists of inductor (L), IGBT as a switch, diode and capacitor as filter. The working process of a boost converter to raise the voltage is divided into two modes, the first mode when charging the inductor current (IGBT on) and the second mode is re-charging inductor (IGBT off).

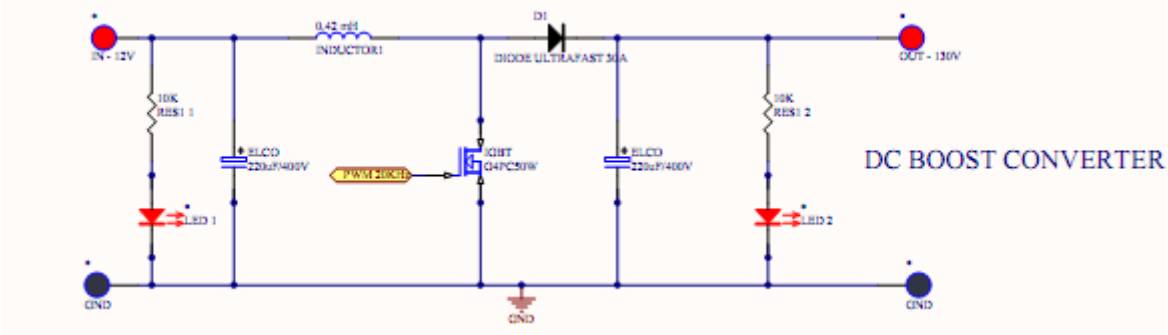

Figure 3. Boost converter for bike sharing system

In the first mode, the inductor will be short circuited with the source. Because all the current flowing through the switch to a negative source, the current flowing to the load can be ignored. Load voltage (Vb) will be zero when the charging process so that the inductor voltage (VL) will be equal to the voltage source (Vs) which can be expressed by.

$$Vs = L\ \frac{dl}{dt} \qquad (1)$$

Since switch is on and duty cycle is on, dton eq (1) can be changed by ton and di = ΔI so that eq (1) can be expressed by

$$V_s = L\ \frac{\Delta I}{t_{on}} \qquad (2)$$

When the switch is in the open position, the voltage source is coupled to the series inductor and load that it causes inductor in discharge state. In this condition, the inductor acts as a current source to supply the load. In this mode, the load is supplied from two sources, namely from the input source and the inductor discharge, the condition which causes the output voltage is always greater than the input voltage. The time span switch on and switch off will affect output voltage that is produced. If the phase switch on time then the longer the charging process, so that when the switch off voltage adders of the inductor becomes larger. The relationship between the input voltage and the output of the boost converter can be expressed.

$$V_R = V_S\ \frac{1}{(1-D)} \qquad (3)$$

Boost converter is used to raise the voltage of the photovoltaic for battery charging. In this paper, bike sharing system using photovoltaic with 20Volt maximum output voltage range, input voltage 12 V 60Ah battery and a switching frequency of 20kHz. Inductor value used in this circuit depends on switching frequency (f), duty cycle (D) dan load resistance (R) that can be expressed by

$$L_{min} = \frac{D(1-D)^2 R}{2f} \qquad (4)$$

While capacitor value is determined by ripple (ΔV) that can be expressed by

$$C = \frac{D}{R(\%\Delta V)f} \qquad (5)$$

3. Results

This research aims to design and implement electric bicycle battery charging system with solar energy sources using fuzzy logic algorithm. It is necessary to develop electric bicycle battery charging system with solar energy sources using fuzzy logic algorithm. The study was conducted by means of experimental methodology includes the design, manufacture and testing controller systems. Fuzzy algorithm design results planted in EEPROM microcontroller ATmega8535.

The charging current is set at 1.2 Ampere and when the full battery voltage of 40 Volt. The results showed a fuzzy logic controller is able to maintain the charging current of 1.2 Ampere with an error rate of less than 5% around set point. The process of charging electric bike lead acid batteries from empty to full takes times about 5 hours.

4. Conclusion

The conclusion that the development of solar-powered electric bicycle controlled using fuzzy logic controller can keep the battery charging current in solar-powered electric bicycle to remain stable. This shows that the fuzzy algorithm can be used as a controller in the process of charging in solar electric bikecycle. So that the solar-powered electric bicycle system developed can be applied to the program bikesharing to reduce traffic congestion which is a prevalent problem in many cities around the world.

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The 3rd International Conference Planning in the Era of Uncertainty:
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Assessment of Environmental Carrying Capacity Tambaklekok Village

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Abstract

Tambaklekok Village is targeted as the urban district which has a function as a residential service center, but has not been supported yet by adequate settlement infrastructure network, such as access to clean water is still limited. This indicates the low ability of resources and environmental infrastructure (carrying capacity) in support of the existing life. This study aimed to assess the environmental carrying capacity of village settlements of Tambaklekok. In the Ministerial Regulation of Environment No. 17 / 2009 the carrying capacity of the environment is divided into supporting capacity and assimilative capacity but only discussed in this research supporting capacity. Capacity assessment of Tambaklekok Village neighborhood used the land capacity, capacity of clean water availability. Results obtained a surplus of land capacity and capacity of clean water supply deficit. Based on the results of the environment capacity as a whole, the level of carrying capacity of Tambaklekok village is a deficit, with an area of 21,9 hektare residential areas. it means the environment ability and environmental infrastructure existing have exceeded.

Keywords: carrying capacity; environment; settlements

1. Introduction

Lekok sub-district is one of coastal areas in Pasuruan district which has the population settlements along its coastline. The settlements around the coastline of Lekok sub-district are not supported by adequate infrastructure, this can be seen from not maximal the service of settlement facilities, between facilities and infrastructures of settlement, so the residential areas, particularly in Lekok sub-district which is located in the seaside classified as slums. 50.61% of Lekok sub-district residents still use the river as a facility for defecation (Lekok sub-district in Number, 2013). This can be seen from the small number of houses are equipped with MCK (bathing, washing and toilet) and 50-70% of houses do not have adequate sanitation [3]. Yet, there is not waste management facilities in Lekok sub-district such as rubbish bins and TPS (waste transfer station) in the residential area [3], so the household wastes which are generated daily are thrown in an open environment without through the processes beforehand. The access to drinking water is still very low, marked by 55-75% population which have not been served with clean water (Nashikhudin, 2011).

Tambaklekok village is an area in Lekok sub-district, so this research is focused on the administrative area of Tambaklekok village as a research study area. Tambaklekok village is one of villages which directly adjacent to the sea (Madura strait) or coastal villages in Lekok sub-district. Based on RTRW of Pasuruan regency 2009-2029, Tambaklekok village will be driven as urban area of Lekok sub-district.

The settlement of Tambaklekok village is not yet been supported by adequate infrastructure, due to the need of clean water is still supplied from Jatirejo village (the interview of village authorities, 2013). The rubbishes are still managed by individual (burnt and or dumped into rivers and beaches). The indications of settlements and utility networks are inadequate, also supported by the fishy situation, rubbishes dumped and scattered on the waterfront, as well as the habit of some people who defecated on the waterfront [5].

This situation in the settlement of Tambaklekok village cannot meet the needs of living expediently and yet have not been able playing as an urban area, as stated in RTRW of Pasuruan regency 2009-2029. The purpose of this study is to assess the environmental support capability in the settlement of Tambaklekok village and give the

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recommendations regarding the conditions of environmental support capability in Tambaklekok village settlements, Lekok sub-district, Pasuruan regency

This makes the neighborhood in the village of Tambaklekok have not been able to meet the needs of decent living and not be shot as urban areas as listed in the Spatial Plan of the Pasuruan Regency Region 2009-2029.

2. Research Objective

The purpose of this study to assess the environmental capacity Tambaklekok village settlements. This measure consists of the carrying capacity of the land and resources to support the availability of clean water.

3. Method

3.1 Method of Collecting Data

Data collection method involves primary and secondary survey. The primary survey includes direct observation and interview.

Interview is aimed at the key informants who know about the required data. The key informant is the village authorities, such as the village chief and the head of Government Affairs of Tambaklekok village. The secondary survey is intended to relevant instances like Bappeda Pasuruan regency.

3.2 Research Variable

In the study of environmental support capabilityin the settlement of Tambaklekok village, the variables used are two aspects of support capability namely supporting capacity including land support capability and drinking water support capability as well as assimilative capacity including the capacity of waste water and the capacity of garbages. It is based on the approach of support capability according to the ministry regulation LH No. 17 in 2009 as well as Khanna in Muta'ali (2012). The scope of study is about comparing all aspects of support capability which are used, so the methods and variables used are explored from the variety source of environmental support capability.

In determining the level of environmental support capability in Tambaklekok village, is used:

a. The land ability is based on the basic physical condition in Tambaklekok village which is the indicators examined including slope, soil texture, drainage, flood threats, the land-effective depth which is overlaid by using Arcgis 9.3. The land ability will be a reference in the allocation of space utilization, particularly utilization for settlement and non-settlement.
b. The land suitability is done after getting the land capability results use Arcgis 9.3. The land suitability is done by comparing between the land capability and the existing land use in Tambaklekok village.
c. The environmental support capability consists of the land support capability, the support capability of drinking water availability, the capacity of waste as well as the capacity of wastewater. Based on the Regulation of the Minister of Environment No. 17 In 2009, the land support capability and the support capability of water availability is the component of supporting capacity. The Capacity of garbage and waste water capacity are the component of assimilative capacity (according to the Khanna’s approach in Muta'ali, 2012). After getting the results of environmental support capability in Tambaklekok village, continuing to score for determining the level of environmental support capability of settlement in Tambaklekok village. From the scoring, it will give the information about the level of environmental support capability in Tambaklekok village, whether its support capability has been exceeded, appropriate or not exceeded yet.

The following is a framework of theories in doing the assessment environmental carrying capacity the village of Tambaklekok.

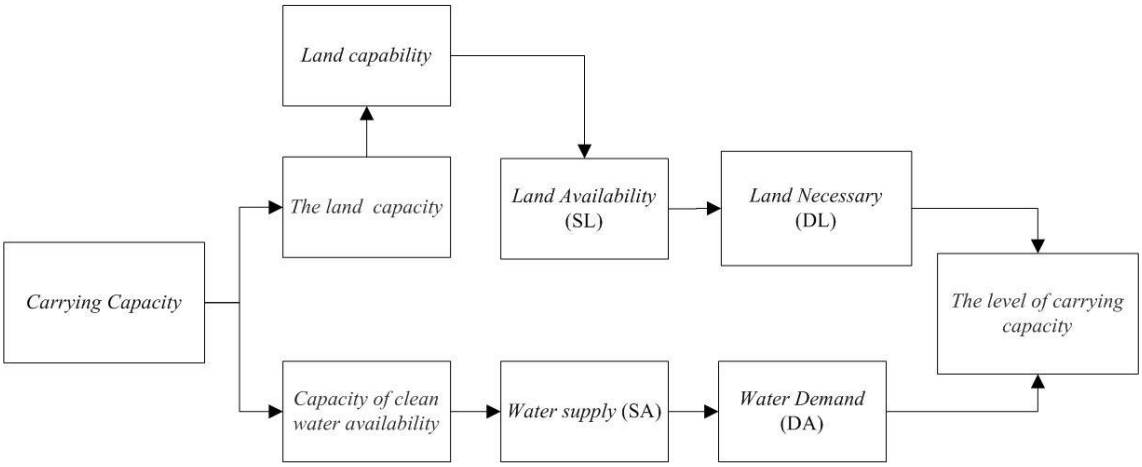

Fig. 1. (a) framework theories [1]

4. Result And Discussion

4.1 Land Support Capability

The land in Tambaklekok village which is included to the III class land has an area of 159 hectares (120 Ha + 39 Ha), or equivalent to 159 x 10,000 m2 = 1,590,000m2. Thereby, based on The ministry regulation PU No. 20 in 2007 the land that can be built settlements is 50% of land that may be covered. The land that can be built settlement 1,590,000 x 50% = 795,000 m2

The house which can be accommodated is built with the assumption that one house has spacious plot around 100m2 in which one house is contained by 5 people. (The ministry regulation PU No. 20 in 2007)

So, based on the land capability in Tambaklekok village can accommodate 795,000 : 100 = 7,950 houses. The inhabitant who can be accommodated by the land ability is 7,950 x 5 = 39,750 people

The number of existing population based on Lekok subdistrict in figure in 2013 were 6,225 people. This means based on the land capability in Tambaklekok village, it can still support the population because the number of people that can be accommodate > the amount of existing population in Tambaklekok village.

The land availability for settlement is 795,000 m2, the land needs of population today is the home 1,539 x 100 m2 = 153,900 m2. The status of land support capability can be known from 795,000 > 153,900, so, the land availability > land requirements or the status of land support capability is surplus (picture 2).

4.2 The Support Capability of Drinking Water Availability

The source water for drinking water use PDAM (the local company of drinking water) from the water springs of Umbulan with rate of flow average around 30 litres / 30 minutes or 60 litres/ 1 hour. In a day, water from PDAM can flow for 12 hours (06.00 – 10.00 hours and 16.00-24.00), meaning that the total of daily flow is 720 litres / 10 hours or 720 litres / day.

The distribution of drinking water is done by using Jerry-cans (similar with bottle plastic) with volume of 30 litres. The price of each Jerry-can is 1,000 IDR. Total of resident's houses who have connection to PDAM around 15 houses. Assumed the entire populations who have no connection PDAM (1,522 houses) are supplied by the residents who have a connection to PDAM. Total of PDAM users in Tambaklekok village that supply the drinking water to 15 customers, then the total debit calculation is as follows

a. Total debit=15 x 720 litre/day=10,800 litre/day
b. watel total debit for MCK=44 x 320 litre/day=14,080 litre/day

Based on the ministry regulation PU No. 14 In 2010, the standard requirement of clean water in Tambaklekok village is 60 litres / person / day. It can be calculated the total of clean water need for Tambaklekok villagers with a total population reaching at 6,225 inhabitants (Lekok sub-district in number, 2013), so:

a. Domestic need = N x KHLA
b. With:

c. N= 6,225 people
d. KHLA= 60 litre/person/day
e. so,Domestic need=6,225 x 60=373,500 litre/day
f. DA = Domestic need + Non Domestic need + water loss
g. DA (Litre/day) = 373,500 + 145,460 + 51,896 = 570,856 Litre/day
h. Availability of drinking water (SA) = 24,880 litre/day

SA < DA (24,880 <570,856), so the water support capability is deficit or exceeded.

By spatial, the distribution of drinking water in each RW Tambaklekok village can be seen in Picture 3 (The Map of Support Capability of Drinking Water Availability). The projection of drinking water needs is conduct by using the approach of population projections that will be converted into the drinking water needs namely 60 litres / person / day (The ministry regulation PU No. 14 in 2010), with the debit total of forecast in 2034 amounted at 503,040 litres / day. The big amount of drinking water needs should be input in the development of drinking water supply system (SPAM) in Tambaklekok village, so it can meet the needs of population in 2034. The availability of drinking water in the base year of projection (2014) is not enough to meet the drinking water needs expediently, so the increase of number of residents who have a direct impact on increasing the amount of water needs need to increase the volume of drinking water availability to meet the needs of Tambaklekok villagers in the future time.

5. Conclusion

Results obtained a surplus of land capacity and capacity of clean water supply deficit. Based on the results of the environment capacity as a whole, the level of carrying capacity of Tambaklekok village is a deficit, with an area of 21,9 hektare residential areas. it means the environment ability and environmental infrastructure existing have exceeded.

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Rice Production Model Based on the Concept of Ecological Footprint

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Abstract

Pursuant to what has been st ated in Malan g Regency R TRW for P eriod 2010 -2030, Malang Regency was consider ed as the cent er of agricultural develop ment, i ncluding sub -districts bordered with Malan g Cit y. To protect the r egion fu nctioning as the provider of r ice production, then the policy o f sustain able food far ming-land (LP 2B) was mad e which its i mplementat ion aims to protect ri ce -land. In the exi sting condition, LP2B Syste m was not maxi mall y executed, and it caus ed a li mited ext end of ri ce -l and to deliver rice production output. One cau se r elat ed with the develop ment of settl ements and industries due to the effect o f M alan g C it y that convert ed land - functi on. Scope of r esear ch fo cused on 30 villages with dir ect border with Malang Cit y. Review was conducted to develop a model o f relation bet ween far min g production output and ecological footprint vari ables. Thes e vari ables in clude rice -land area (X 1), built land percentage (X 2), and number o f far mer s (X 3). Anal ysis technique was regression. Result of r egression indicated that the model o f rice production output Y= -207,983 + 10.246X 1 . Rice- land area (X 3) was the most i nfluential independent vari ab le. It was concluded that o f vill ages dir ectl y bordered with Malang Cit y, there wer e 11 villages with higher production potential because their rice production yield was more than 1,000 tons/year, while 12 villages were threat ened with low production output because its rice production yie ld onl y att ained 500 tons /year. B as ed on the model and the Spatial Order Direction of R TR W, it can be said that the direction for the far ming develop ment policy mu st be redesi gned to maintain rice -l and area on the regions on which agricultural acti vit y was still dominant. It was because the mo st infl uential factor to far ming pr oduction was rice -land area. Ther efore, the wider the rice-land is, the higher rice production output is on each village.

Keywords: ecological footprint; rice production output; rice-land area; regression model.

1. Introduction

Malang Regency was the center of agricultural development in East Java. Through Region Spatial Planning (RTRW) of Malang Regency for Period 2010-2030, productive sub-districts had been organized to maximize the supply of rice production, including sub-districts bordered with Malang City. But rice- land area usually reduced due to the conversion of agricultural-land to other land-uses and sub-distict development as the consequence of Malang City growth. The conversion of agricultural-land into non- agricultural-land was evident by the use of farming fertile land for settlement, industry and other usage (Rustiadi, et al, 2011). Rice-land protection policy to reduce land convertion activity, including sustainable food farming-land (LP2B) in Malang Regency, was not maximally implemented. Conversion against farming-land was a factor behind the scarcity of food derived from farming production output (Rahmanto, 2008). As a result, agricultural-land stock for rice production output would be limited.

Ecological footprint concept was about resource supporting capacity. As noted in a theory proposed by Wackernagel and Rees (1996), ecological footprint was a calculation of biological capacity or resource supporting capacity. Resource support, in this case, was shown by rice production output because, Ekins in Giljum, et al (2007), ecological footprint did not count all natural assets. Ecological footprint covered only natural environment parts but with irreplaceable important functions. Concerning with their regional characteristic, villages that bordered with Malang City must have huge potentials for supplying rice production output

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2. Methods

Type of research was descriptive. Research attempted to investigate and to identify the patterns of development and change of a phenomenon that was still undergone or would be happening. This study focused on the villages in the Malang Regency, which bordering the city of Malang. There are 30 villages used as a location for this study and in accordance with the theory of the Roscoe in Sugiyono (2010) decent sample size in the study were between 30-500 samples and Hair et al (2006) which states that the linear regression can be effective with the amount of data or sample 20 data. Selection of the 30 villages of the 8 district, also based on criteria such as policy direction, the conditions and characteristics of the region so that the data obtained varies.

Classic assumption test serves to determine and examine the variables that are used in accordance with the criteria variables. Its function is to determine the right variables and variables can generate a good regression model. Classic assumption test to be used is normality test, multicoloniarity test and heteroscedasticity test. Normality Test will be using the Kolmogorov-Smirnov with significant value that must be larger than 0.05. Multicoloniarity test by looking at the value of tolerance that must be larger than the value of 0.10 and VIF (Variance Inflation Factor) should be less than 10. Meanwhile, Park method of heteroscedasticity test that takes into account the value of t-test that must be lower than the value of t- table.

Regression analysis is basically the study of the dependency the dependent variable with one or more of independent variables (Gujarati in Ghozali, 2005). Variables used is variable based on the concept of ecological footprint. This concept is also used in regression analysis with the use of regression model that function calculate the supply or availability of resources indicated by the dependent variable of rice production. Multiple regression analysis were used function to see the variables that affect the rice production and regression model can be used in the depiction of the value of agricultural land supply.

Variables for regression analysis were arranged based on ecological footprint. As noted by the concept, resource supply emanated from rice production output of each village. By virtue of ecological foo tprint concept, then theories were made to support the emergence of variables in rice production model.

Y : rice production output (tons) X_1 : rice-land area (hectares)
X_2 : built land percentage (percentage) X_3 : number of farmers (people)
The independent variables and the dependent variable will be analyzed multiple regression using SPSS 16.0 software that simplify the implementation of multiple regression calculation. This calculation also includes the interpretation of model summary and coefficient values. So we get the regression model as follows:

$$Y_1 = a + b_1x_1 + b_2x_2 + b_3x_3 \quad (1)$$

3. Results

3.1. Classical Assumption Test

Classical assumption test in regression models, including normality test, multicollinearity test, and test heteroskedasitas. Normality test on regression model generate significant value of 0.057 and has a value above 0.05. multicoloniarity generate test all variables in regression models have a value of tolerance and VIF appropriate, so the correlation between variables is not proven. Heteroscedasticity test value t table of 2,776 and all of the variables comply heteroskedastidsitas test because the t-test value is smaller than the value t-table. Based on the classic assumption test calculations on the model, all variables have been tested and can be used in the calculation of the regression model.

3.2. Result of Regression Model

The regression model with the dependent variable results for rice production (Y1) has independent variables rice area (X1), the percentage of undeveloped land (X2), and the number of farmers (X3). Based on the calculation of regression model, the R-square value by 56.6%, which can be defined independent variables are used in the calculation of regression model can explain the relationship of influence by
56.6% against the dependent variable, and 43.4% are influenced by other variables not included the independent variables of this study.

Table 1. Result of Model Summary and ANOVA

Model	R	R-square	Adj. R-square	F	Sig.
1	.752	.566	.516	11.302	.000a

The value of F-table on the first regression model was 2.59 and compared with the value F-testis calculated, the value of F table memiiki value is smaller and can be defined independent variables have a significant effect on the dependent variable.

Table 2. Result of Coefficient value

Model	R	R-square	Adj. R-square	F	Sig.
1	.752	.566	.516	11.302	.000a

Model		**B**	**Std. Error**	**t**	**Sig.**	
(Constant)	-207.983	300.865				
Luas sawah (X1)		10.246	1.810	5.659	.000	
Persentase lahan terbangun (X2)		4.227	4.942	.855	.400	Jumlah petani (X3)
	.063	.213	.295	.770		

Based on the calculation of regression model, the variables of rice area (X1) is the most influential variable on rice production (Y1) and will form regression model as follows:

$$Y_1 = -207{,}983 + 10{,}246x_1 \quad (1)$$

Rice-land area (X_1) had a coefficient of determination of 10.246 with positive effect (+). It means that each hectare of rice-land will have 10.246 tons of rice production. Every increment of 1 Ha rice-land may increase rice production into 10.246 tons. The constant was -207.983 with negative load (-). The constant itself was a regression value reflecting a determination coefficient rate of independent variable. It means that if rice-land width is 0 or, in the case of a village without rice-land, there will be a deficiancy for rice production output by an average of 207.983 tons.

3.3. Simulation of Regression Model

The simulation of regression model was aimed to attest the model and also to examine villages with potential for supplying rice production output. Because regression model was created with rice-land area (X_1) as the influential variable, then rice production output was measured from regression model. Simulations using regression model and existing data of rice-land area in each village. Based on the calculation model, will be obtained results of Rice Production (tons) The area constituted by rice -land in each village. The following findings regression calculation Simulation Model.

Table 3. Simulation of Regression Model

No	Districts	Villages	Rice-land Area	Rice Production	Result of Regression
1		Karangwidoro	46,00	286,58	263,33
2		Kalisongo	19,00	118,37	-13,31
3	Dau	Tegalweru	29,00	180,67	89,15
4		Landungsari	54,00	336,42	345,30
5		Mulyoagung	40,00	249,20	201,86
6		Tegalgondo	179,40	1.376,00	1.630,15
7	Karangploso	Kepuharjo	169,00	1.296,23	1.523,59
8		Ngijo	33,60	257,71	136,28
9		Ampeldento	114,80	880,52	968,26
10		Banjararum	114,00	2.336,63	960,06
11	Singosari	Tunjungtirto	147,00	3.013,03	1.298,18
12		Langlang	101,00	2.070,17	826,86
13		Sekarpuro	72,00	556,93	529,73
14		Ampeldento	161,00	1.245,36	1.441,62
15	Pakis	Sumberkradenan	137,00	1.059,72	1.195,72
16		Kedungrejo	66,00	510,52	468,25
17		Mangliawan	133,00	1.028,78	1.154,74
18		Tirtomoyo	20,00	154,70	-3,06
19		Sitirejo	91,00	363,09	724,40
20	Wagir	Sidorehayu	112,00	446,88	939,57
21		Jedong	59,00	235,41	396,53
22		Pandanlandung	19,00	75,81	-13,31
23		Ngingit	90,50	913,54	719,28
24	Tumpang	Kidal	62,00	625,85	427,27
25		Kambingan	57,00	575,38	376,04
26		Tambaksari	122,00	925,05	1.042,03
27	Tajinan	Tangkilsari	150,30	1.139,63	1.331,99
28		Sumbersuko	125,00	947,79	1.072,77
29		Kebonagung	184,70	1.765,73	1.684,45
30	Pakisaji	Kendalpayak	192,10	1.836,47	1.760,27
Total			**2.900,40**	**26.808,17**	**23.478,01**

Result of regression model simulation indicted that rice production output for all villages was 23,478.01 tons with rice-land area of 2,900.40 Ha. Under this circumstance, rice-land productivity for all villages was 8,09 tons/ha. This productivity was quite high and potential if compared with other regions. Based on the result of regression model simulation, there were 11 villages with rice production output more than 1,000 tons/year. These villages in its existing condition would have quite extensive rice -land but it influenced urban effect when land conversion activity must be inescapable. The impact was evident on 12 other villages with rice production output less than 500 tons/year.

4. Conclusion

By taking account the result of regression model calculation, rice-land area was an influential variable for the supply of rice production output. In concern with their regional characteristic, villages that quite higher productivity, precisely 8.09 tons/ha and the rice was a consumable food by few community members. Achieving this productivity, it would need very big and potential rice-land supply to produce the expected rice production output.

However, there were 12 villages with rice production output less than 500 tons/year. It is then recommended that the direction of policy must consider regional characteristic. Villages with extensive rice-land must be able to maintain its rice-land and to improve the quality and productivity of its land. Farming activity should be the dominant work in the village, and the supply of rice production output must be made available for fulfilling the rice demand of the community.

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Characteristics Utilization of Public Space in Padang City Based on Good Public Space Index

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Abstract

Padang city with a population approaching one million leads to the development as a metropolitan city. Currently, the city of Padang has 40 units open space managed by the government or referred to as a public open space, with a total area of 20.88 hectares. This study was performed to assess the characteristics of public open space utilization, especially those located in the central business district of Padang, namely Imam Bonjol Park (representing the City of Green Open Space), H. Agus Salim Sports Centre (representing the Sports Park) and the Padang Beach Park (representing Recreation / tourism). The research method is done through several stages, the first being to identify the typology of function space (Carmona, 2008), and assess space utilization index based approach to Public Space Index (Mehta, 2007). The space quality is measured based on the variables in Good Public Space Index, the intensity of use, the intensity of social activity, duration of activity, variations in usage and diversity of use. Rate average index of the quality of public space in the city of Padang is of 0.69. The quality of public spaces in case some of the parks in the city of Padang has included into the index category of Moderate quality. This is presumably due to the lack of diversity in user activity time, less formation of social interaction between users, and the duration of the average time visitors who are still short in exploiting public space

Keywords: open public space; good public space index; utilization.

1. Introduction

One of the effects of population growth and the development activities in Padang is the reduction in public space for outdoor activities. Padang City has several public space are built and managed by the government, the open spaces it is public, but not all of them can be used by the public as a space activity, since most parks of the park passive, which is a park that is only to be planted with crops and not for activities.

Most of the open space located in the city of Padang is passive and limiting access to citizens in activities in open space. In general, there are only three (3) public space used by the public to indulge in open space, the Imam Bonjol Park, H. Agus Salim Sports Centre and recreation area Muara Padang Beach located in the downtown area.

The issue of the use of urban public space based on several studies that have been done in public spaces in the city of Bandung (Eriawan, 2003) explains that, as the varying characteristics of the park based on physical characteristics. Of the three basic characteristics that characterizes the park, which is a public park that is multi-functional, the memorial garden that is the image formation (visual and symbolic) and a monumental impression and passive recreation park.

In addition, their homogeneity, space utilization based on user preferences in activity, which is more likely to perform activities that are active, especially sports, although not available sports facilities in particular, but the shape of the courtyard that is in the form of pavement broad cause users considerable discretion in doing activities active. While the park does not provide facilities for active activities and the dominance of the surface with a grassy surface is less enthused by the user in the activity. The discrepancy utilization of the facilities available form, so that in addition to landscape design to be adapted to the principles of its design, should also consider the user desires in the activity.

The purpose of this study was to assess the shape of the space utilization of the existence of the city's public spaces in the city of Padang. The study used a sample at three public space that Imam Bonjol Park (representing the City of

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Green Open Space), H. Agus Salim Sports Centre (representing the Sports Park) and the Muara Padang Beach (representing Recreation / Tourism Park).

2. Methods

This study uses the characteristics of the user and activity (behavioral study). Data obtained from the observation of the behavior that appears on parts observations, With the help of behavioral techniques mapping (Hariyadi and Setiawan, 1995: 72-74).

Recording the proper data is needed to capture information that is very dynamic behavior. Some of the necessary equipment, among others: (a) digital camera, useful for recording a static picture of the situation of observation. The weakness of using this tool is not able to record the time (duration) of users carrying out an activity. (b) video camera, allows to record dynamic images where recording time (duration) of activity may also be done. (c) Global Positioning System (GPS) is a tool for measuring and recording the position of the object, which is used to record the position of space objects observed and included record objects in motion tracking. The results of this data is used to record the movement of the user and the user's position in space.

To facilitate the recording and compilation of data, observations segments need to be established first. The division of this segment to the purpose of research, especially related to the operation and interpretation, thus the observation segment can be considered as the unit of analysis.

Good Public Space Index (GPSI) is a method that describes how a public space for the community to use meaningful social activity as well as the characteristics of the outdoor space as an approach (Parlindungan 2013). GPSI variables and measurement method, comprising:

Intensity of use (IU), this variable is explained by the number of people engaged in activities in park, by dividing the average number of people with the greatest number of the average person who looks beyond. With formula:

$$\text{IU} = \frac{the\ average\ number\ of\ people}{largest\ number\ of\ people} \qquad (1)$$

Intensity of social use (ISU), this variable is explained by the existence of the group in park. The group occurs when there are at least two people involved in the same activity. This variable is measured by dividing the number of people involved in the group of the largest number of people involved in park. With formula:

$$\text{ISU} = \frac{the\ average\ number\ of\ people\ in\ the\ group}{the\ highest\ number} \qquad (2)$$

People's duration of stay (PDS), this variable is explained by the duration of the people to carry out activities in park. This variable is measured by dividing the average time used with the longest time used the space. With formula:

$$\text{PDS} = \frac{Average\ time}{the\ longest\ time} \qquad (3)$$

Temporal diversity of use, this variable is measured based on the distribution of activity that occurs in a period of observation. This variable was measured by using the method of Simpson's Diversity Index. Data from this assessment is the number of diversity of activities available at each observation period (morning, noon, evening and night).

Variety of use, this variable is measured from the variety of activities. This variable was measured by using the method of Simpson's Diversity Index. Data from this assessment is the number of diversity activities.

Diversity of users, this variable is measured from the diversity of the characteristics of the user. This variable was measured by using the method of Simpson's Diversity Index. Data from the assessment is the number of diversity characteristics of the user.

Simpson's Diversity Index Formula = 1 - D

$$D = \Sigma n(n-1)/N(N-1) \qquad (4)$$

3. Results

3.1 Typology of the City of Padang Public Space

Based on the results of data identification of the existence of public space in the city of Padang, it can be arranged typology based on multiple variables that are owned, it based on area, land surface type, type of activity, and more. Based on comparative analysis between the shape and characteristics of the existing public space with theoretical concepts as well as applicable legislation, the public space in the city of Padang can be grouped based on several variables, as described in the following table.

Table1. Type of Public Space in Padang based Assessment of Multiple Variables

Variable	Public Space Type		
	Imam Bonjol Park	Padang Beach Park	H. Agus Salim Sports Centre
Area Wide (Typology based on area wide)	2.5 hectares (city park)	10 hectares (region park)	5.5 hectares (region park)
Domination of Land Cover (Typology based on pavement)	Grass and plant (soft space)	Asphalt, paving block, sand (hard space)	Asphalt, paving block, grass and plant (hard space)
Activities	Recreation, sport, celebration	Recreation, sport, celebration	Recreation, sport, celebration
Accessibility	Easy to access	Easy to access	limited to a particular facility
Ownership	Public (local government)	Public (local government)	Public (local government)
Form space	Square	Linier/street	Square

Fig.1. Imam Bonjol Park (a) pavement type; (b) users activity; (c) park facility

Fig.2. Haji Agus Salim Sports Center (a) pavement type; (b) users activity; (c) park facility

Fig.3. Padang Beach Park (a) pavement type; (b) users activity; (c) park facility

3.2 Space Utilization Rate Index

Rate index of the quality of public spaces in the city of Padang conducted by assessing five (5) variable quality of the space, as described in section research methods. Observations and field measurements performed on a weekend (Sunday), where it is assumed on the day of the intensity of use of public space is higher than the other days. Observations were made for 4 (four) times in each public space, with observation time from morning till night. The data used is the average number of such observations. The following are observations and field measurements that have been done.

Table2. Conclusion of Public Space Index Padang City

Variable	Index of Variable		
	Imam Bonjol Park	Muaro Padang Beach	H. Agus Salim Sports Centre
Intensity of Use (IU)	0.497	0.589	0.485
Intensity of Social Use (ISU)	0.609	0.586	0.659
People's Duration of Stay (PDS)	0.656	0.625	0.563
Temporal Diversity of Use (TDU)	0.734	0.729	0.765
Variety of Use (VU)	0.818	0.773	0.808
Diversity of User (DU)	0.859	0.849	0.864
TOTAL GPSI	4.174	4.150	4.143
Average GPSI	0.696	0.692	0.690
Category	**Moderate**	**Moderate**	**Moderate**

4. Conclusion

Based on the research that has been carried out, the quality of public spaces in case of Padang have an average index of 0.69 means included in category Moderate quality. The quality of public space that has not reached the Good index, allegedly due to lack of diversity in user activity time, less formation of social interaction between users, and the duration of the average time visitors who are still short in exploiting public space. All public spaces in this case, did not show a significant difference in quality, where the value of the index on each is not far adrift and still be in the same range.

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Pedestrian Visual Recommendation in Kertanegara – Semeru Corridor In Malang City

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Abstract

Streerscape could be the first impression to see an urban area. One of the streerscape to be observed is the corridor Kertanegara – Semeru because on the corridor has strong character and the one of the main axis in Malang City. Beside that, many of pedestrians and another road user were through these streets. This research aims to know the visual quality and recommendations for corridor Kertanegara – Semeru based on visual pedestrian. The method used in this study was, Scenic Beauty Estimation (SBE) and use historical examination. There are several variables that are used including scale of space, flexibility of visual, beauty, balance and emphasis, dominant. Based on these variables made assessment by pedestrians as respondents. Based on the results of the SBE has done indicates that have a good of visual quality because there are 10 photos with low visual quality that was in the path of Semeru and 14 photos with High visual quality on the road Kertanegara, Tugu and Kahuripan. Then through historical research and reference from high visual quality, will be used to do recommendation of the landscape with low visual quality.

Keywords: Aesthetic; landscape; corridor; visual quality; historical

1. Introducing

Visual quality is one of the factors that can directly give satisfaction to the user or bystanders. Visual quality is difficult enough if objectively stated but can be measured through the response of humans. The visual quality of the landscape cannot be resized with the measurements, but rather can be as quality resulting from human perception, measurement must involve of human [2].

The development of Malang from time to time affect the visual quality that much change. The condition of visual quality is no exception occurred in Kertanegara until Semeru corridor also changing. On RTRW Malang, Kertanegara – Semeru corridor is potential to strengthen the character of Malang. It became the basis of the need to do the Setup on the road corridor.

Vision of the city of Malang, namely accomplishing the Malang as quality education, Healthy and environmentally friendly City, a city Tourism cultural, towards a developed Society and independent [5]. As for the cultural tourism within the point intended, namely within the Mission of realizing and developing cultural tourism as well as to maintain and develop the environment and buildings of cultural heritage for the benefit of history, science, culture and tourism. The plan specified the tourism region of which namely Gajayana Stadium, a public library and Archive of Malang, the area of monument square, train station. Kertanegara – Semeru corridor has set as a strategic area of social culture in the area of the circle around the monument, a large Street road corridor Semeru Ijen Gajayana Stadium and the complex. The existence of the arrangement along the way, especially on the basis of the perception of pedestrians as a subject who can better feel the visual of the corridor is expected to strengthen the visual character of Malang and support the existing plan as on RTRW Malang. The presence of buildings that have the character and values of its own history of being able to give the impression towards anyone who saw it, but the impression that in the impact is affected by whether or not good management and structuring elements of other elements that exist in the surroundings.

Visual quality assessment in an area affected by several elements of the landscape and elements which can affect a person's feelings while in the environment. Elements as well as elements that are meant, among others, scale, visual comfort include the spaciousness and beauty, unity that includes the balance and emphasis, and domination [3].

Visual content refers to the structures and spaces of an area that provides information for each individual in the form of perception that can be used as the development environment directives [6]. The structure of physical objects

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and human activities that make up environment and relationship of the elements in it are the main character to establish of a character [7].

Some problems that exist in the area of study that is :

1. The rapid developments that led to the change in the faces of the Malang City, especially in the main street as the Kertanegara-Semeru Corridor. It is capable of affecting the existence of visual degradation of the existing road corridor in Kertanegara-Semeru.
2. The identity of the city existing since the early development of Malang on Kertanegara -Semeru corridor cannot be captured entirely by pedestrians due to the increased activity that exists in the region and the development of corridors.
3. Some of the existing visual scenery spot in Kertanegara – Semeru corridor who hindered by other objects such as trees and advertising billboards so pedestrian visual comfort in eyeing unobstructed. It affects the visual quality of the corridor in Kertanegara – Semeru.

2. Methods

This research was conducted through the observation field, and filling of the questionnaire by people walking in the corridors of the road Keranegara – Semeru to get visual quality assessment in each Corridor according to the public perception. In this study the variables used among them are, the scale, circulation, beauty, balance and emphasis, dominant [3]. A variable scale referred to in this study is the distance between the buildings to the height of the existing building, while variable circulation and beauty is variable from the visual comfort, as well as with variable emphasis and balance which is a sub of variables from the unity. The next variable that is dominant (soft and hard elements element).

The method in this research is use Scenic Beauty Estimation (SBE) is quantitative is a system for indexing lasnkap aesthetic qualities. The purpose of the use of this method is to provide predictions are valid by using the perception of the observer. Aesthetic quality assessment scale interval in the form of scenic beauty that comes from the perception and assessment by human observers. Observers in the mean can represent the general public, or community chosen from certain populations [4].

Scenic Beauty Estimation by Daniel & Booster is an aesthetic estimation using SBE method that consists of three main steps, namely shooting lasekap, slide presentation and analysis of data. In this study, there was little change in phase to determine the value of SBE is as follows:

1. Determination of observation points or vantage point done before researchers conducted street shooting landscapes. Each region or area has a vantage point or more different [4].
2. Photographing landscapes based vantage point is done with the principle of human vision is based on the point of perspective, degrees, and distance.
3. Selection of photos. After the primary survey in the form of image capture by the observation point and then the photo image is selected by presenting it to the respondent. Respondents were selected in this research communities in the study area as a pedestrian.
4. Assessment by the respondent. Assessment by respondents was conducted by viewing the photos in the form of a slide for 8 seconds and is done randomly and then slide is immediately assessed by the respondents. The use of rating scales 1-10 to assess the quality of the landscape that is based on each of the variables used in this study, where 1 indicates very low ratings to the visual quality of the landscape and the rating scale 10 shows the visual quality of the landscape is very high. Assessment by respondents is only done once, not allowed reassessment [4].

Calculation of the number of respondents that were used in this study that is using time linear function. The following function of Time Linear Function:

$$N = \frac{(T\text{-}to)}{t1} \qquad (1)$$

n = the number of the selected samples
T = the number of the selected samples (10 day x 24 hours = 240 hours)
t0 = fixed long time survey (9 hours / day x 10 day = 90 hours)
t1 = the time of the survey were used for each sampling unit (0,25 hours x 10 day = 2,5 hours)

$$N = \frac{(T\text{-}to)}{t1} = \frac{(240\text{-}90)}{2{,}5} = \frac{150}{} = 60 \text{ Respondent}$$

Then for the dissemination of the questionnaire to each respondent used sampling method that is using accidental sampling.

The next phase, the calculation of the value of the SBE. The stage of the calculation of the value of the visual with the method of tabulating data beginning with SBE, calculation of the frequency of each score (f), perhitungan cumulative frequency (cf) and cumulative probabilities (cp). Further determined the value of z for each value of the cp. average z: Value obtained for each photo and then put in the formula of SBE. As for the SBE formula that is as follows:

$$SBEx = (Zx - Zo) \times 100 \qquad (2)$$

SBEx = the value of the landscape to the SBE x
Zx = average value of Z to the landscape x
Zo = the value of average z: a landscape standard (average value of z is most close to zero)

In addition to using analysis of SBE, this research also uses series vision [1]. This method has chosen aims to find out the changes in Kertanegara – Semeru street of the early development and current conditions.

Serial vision picture of visual images captured by a bystander who happened when walking from one place to another in a region. Records of the view by the observer into the picture gradually cut pieces and form an integral image recording area for observers.

The orientation to be one factor that is important in understanding a city. Characteristic of a city is the area of the region that can be seen or understood as a series of vision. It is necessary in this case is the observation process in motion. The process is called an advanced optical divided two groups, view current or existing view and a view that will appear or emerging view. Existing view has to focus on one area only, but the emerging view has focused on the link between the region and other regions [1].

3. Results

Visual quality assessment Kertanegara - Semeru corridor based on pedestrian landscape photos in each formula is calculated using the SBE. High visual quality (value of SBE high) showed that the landscape was selected as the most beautiful landscape, while the visual quality is low (low value SBE) describes the landscape of the ugly or not preferred (Table 1.)

The results obtained from the SBE in each photo, then divided based on three classes, namely low, medium and high compliance with the interval class (Table 2.) use simplified rating with following formulas:

$$I = \frac{\text{(The highest value – the lowest value)}}{\text{(The number of classes)}} \qquad (3)$$

$$= \frac{(108.013 - (-73.033))}{3}$$

$$= 60{,}348$$

Based on the grade obtained 10 photos with visual quality is low, 29 photos with visual quality medium and 2 photos with high visual quality. Visual quality is low is dominated from the road, while Semeru high visual quality is dominated on the Tugu road dan Kertanegara. Landscape with low visual quality of them is 1U 01, 1U 02, 2U 04, 3S 01, 3S 03, 3U 01, 3U 02, 3U 03, 3U 04, 3U 05. Overall out of 10 the photo has a beautiful visual low so as not to create the impression that appeals to walkers. In addition to the lack of the presence of vegetation gives rise to stiff impression in the corridor because of the dominance of hard elements more prominent. Variations in the use of vegetation also can cause monotonous or dull impression.

Overall, the lack of harmony between the elements that formed the landscape affect the visual quality. The existence of elements of soft and hard elements are supposed to be mutually supporting one another so as not to give rise to the impression of a too rigid or too shady in the corridor that is because of one of the elements that dominate. The existence of elements of the softly like a tree that blocks the visual of thehikers also affect visual quality on the corridor. Average vegetation in the path of pedestrians blocking the view from the promenade. In addition to the distance between the face of the building which is not the same it can be a problem that is obstruction of the view from the promenade.

Landscape with low visual quality will be given recommendations improvements based on landscape with high visual quality.

Landscape with high visual quality on Kertanegara-Semeru corridor 14 photos. High visual quality on the corridor dominated by photos that are on the road and in 1922, while the monument just a few that are on the path of Kahuripan and Semeru.

Table 1. Calculation Of The SBE

Picture 1U 01					Picture 1S 01					Picture 5S 06				
Skor	f	cf	cp	z	Skor	f	cf	cp	z	Skor	f	cf	cp	z
1	0	12	1	-	1	0	12	1	-	1	0	12	1	-
2	0	12	1	2.326	2	0	12	1	2.326	2	0	12	1	2.326
3	2	12	1	2.326	3	1	12	1	2.326	3	1	12	1	2.326
4	2	10	0.833	0.967	4	1	11	0.917	1.383	4	0	11	0.917	1.383
5	1	8	0.667	0.431	5	2	10	0.833	0.967	5	1	11	0.917	1.383
6	5	7	0.583	0.210	6	4	8	0.667	0.431	6	2	10	0.833	0.967
7	2	2	0.167	-0.967	7	4	4	0.333	-0.431	7	4	8	0.667	0.431
8	0	0	0.000	-2.326	8	0	0	0.000	-2.326	8	3	4	0.333	-0.431
9	0	0	0.000	-2.326	9	0	0	0.000	-2.326	9	1	1	0.083	-1.383
10	0	0	0.000	-2.326	10	0	0	0.000	-2.326	10	0	0	0.000	-2.326
The total number of Z				-1.685	The total number of Z				0.024	The total number of Z				4.677
Z average				-0.187	Z average				0.003	Z average				0.520
SBE = (-0,187 – 0,003) x 100 = -18,992					SBE = (0,003– 0,003) x 100 = 0,00					SBE = (0,520– 0,003) x 100 = 51,697				

Tabel 2. Interval Class

Category	Value of SBE
Low	-73.033 - (-12.685)
Medium	-12.684 - 47.664
High	47.665 – 108.013

After obtained visual quality of each picture, then conducted a descriptive analysis in related areas of study conditions in the past to each from. The results of the analysis of the quality of the produce visual differences and similarities of conditions of the past with the present.

After the analysis is performed for each picture, then do the Setup recommendation corridor. Picture with high visual quality has several elements that support so that the picture belongs in the class of visual height, while the picture with low visual quality has several factors rated poorly by pedestrians. The next step that is done the Setup recommendation on picture quality with low visual.

The recommendations given in the picture with a low visual quality refers to the picture with high visual quality by considering the similarity of the picture owned and the appropriate variables to be applied on a picture with the visual quality is low. In addition recommendations do refers to the condition of the differences and similarities between the past and present as well as referring to the picture with high quality pedestrian based. (Picture 1)

4. Conclusion

Kertanegara – Semeru Corridor consists of several corridors including Semeru road, Kahuripan road, Tugu road dan Kertanegara road. Overall Kertanegara – Semeru corridor have a good visual quality because there are 14 and 29 of 53 picture picture quality with high visual landscape and visual quality are.

The results of the grouping based on the value of the SBE in each picture produces picture with high visual quality is a picture with a value of SBE 47,665 – 108,013, and the picture with a visual picture is being kualtas with the value of SBE. -12,684-47,664 and picture quality with low visual is a picture that has a value of SBE 47,665 – 108,013. Picture with high visual quality that is the picture that has the dominance of vegetation, have a keharmoniasan between elements of software and hardware elements, have a point of interest, have a good visual comfort, and has the distance between the buildings to the height of the building. It underlies the recommendation made to the picture with a visual quality is low. While the existing conditions in the area of study that is the number of objects that obstruct the pedestrian visually like trees and advertising billboards with a large size. Besides the hard elements more dominating than the soft elements, it gives rise to the impression of a rigid corridor and uncomfortable. Setup

recommendations obtained from results of overlay between the perception of pedestrians with historical conditions in the Kertanegara – Semeru corridors. In addition to this recommendation which is done also refers to the picture with high quality. Some recommendations to improve the visual quality is done in the form of the addition of the vegetation. Based on the reference to the picture with high quality, recommendations are carried out in the form of the addition of software elements on a landscape still dominated by harsh elements.

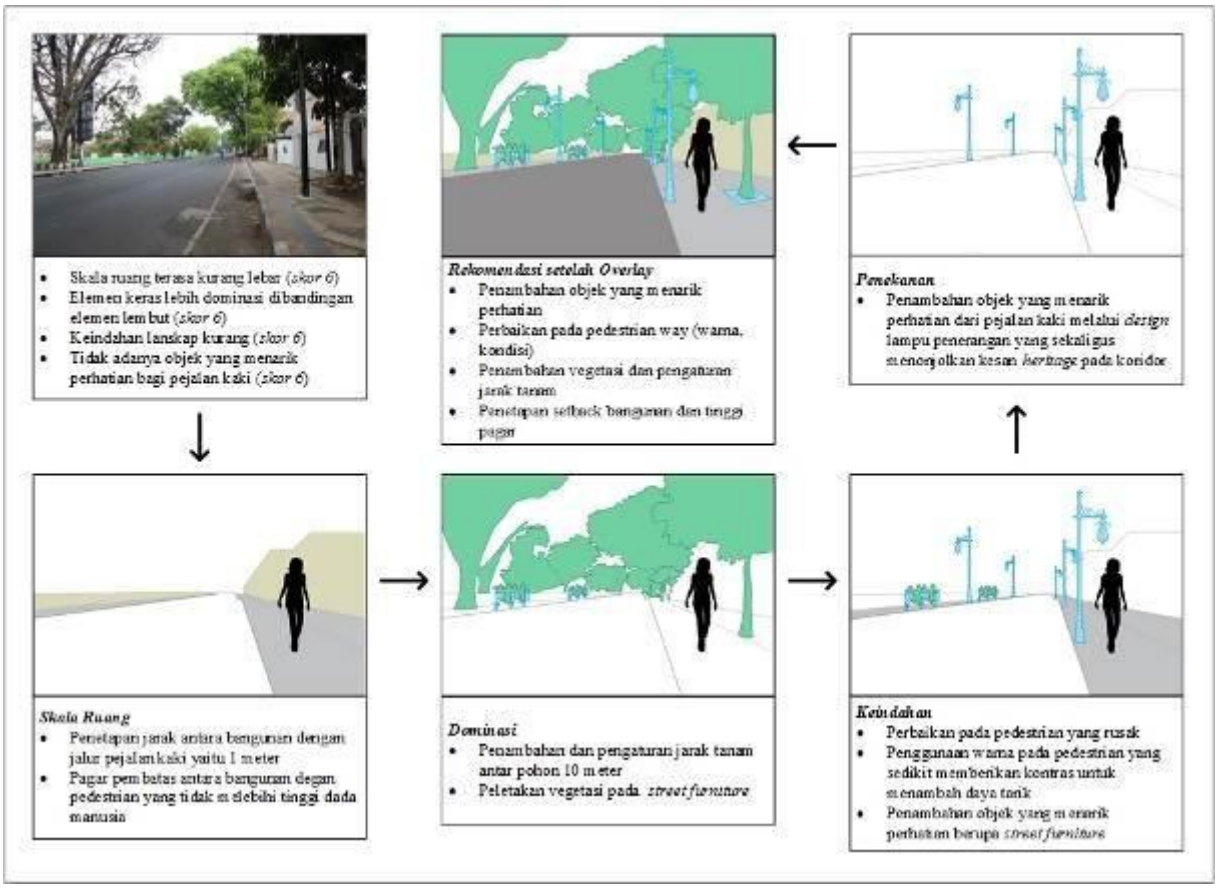

Fig. 1. Examples Of Recommendations Kertanegara - Semeru Corridor

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Part 2

Regional Planning and Public Policy

The 3rd International Conference Planning in the Era of Uncertainty:
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Planning of Dairy Farm and Dairy Plant Based Ecotourism

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Abstract

One of a dairy production company produce pasteurized milk and yoghurt drink, which brand has widely known in East Java, in a factory plant in Batu City. Batu City is one of tourism destination in Indonesia because of various tourism attractions located here. Behind the factory plant, there is a vacant land with an estimated total area of 2.3 ha and a vacant cowshed which has not used for cattle ranching. Because of that, the company plans to develop the land behind the plant as a dairy farm & plant based eco-tourism. In addition, dairy farm and dairy plant based tourism attractions are still rarely found in Batu. Thus, the first aim of this study is to analyze potencies of the company that relate to future plans to be built as ecotourism and set up the strategies that can be done in order to actualize the ecotoursim project. The next aim is to plan the ecotourism, especially the facilities planning and the facilities arrangement plan when its built on the vacant land. Strategic management approach is used to analyze potencies and determine the strategies. To select the proper facilities, tourists were asked to give appraisal by using close ended questionnaire. Appraisal result was mapped onto four quadrants spatial map to see advantages and shortcomings of each facility along with choosing the right facilities to be built. Those facilities and tourist activities were compared with ecotourism criteria to make sure that the facilities are appropriate to provide not only entertainment but also ecotourism function. To arrange the chosen facilities, the step in Systematic Layout Planning were conducted to generate a propose layout of facilities arrangement. Based on potencies analysis, in Internal-External matrix, the company current position was on quadrant 2 (grow and build), with the most appropriate strategy is intensive or integrative. One of the strategies is to bulit the new infrastructure and renovate cowshed and adding new tourism facilities on the land. There were 11 facilities selected based on MDS. Moreover, based on SLP, a facility layout has designed and proposed to be built on the vacant land behind the factory as the new ecotourism destination.

Keywords: dairy farm; dairy plant; ecotourism; facilities layout planning; multidimensional scaling; strategic management; systematic layout planning

1. Introductıon

According to Damanik & Webber[1], tourism is a recreational activity outside the residence to get away from routine activities or look for other atmosphere. One kind of tourist attraction is natural resource that should always be preserved along with tourism attraction development. Traveler's awareness to preserve the nature is needed while traveling. Raising traveler's awareness can be done through provision of ecotourism. One of tourism destination in Indonesia is Batu City. There are some featured products from this city, including pasteurized milk. One of dairy production company has a vacant land behind the factory. In addition, dairy farm and dairy plant based tourism attractions are still rarely found in Batu. Because of that, the company plans to develop the land behind the factory as a dairy farm and dairy plant based ecotourism destination. Therefore, the company needs to know its internal strength and weaknesses, along with its external opportunities and threat to analyze the potencies and also determine the strategies that can be done in order to actualize the ecotourism project.

Strategic management approach is used to generate the appropriate strategies. According to David[2], Strategic management is the science concerning in formulation, implementation and evaluation of cross-functional decisions that enable the organization to achieve its objectives. There are several tools that can be used including SWOT matrix, Internal Factors Evaluation (IFE) Matrix, External Factor Evaluation (EFE) Matrix, & IE Matrix. All those tools would be used to analyze the company's potencies and to generate the appropriate strategies.

After determining the strategies, the next step was to make the development plan, especially for the ecotourism facilities. Traveler's requirement should be considered. To determine the type of ecotourism facilities, identifying and analyzing the needs of travelers are necessary to be done. One of method used is Multidimensional Scaling (MDS). According to Masuku, et al[3], MDS is a method of analysis related to the placement of objects on a multidimensional map which is determined based on the similarity obtained from the respondents' perception based on attributes. Therefore, this method is used to determine the appropriate type of facility to be built or developed in milk processing

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plant as ecotourism based on traveler assesment. Subsequently, the facilities then organized by applicating one of industrial engineering science that is facilities layout planning. In Wignjoesoebroto[4], facility layout planning is a way to organize factory facilities to create the most economical, safest, and most comfortable working areas, therefore it can raise morale and performance of operators. One method of designing facility layout is Systematic Layout Planning (SLP). SLP is used because of systematic approach to design the layout. In designing facility layout, the closeness relationship among facilities will be determined and considerated by using Activity Relationship Chart (ARC). ARC is also more suitable to determine the facility layout because the objects processed in ecotourism facility is the people whose number is uncertain, unlike the production floor that uses the exact amount of material flow as consideration.

2. Methods

As explained before, the potencies analysis was done by several tools. Firstly, internal & external factors of the company that can be considered for ecotourism development. SWOT matrix was used to determine a strategy based on internal & external factors. IFE & EFE Matrix were used for weighting internal & external factors. IE Matrix was used to determine the type of strategies appropriate to the company position.

In determining facilities, management is asked to determine their requirement of facilities. Also, existing facilities in competitor tourism attraction are identified. The results of those stages were used as ilustration to help respondents in filling questionnaire to identify tourist's need. Facilities resulted from previous questionnaire then appraised by respondent perception based on several criterias using close ended quetionnaire. Appraisal result mapped onto four quadrant map using MDS to see the advantages and shortcomings of each facilities along with choosing the right facilities to be built. Furthermore, the identification and determination of activities and equipments in each selected facilities were done. Those facilities and tourists activities then compared with ecotourism criterias to make sure that the facilities were appropriate to provide not only entertainment but also ecotourism function

Systematic Layout Planning (SLP) is used to design facilities layout in a systematic way. Firstly, space requirement is determined based on activities & equipments. Several standards from literatures also used to determine space rquirement, such as standard from Littlefield[5] and Neufert[6]. Then, closeness relationships among facilities were determined using Activity Relationship Chart (ARC), subsequently illustrated in Space Relationship Diagram (SRD). Modifying consideration and practical limitations then determined to help in designing layouts. Hence, the layouts will be designed according to actual condition in the vacant land. Space requirement, ARC, SRD, modifying consideration, and practical limitations were used as reference in making proposed layouts.

3. Results

Internal and external factors of the company can be seen on Table 1. Based on weighting score calculation of internal and external factors, 3,53 was obtained as a total weigted score for internal factors and 2,94 as a total weighted score for external factors. The value mapped onto IE matrix and resulting the position of the company, which is lied on quadrant II. That means the type grow and build strategy was appropriate to be held by the company. The strategies such as opening more outlet in famous tourism object, promote the ecotourism in the outlets, intensive promotion, participated in infrastructure improvement, make a detail about ecotourism development future plan, renovate the cowsheds and vacant land by adding and arrange more tourism facilities

Table 1. Internal and External Factors of The Company

Internal Factors	
Strengths (S)	Weaknesses (W)
1. Pasteurized milk and yoghurt drink products dominate the East Java market. 2. Milk can be processed into other kinds of products such as ic cream and cheese. Those process can be another attraction for tourists. 3. Milk that produced is healthier because of containing high antioxidant, hence can be categorized as another atraction in educative and health way. 4. Some process might be exposed to the tourists, not only milk and yoghurt production process, but also waste treatment into compost or biogas. 5. A 2,3 ha vacant land behind the plant as the space for ecotourism development. 6. Plant strategic location, which is located in the main road of Batu. 7. Assured product quality because of higienic production standard	1. Production process has not allowed to be seen by tourist or public yet. 2. Promotion thorugh social media has not been done intensively. 3. Need substansial capital financial 4. Lack of adequate infrastructure..
External factors	
Opportunities (O)	Threats (T)
1. Developing products is planned to be penetrate to entire region of Indonesia because of its well known in East Java. Hence, the name of the company will also be known by more people. 2. Cooperation with big franchise companies that has widely known all over Indonesia, thus the cooperation can be continued for ecotourism development.	1. Many famous tourism object in Batu and Malang 2. Dairy products that quickly expired 3. ASEAN Economic Comunnity allows the company to has

3. Dairy farm and dairy plant tourism object is still rarely found in Batu. 4. Beautiful scenery of Batu.	competitors from other countries in ASEAN.

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As the continuation of the strategies, the determination of facilities was needed. To determine the facilities, perception datas were obtained from enclose questionairre. The datas were the result of appraisal done by tourist based on some principal of tourism attraction, such as availability of tourism activities that can be done (something to do), availability of landscape or attraction or information that can be obtained (something to see), availability of store, restaurant, or ability of tourist to allocate their fund to get the entertainment from the attractions (something to buy). Appraisal also considerate ecotourism principal, such as education, traveler's awareness to preserve the ecologies along with tourism activities, and economic advantages that local communities can get from ecotourism.

Appraisal result would be mapped onto MDS spatial map. Mean of each object in each variable were calculated and used as the input to calculate euclidean distance matrix. Euclidean distance matrix needs to be transformed into cross product matrix in order to obtain positive semi definite matrix to generate eigenvalue and eigenvector. Before it transformed to cross product matrix, the centering matrix needs to obtained first in order to determine the center gravity of coordinate, respectively with the cross product matrix. Eigenvalue and eigenvector were then generated, and coordinate configuraton of each object is also calculated. Mapping result of each object can be seen in Fig. 1.

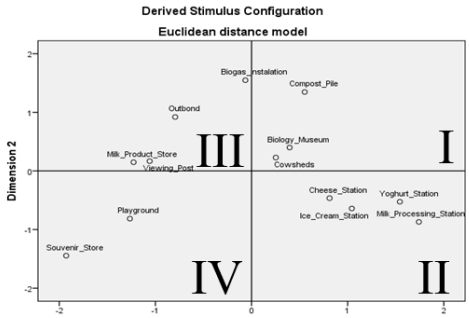

Fig. 1. Coordinate of Each Object on MDS Spatial Map

From Fig.1, it is known that cowshed, biology museum, and compost pile were coordinated on Quadrant I. It implies those three facilities were having advantages in all six variables. Meanwhile, biogas installation, milk product store, outbound, and viewing post were coordinated on Quadrant II, which implies those 4 facilities were having advantages in education, ecology preservation, and local community economy variable but having shortcomings in something to do, something to see, and something to buy variable because the negative value of the Dimension 1. Facilities coordinated in quadrant III were having all shortcomings in all six variable because of all negative values in both dimensions. Hence, it is decided not to select facilities in quadrant III.

After selecting facilities, activities and equipment then determined. Space requirement calculation were resulting 1,046 ha, including all complementary facilities, such as toilet, parking area, foodcourt, etc. Afterwards, closeness relationships among facilities were determined using ARC based on 5 types of relationship, i.e Absolutely necessary (A), Especially important (E), Important and core (I), Ordinary (O), Unimportant (U), and Undesirable (X). ARC resulting 3 A relationships ,8 E relationships, 32 I relationships, 48 O relationships, 71 U relationships, and 63 X relationships. The relationships & space requirements block then illustrated into SRD. The layout can be seen in Fig 2. By modifying consideration and practical limitations, there is a designed layout which will be proposed to be built. The advantages of the layout are foodcourt that directly accessible to travelers when passing the entrance, milk processing area that arranged circulary with the orchard as its center which made the scenery look more beautiful and the tourists can also immediately see all areas of milk processing, and boundaries between types of vehicles in the parking area easy to determined. Beside the advantages, there are some shortcomings of this layout, which are not so many alternative route can be pass, the location of outbound area is on the edge and likely to be felt sealed because it is directly adjacent to the border wall, and the south edge of outbound area is close to the parking area, hence the activities may disturbed by the vehicle sounds and polutions or activities outside of ecotourism because the outbound area better be directly connected with the pristine nature.

4. Conclusıons

The appropriate type strategy based on the company's position on IE matrix is intensive or integrative strategy, such as make a detail about ecotourism development future plan and also renovate the cowsheds & vacant land by adding and arrange more tourism facilities. Based on MDS, the apropriate facilities that selected were cowshed, biogas instalation, compost pile, outbound area, ice cream making station, yoghurt making station, cheese making station, milk processing station, viewing post, dairy products store, and biology museum. The arrangement of those facilities were designed into a layout. The advantages of the layout are foodcourt that directly accessible to travelers when passing the entrance, milk processing area that arranged circulary with the orchard as its center which made the scenery look more beautiful, and boundaries between types of vehicles in the parking area easy to determined. The shortcomings of this layout are not so many alternative route can be pass, the location of outbound area is on the edge and likely to be felt sealed because it is directly adjacent to the border wall, and the south edge of outbound area is close to the parking area, hence the activities may disturbed by the vehicle sounds and polutions from the outside of ecotourism.

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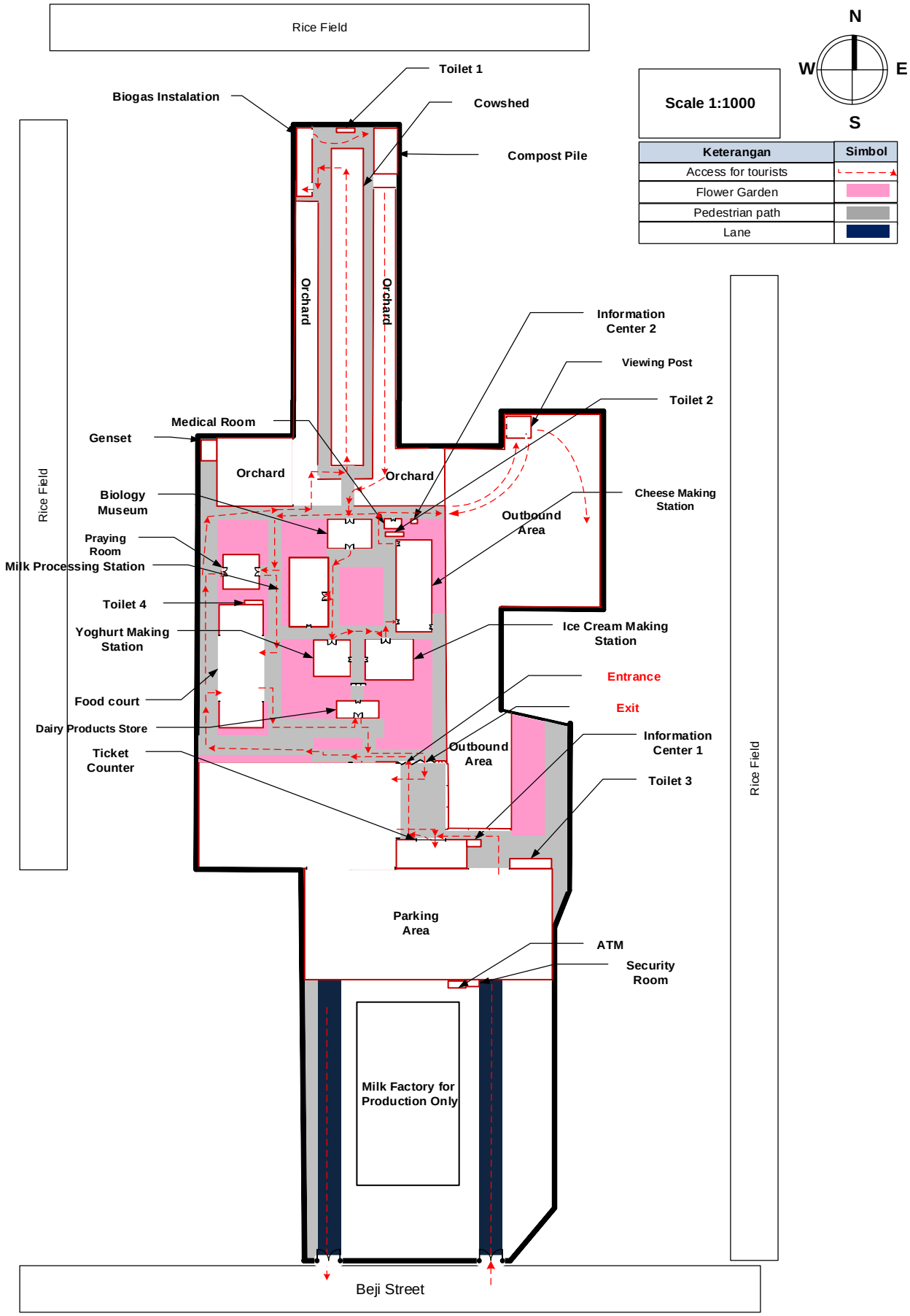

Fig 2. Layout plan of Dairy Farm and Dairy Plant based ecotourism

The 3rd International Conference Planning in the Era of Uncertainty:
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Measuring the Community Satisfaction Index of Population and Civil Registration in Malang Municipal

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Abstract

The demands and needs of public services' quality increased required by citizen, so that the Government of Malang as organizers and executors of public services must meet these demands. The Municipal Government in its efforts to improve public service performance, forming the regional One Stop Operator (PPTSP) with the goal will be to simplify and improve efficiency in administrative proceedings. But the existence of the one stop service is still not optimal because of the persistence of public complaints about the performance of the one stop service. This study will discuss the performance of services in service counter of Population and Civil Registration through community satisfaction index to measure the service level and the perception of satisfaction and interest to determine which variables are less optimal and need to be improved using IPA method. The results showed that the level of service at the service counter of Population and Civil Registration quite good. Meanwhile, according the results of IPA analysis, there are two important variables for the community on the performance / quality was lacking, namely the service procedure and time.

Keywords: satisfaction index community; public service;IPA

1. Introduction

The demands and needs of public services in Malang increased so that the Municipal of Malang as organizers and executors of public services must accommodate it. According the Law on Public Service No. 25 year 2009 and Regulation of the Minister of Administrative Reform No. 16 year 2014 about the Implementation of Public Service, the organization of public services must involve the community from the preparation of service standards, evaluation and award, as well as an active role in arranging public service's policy.

Malang City Government in its efforts to improve public service performance constructed one stop service located in integrated office block one of them is Population and Civil Registration Office. The existence of one stop service was expected to serve society throughout the administration of population and civil registration in one location. On the contrary, the existence of one stop service is not optimal due there are many complaints of citizens in Malang Municipal website against the public service, such as long service time and costs that are not in harmony with regulation [1].

In previous research, such as Frederik (2008) entitled Analysis of Public Satisfaction Index of the Public Service Health Center Ngersep Semarang, showed the quality of public service increase significantly after doing a survey of community satisfaction index [2]. As on Agustina research the Public Satisfaction Index Service Unit of Government Agencies in Tulungagung District Office, said that to improve the quality of public services required a survey or study on community satisfaction index [3], since government agencies are institutions that serve the needs of society. Therefore, the quality of services and satisfaction of the people should be main focus in government agency's performance. Thus, to fix the public service performance, there should be a study of public perceptions of agency performance. To measure the level of public services by calculating community satisfaction index and continued with IPA method to determine which variables are less optimal and needs to be developed.

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2. Methods

The variables used in this research to assess the performance of public services based on the Minister of Administrative Reform No. 16 year 2014 on Guidelines Survey Satisfaction Index Societies Operation of Public Services, are requirements, procedures, time of service, fees / tariffs, product specification services, officers competence, officers behaviour, edicts services, as well as handling, complaints, suggestions and feedback.

The sampling technique used simple random sampling, because respondents who selected are represent of a population [4][5]. The basis to determine the number of samples is from the population who is receiving the service counter on Civil Registration Office with an estimated error of 10% [4]. To determine samples used Slovin formula, hence obtained 100 people as samples.

3. Public Service Characteristics

Analysis of the characteristics of public service describes the performance's condition in Population and Civil Registration office elaborated on each variables of public service.

3.1. Requirements

In general, public service requirements on service counter of Population and Civil Registration has been suitable as the type of service. This fact also supported by the results of primary survey shows that 72% of respondents assess the requirements in accordance with the type of service. Although respondents felt that the requirement is very accordance with the type of service as much as 28%.

3.2. Procedures

Based on a primary survey respondents' opinions about the public service counters of Population and Civil Registration procedures consists of four votes, as many as 73% respondents rate the service procedure is easy, 7% rate it is very easy, 19% assess less easy and 1% judging difficult. The respondent' opinion who rate the service procedure is less easy and difficult due to the complicated procedure of having to adjust to the type of service counter and have to move to another counters.

3.3. Time Services

Based on a primary survey have known the time service in public service counters of Population and Civil Registration judged not fast by 11% respondents, less fast 38% respondents, 50% respondents said fast while very fast as much as 1% respondents. The existence of respondents who considered a public service counters is not fast enough and not easily influenced by the length of time waiting queue registration and the number of people who take care of administrative purposes, although the number of counters provided quite a lot and the counters are able to handle multiple types of services, but it is still deemed less.

3.4. Fees

The fees charged for getting public services on the of Population and Civil Registration considered reasonable by 60% respondents. While respondents were offered free charge approximately 60%. The fees charged generally to reimburse the cost of printing the ID card and certificate of civil registration. Respondents who do not charged fees such as to arrange KK update or data information or take care of other administrative services without having to print products.

3.5. Product Satisfactions Services

Product service specification is the result of a public service of Population and Civil Registration. Based on the survey results in mind as much as 88% respondents considered that the product specification of the service was accordance with the provisions. As many as 10% respondents rate the product specifications of the service is very accordance with the terms and 2% of respondents rate the product specification is less pursuant. Some respondents believed their product specifications are less suitable for general service due errors in the information / product type on the service.

3.6. Officers Competence

Officers competence includes knowledge, skills, expertise and experience of executive officers. Respondents assess officers competence consists of three votes, are less competent as much as 2%, 79% competent and very competent as much as 16%. Certain respondents believed their competence are less competent due there are some new officer that are considered not quite experienced and less readily in providing services so that the service time is not fast enough.

3.7. Officers Behaviour

Executing of officers behavior can be evaluated from politeness and friendliness of service personnel in providing services to service users. Based on the survey results, 5% respondents believe that the behavior of officers are less polite and friendly, though 84% respondents found the officers behaviour is courteous and friendly, and 11% respondents said very polite and friendly.

3.8. Edict Services

The respondents opinions about the service at service counter of Population and Civil Registration divided in 3 judges, are respondents who assess responsible as many as 87%, very responsible are 11%. Whereas respondents rate the service less liable services as much as 2%. Respondents who are consider less responsible for the counters officers who are joked with colleagues while serving the citizens.

3.9. Complaints, Suggestions and Feedback

Handling complaints, suggestions and feedback on the service counter is considered to have followed up properly by 82% of respondents, and followed up with a very good assessment by 10% respondents. On the other hand, 8% of respondents found the handling of complaints, suggestions and feedback are actionable but less well.

4. Community Satisfaction Index

Based on the calculation, the value of community satisfaction index toward public service counters of Population and Civil Registration is 75.83, meaning that it has a good level of public services. Generally all variables public service has a good value, but there are some variables that need to improve their performance, namely the service procedure and service time. Service procedures are still considered complex and convoluted, such as many types of counters available were confuse the public. In addition, in taking care of population administration, sometimes not only in the same counters, but had to move to another booth. It is considered less effective and efficient. Time service variable has the lowest average value among other services, because the queue waiting time is relative long and the number of people who take care of administrative tasks were so many. In addition, the malfunction of the queue number machine, so that people who take care of each become disorderly.

5. IPA Methods

To determine which service variables are still less optimal and needs to be developed used IPA (Importance Performance Analysis). The survey showed that the results of the public perception of the service counter of Population and Civil Registration Office. Variables that are considered good are requirements, fees / tariffs, product specification services, executive competence, executive behavior, edicts services, as well as the handling of complaints, suggestions, and feedback. On the contrary, variables that assessed need to improve are service procedures and time services.

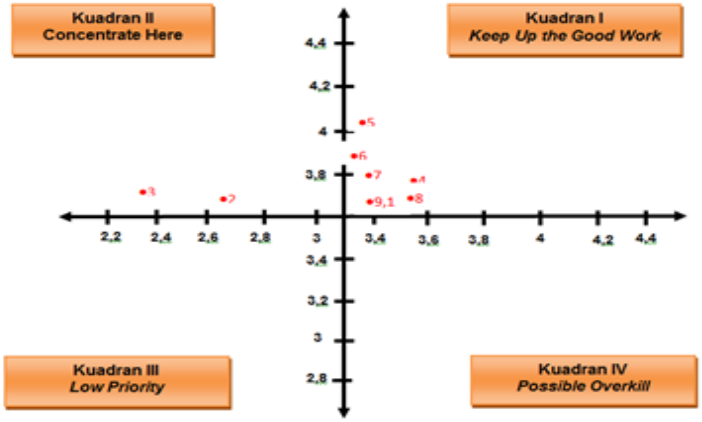

Fig. 2. Quadr**a**nt IPA of Services Counters of Population and Civil Registration in Municipal of Malang

Based on calculations using the technique IPA perception, public perception of the known results of the service counters' performance of Population and Civil Registration in Municipal Malang.

- Quadrant I, (keep up the good work / maintain performance)

The quadrant that includes factors that are important to service users and the level of perceived performance has been good. The variables that include this quadrant should be maintained, among other requirements, costs, product specification services, officer competence, officer behavior, edicts services, as well as the handling of complaints, suggestions, and feedback. Variables that are in Quadrant I assessed compliance as existing condition, in which the variables do not get many complaints from respondents.

- Quadrant II, (concentrate here / enhance performance)

The quadrants that load important factors to service users but the level of performance were considered unfavorable. The variables that in quadrant II must be improved among other variable, were service procedure and time service. Local people have complained about service procedures, related with the number of counters available and must be moved to other counters to taking care of the administration of population and civil registration. There was also complaint from citizens about time service. Citizens assessed that there was a long queue happened to take care the administration. The main problem is the number of people who manage the administration was so many. In addition, the malfunction of the queue numbers machine makes the atmosphere less orderly.

6. Conclusion

Based on the analysis of community satisfaction index and IPA method can be concluded that the public service at the service counter of Population and Civil Registration quite good. It is shown from the value of the satisfaction index and IPA method that seven services variables are in first quadrant. Those are requirements, costs, product specification services, officer competence, officer behaviour, edicts services, as well as the handling of complaints, suggestions, and feedback. Meanwhile, two other variables, namely the service procedure and time are in quadrant IV, where the two variables is an important variable for public service users counters but the performance is not good. Lack of good values of both variables due to (1) counters diverse confuse the general public and should be moved to other booth to take care of administration, population and civil registration, and (2) the waiting time is relatively long because of the large number of people with the paperwork necessary and queues less orderly because the malfunction of the machine queue number.

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The 3rd International Conference Planning in the Era of Uncertainty:
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Creative Industry in Supporting Economy Growth in Indonesia: Perspective of Regional Innovation System

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Abstract

Creative Industry is one of the most influential economy sources in the world in era 2000 years. It was introduced by John Howkins. He stated economy growth depends on new ideas. This concept also answers about industrial-based economy. Economy pillar has shifted from industrial economy (manufacture) to creative economy (intellectual as main asset). As developing countries, Government of Indonesia has seriously paid attention on creative industry sectors since 2009 through President Instruction Number 6 Year 2009 about Development of Creative Economy in Indonesia. Since Joko widodo has been President of Republic of Indonesia, creative economy is more developed by forming creative economy agency (Bekraf). Now, economy creative is one of new economy source that is promoted by Government of Indonesia. Many creative sectors are pushed to complete national economy in Indonesia. In this term, perspective of regional innovation system is also important to understand what is creative industry expected by Government of Indonesia. Innovation and creative economy is two terms which is not separated each other. This paper uses case study in Indonesia as research methodology, also perspective of regional system is to be main perspective in this study. The result is that creative industry and innovation are mutual relation each other in conceptual level. Practically, both are aimed to support economy growth and development in Indonesia.

Keywords: Type your keywords here, separated by semicolons ;

1. Introduction

Creative becomes "buzz word" in this decade, even since John Howkins launched the first book of "How People Makes Money from The Ideas" in 2001, creative word is debated by many scholars and practitioners at economy field. Creative term is one of new approachs to develop economy sector in developed countries. It is noted that creative economy is enough different to industrial economy sector. Notably, creative economy is boosted thorugh idea (intagible asset) as main capital, whereas industrial economy is boosted from tangible asset (Creative Economy Strategy for The District of Columbia, 2012). Howkins[3] says that "creativity simply as having a new idea and the creative economy as an economy where ideas, not land or capital, are the most important input and output.

Creative economy concept has emerged as means of focusing attention on the role of creativity as a force in contemporary economic life, stating that economic and cultural development are not separate but can be a part of a larger process of development (The Canadian Policy Research Group, 2013). Now, an increasing number of states are recognizing a creative sector approach as a useful and timely part of the solution to a changing economy [4]. In first time, creative economy has begun to do as leading component of economic growth, employment, trade, innovation, and social cohesion in most advanced countries. Now, this concept can be applied in developing countries if they implement effective public policy in place offering new economy source opportunities to leapfrog into emerging high-growth areas of world economy [1].

In concept of perspective of regional innovation system, creative industry is also depended on readiness of region to receive and to open access of new economy source. It is also reviewed from national and local policy in bringing new economy programs to improve income for both inhabitants and government. Creative and innovative strategies are similar in growing new economy in a particular region. In this term, Government of Indonesia supports two concepts as the recent way in developing economy growth at national level.

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2. Methods

This research uses two methods namely direct observation in field and review literature. Those methods is linear to how data were collected to complete this study. Direct observation is a data collection which derived from interview and data collection in field. Literature review provide is data which were derived comparison study, books, scientific journals and articles, acts, and supporting documents. This research was conducted along 2016 year in several regions in Indonesia.

3. Results

As a developing country, Government of Indonesia has seriously paid attention on creative industry sectors since 2009 through President Instruction Number 6 Year 2009 about Development of Creative Economy in Indonesia. In era of President - Susilo Bambang Yudhoyono in 2011, Government of Indonesia added function of Ministry of Tourism to be Ministry of Tourism and Creative Economy[26]. In 2013, Indonesian Statistic Board [5] noted that creative economy growth has achieved 5,76% of overall national economy growth by 5,74%. In addition, economy creative has contributed to gross domestic product (GDP) by 7% ($US 46,930 billion) and employed around 11,8 million people to work in this sector.

In 2015, creative economy focused on forming Creative Economy Agency (Bekraf)[27] when Joko Widodo leads Indonesia replacing Susilo Bambang Yudhoyono. Role of Bekraf is pivotal to develop and encourage creative entrepreneurs and its industries in Indonesia. Even, Bekraf is expected to leverage national economy growth based on creative economy income. Now, Bekraf has six main sectors of creative economy namely: 1) movie; 2) animation and design; 3) music; 4) craft; 5) culinary, and 6) fashion. Three sectors: culinary, fashion, and craft are highest contributors to GDP.

Practically in Indonesia, creative sector is close to innovation sector by which both support national economy in the different way. Although, both provide new strategy to increase people income, to widen job opportunity, to open access, and to increase added value. In the end, creative economy and innovation in particular region aimed to increase human well-being, not only to satisfy interest for academic field merely. Surely, regional innovation system inevitably tied to colour creative economy sector initiated by local people and local government.

At implementation stage, creative economy faces many challenges, which are from internal and external factors. Internal factors are like lack of capable human resource as creative actors and internal bureaucracy system/management. While external factors are regulations, market, social problems, and political support. Those factors are to be homework in each of local government in Indonesia, included for central government. This implies local people and Government of Indonesia proactively in supporting creative economy in Indonesia concurrent with implementation of innovation programs in many regions.

4. Conclusion

Creative economy has begun to do as leading component of economic growth, employment, trade, innovation, and social cohesion in most advanced countries. Now, this concept can be applied in developing countries if they implement effective public policy in place offering new economy source opportunities to leapfrog into emerging high-growth areas of world economy. In practice, creative economy and innovation are absolutely tied to improve people income through new economy strategy. In Indonesia, many local governments initiate economy creative which it is supported by innovative ways. Regional innovation system is one of strengths to run creative economy as sustainable program recently.

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[27] Bekraf is new economy agency in Indonesia. It is formed when Joko Widodo is President of Indonesia (2014-2019 year period). Recently, Bekraf deals with creative economy replacing Mministry of Tourism and Creative Economy formed in 2011. Now, Ministry of Tourism is specific in dealing with tourism affairs in Indonesia.

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The Integration of Disaster Risk Analysis into Spatial Planning In Indonesia: A Review from Indonesia Practice

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Abstract

Indonesia Law No. 26 Year 2007 concerning Spatial Plan has mandated to integrate the mitigation into Indonesia spatial planning. Currently, the integration of mitigation aspects in the spatial plan is in the form of superimposes the hazard map (*rawan bencana*) into other thematic map to be analyzed as the environment support into the land use. The term of disaster map that is used in spatial plan development refers to the hazard map. Hazard map is a manifestation of hazard analysis, which is part of risk analysis. Have the practice implemented in integrating the disaster map into the spatial plan nowadays been appropriate? Is it enough by using only hazard map in spatial plan in Indonesia? How about risk map? Where these hazard map/analysis and disaster risk map/analysis are fit in the stage of spatial planning process in Indonesia? By reviewing the documents on spatial planning in Indonesia, this paper offers how the disaster hazard and risk analysis can be used in the spatial plan to accommodate the mandate of the spatial plan law to be based on disaster mitigation. As the result, hazard map is used for disaster information, while, disaster risk map has not been not used yet. Hazard map also used as one inputs to develop the land capability unit in spatial plan.

Keywords: Indonesia; Spatial Plan; Disaster Risk Analysis

1. Introduction

As mandate of Spatial Planning Law [11], disaster should be considered in spatial planning. Currently, disaster risk is not considered yet in the spatial plan. It only considers hazard to determine the spatial pattern and as input for land capability. Therefore, it is assumed that disaster risk has not been integrated yet in spatial plan in Indonesia, even though, there are many studies have been conducted to integrate the DRR into spatial plan [7]. Sutanta, Rajabifard, & Bishop [7] proposed the disaster risk index to be considered in the spatial plan. Greivinng, et al. [3] stated that spatial plan does not consider the risk analysis yet.

This paper is try to review the integration of disaster risk into spatial planning in Indonesia based on the previous study on disaster risk integration into spatial planning, related regulation, and practice in the integration of disaster risk in the development of spatial plan in several area in Indonesia.

2. Methods

This research used qualitative approach to answer how the disaster risk analysis is used in the spatial planning document in Indonesia. In-depth interview with purposive sampling and related documents and regulation review were conducted. Local Planning and Development Agency of West Java Province and Karawang District, as well as Ministry of Agriculture and Spatial Plan (Ministry of ATR) were interviewed to gain information regarding the use and the integration of hazard and disaster risk map. This study is also enriched by information from the study of spatial plan in disaster prone area in Pacitan Regency, East Java Province. Descriptive analytic was used to analyze all of data and information gathered.

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3. Results

Spatial plan can be used as one of non-structural mitigation to reduce the particular disaster risk in the future [2] [3], therefore, predicting future risk is important in the development of spatial plan. Currently, general spatial plan (RTRW) uses hazard map to be integrated into their spatial plan, such as in Karawang Regency and West Java Province (one-on-one discussion with Bappeda staff, 2016; [8][9][10]. This hazard map is used to calculate "*Satuan Kesesuaian Lahan*" or Land Capability Unit. They did not use risk analysis in their spatial plan. Meanwhile, currently, Ministry of Agriculture and Spatial Plan (ATR) is developing guideline to integrate the disaster risk analysis into spatial plan. It also has conducted study on spatial plan in disaster prone area in south coastal of Java Island and also in Sinabung, North Sumatera Province. This risk analysis was conducted to know the risk condition in the area, so that it will imply to the spatial structure and pattern [14]. Similar study was conducted by MPW, ITB, and JICA [4] that try to integrate the DRR and CCA into spatial plan. Within the study, MPW, ITB, and JICA [4] as well as Ministry of ATR [14] refer to the Head of BNPB Regulation No. 2/2012 in calculating the risk. They used risk index to develop risk map to find out the risk condition in one area, especially in strategic area. They use several indicators, such as social and economy to calculate the risk index. Sutanta, Rajabifard, & Bishop [7] also proposed risk index in the integration of disaster risk into spatial plan. The risk becomes input to revise the spatial plan, even though, mostly is used as input in the general zoning regulation.

In Karawang Regency, the spatial plan has not integrated the disaster risk analysis yet as stated in Local Regulation No. 2 Year 2013 concerning Regional Spatial Plan of Karawang Regency 2011-2031. But substantively, the direction of land use has considered the flood, rob, and landslide hazard, which are generally described in the document of spatial plan. Flood hazard map that Karawang Regency used in spatial plan is flood hazard map from the local planning and development agency (Bappeda) of West Java Province. They do not develop their own hazard map.

From the study in Pacitan Regency as well as in Garut Regency for spatial plan in disaster prone area, hazard map that was developed are used to determine the spatial pattern. For example, hazard map of tsunami inundation based on certain scenario was used to determine the wide of coastal demarcation in Pacitan Regency. Hazard map of flood inundation in Garut Regency is also used to determine the wide of river demarcation stated in spatial plan. All area with high rank of hazard map should be relocated and in spatial plan it should become green area. Hazard map used was based on that produced by authorized institution, such as Meteorological and Geophysical Agency (BMKG) for climate-related hazard, Centre for Volcano and Geological Disaster Mitigation (PVMBG) for earthquake, landslide, etc, and also based on study from related institutions such as GTZ institution/GITEWS for tsunami hazard. If this certain hazard map is not available, then the planning agency develop the hazard map based on empirical and historical information of disaster occurred in the area, such as flood hazard map in Spatial Plan of Bandung City as well as flood hazard map in Garut Regency. Planning Agency of Bandung City uses historical flood event to be pointed in the hazard map in spatial plan. It becomes an indicative hazard map. Similar with Bandung Municipality, the flood hazard map in Garut Regency also developed based on the impact of flood disaster that occurred previously. This map is overlay with basic map as well as land use map. Based on the overlay map, the high level of hazard area should be free from the activity, it should become green area. If there is settlement in hazard area, it should be relocated to another safer place within the regency or municipality. Therefore, it also requires the information regarding the free land owned by government as alternative for the relocation place, which should not prone to certain disaster. For example, in Garut Regency, the area along the Cimanuk River should be free for 100 meters wide, because it is affected by flood disaster. It becomes input to spatial pattern that within 100 meters of river demarcation should be a protected area, not a cultivated one.

It also found in Pacitan Regency, based on tsunami hazard map provided by GITEWS, the tsunami inundation is about 500 meter from the coastal line. Based on President Regulation No. 51 Year 2016 (article 1), the coastal demarcation should be minimum 100 meters from coastal line to the land and it should be adjusted with tsunami disaster risk level (article 7). If we use the information about tsunami inundation, the spatial pattern of Pacitan Regency, especially in the coastal area, 500 metres from the coastal line should be determined as protected area and the settlement in the area should be relocated. But we can use risk information of tsunami disaster. The topography in the southern part of Pacitan Regency is hilly. Hill near the coastal can be used as natural temporary evacuation shelter, which the distance is less than 500 meter. Except in two sub districts, all area in the southern coastal area of Pacitan Regency are free from settlement and the activity mostly are related to tourism matters. Therefore, taking into account the foregoing as well as the direction of development of the south coast as a tourist area, the concept of spatial planning in Pacitan Regency will more adopt mitigation or adaptation and disaster risk reduction of protection instead of relocation. Based on guideline on spatial plan in disaster prone area, there are three types of mitigation or disaster risk reduction in spatial plan, i.e. relocation, adaptation and protection.

Relocation is an effort to handle the disaster-prone areas through efforts to transfer the following activities to activities supporting facilities safe from disaster zone includes the concept of resettlement (resettlement).

Resettlement is a concept that is very appropriate to be applied to post- disaster phases. Resettlement (resettlement) in disaster relief efforts to relocate populations that is prone to natural disasters due to the location of existing settlements in a high risk of certain disaster. Resettlement or relocation of settlements can be done before the disaster, according to disaster risk reduction policies, or do post-disaster because society is not possible to go back to the original settlement. The standard location of resettlement for each type of disaster in general has the same criteria. In determining the location for resettlement not only considers the physical and environmental aspects, but also the socio-economic condition of the community. The place for relocation should fulfill the following criteria, such as the area should not be located in the disaster prone area, the area should be owned by government, the availability of transportation infrastructure, the availability of utility infrastructure, etc. Adaptation is a disaster risk reduction through the adjustment of the area with a potential hazard. Adaptation may be building code, temporary evacuation shelter, evacuation routes, early warning systems, etc. Protection is to protect the area from the potential hazard by improving the quality of the natural environment. Protection can be the development of breaking wave, sea wall, control of the use of space on Protected Areas (coastal border and greenbelts (mangrove forests, mangroves, open green spaces)), planting crops/trees mangroves as a green belt along the coastal). Coastal border is a need for an effort to protect the area and control the destructive force of the tide. Another example of protection is Maintain and/or restore the function of green space as a greenbelt in the coastal border lines (100 m from the beach). The presence of green plants (RTH) on this coast will hold and break the power of sea waves towards the mainland.

From the above explanation, most of spatial plan still consider hazard analysis that manifested in hazard map is used in general spatial plan (to see the disaster prone area) to determine the spatial pattern and structure in small scale map, Risk information that manifested in disaster risk map, should also be used to consider the determination of spatial pattern and structure, especially to determine which area either become protected or cultivated area, also where to locate the temporary evacuation shelter as well as the evacuation route. Beside, the risk information could also be used for detailed spatial plan and zoning regulation for reducing the possible risk in the future

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Building Transformative Adaptation: Comparing Pekalongan Municipal Government's and Community's Initiatives on Minimizing the Risk of Coastal Inundation

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Abstract

Since 2006, coastal inundation was reported start to entering community's agriculture land in Northern part of Pekalongan, Central Java, Indonesia. The exposure was covering most of paddy fields and fishpond. The disturbance has become bigger, when the exposure of coastal inundation has start covering some part of settlement areas in 2010. Increasing salinity forced people to stop paddy cultivation and try to find a new way for living. Pekalongan Municipal Government has prepared Pekalongan City's Resilience Strategy (PCRS) in 2010 in cooperation with PAKLIM-GIZ which conducted by involving local stakeholders participation. One of those strategies has been addressed to minimize the risk of coastal inundation. In terms of PCRS implementation, there are some possibilities for the local community to have their own planning interpretation differently. This paper aims to evaluate the implementation of PCRS by comparing Pekalongan municipal government's with community's initiatives through transformative adaptation. The evaluation upon those initiatives was conducted by comparing planning and implementation on related Pekalongan Municipal Government Agencies and community's actions. Data collection was conducted by some interview with several key informants that reveal from purposive sampling method. Those key informans consist of related Pekalongan Municipal Government Agencies and local community figures in Northern Pekalongan Sub-district. This research finding reveals that Pekalongan Municipal Government implies double standard of development, regarding both of economic and environment priority. However, the coastal community prefers to choose a new livelihood which gives them not just economic but also social and ecologic benefit.

Keywords: Coastal Inundation, City Resilience Strategy, Local Government Initiatives, Sustainable Development Goals, Sustainable Livelihood, Transformative Adaptation

1. Introduction

Many coastal areas are vulnerable to increasing inundation as an impact of Sea Level Rise (SLR). Recently, many coastal areas in Central Java Indonesia are already subject to coastal hazard due to tidal inundation and flood. The impact of the inundation is predicted to be even more severe with the prediction of sea level rise in the next 20-100 years [1]. Extended coastal inundation has become endangered coastal community livelihood.

Since 2006, coastal inundation was reported start to entering community's agriculture land in Northern part of Pekalongan, Central Java, Indonesia. The exposure was covering most of paddy fields and fishpond dykes. The disturbance has become bigger, when the exposure of coastal inundation has start covering some part of settlement areas in 2010. Increasing salinity forced people to stop paddy cultivation and try to find a new way for living. People come up with some choices as alternative to altered and adapt their livelihood. They tried to learn new thing, such as milk-fish, shrimp or prawn and sea-weed cultivation. Considering the difficulties and opportunities in doing those new experience and regardless their existing skill capacity, technique and knowledge, they force to decide what the best option for living. This paper will evaluate what choices have made by coastal farmers on Northern Pekalongan Sub-district.

Pekalongan Municipal Government has prepared Pekalongan City's Resilience Strategy (PCRS) in 2010 in cooperation with PAKLIM-GIZ which conducted by involving local stakeholders participation. One of those strategies has been addressed to minimize the risk of coastal inundation. In terms of PCRS implementation, there are some possibilities for the local community to have their own planning interpretation differently. This paper aims to evaluate the implementation of PCRS by comparing Pekalongan municipal government's with community's initiatives through

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transformative adaptation. The evaluation upon those initiatives was conducted by comparing planning and implementation on related Pekalongan Municipal Government Agencies and community's actions.

2. Methods

Using qualitative approach, case study research was occupied to answer the question of 'why and how' [2]. Deep knowledge of an individual could give much useful information instead of hundred respondents who do not know anything or have limited knowledge [3]. Data collection was conducted by some interview with several key informants that reveal from purposive sampling method. Those key informants consist of related Pekalongan Municipal Government Agencies and local community figures in Northern Pekalongan Subdistrict. Some triangulation have been done to gain data validation and verification. This triangulation involve related donors and NGO.

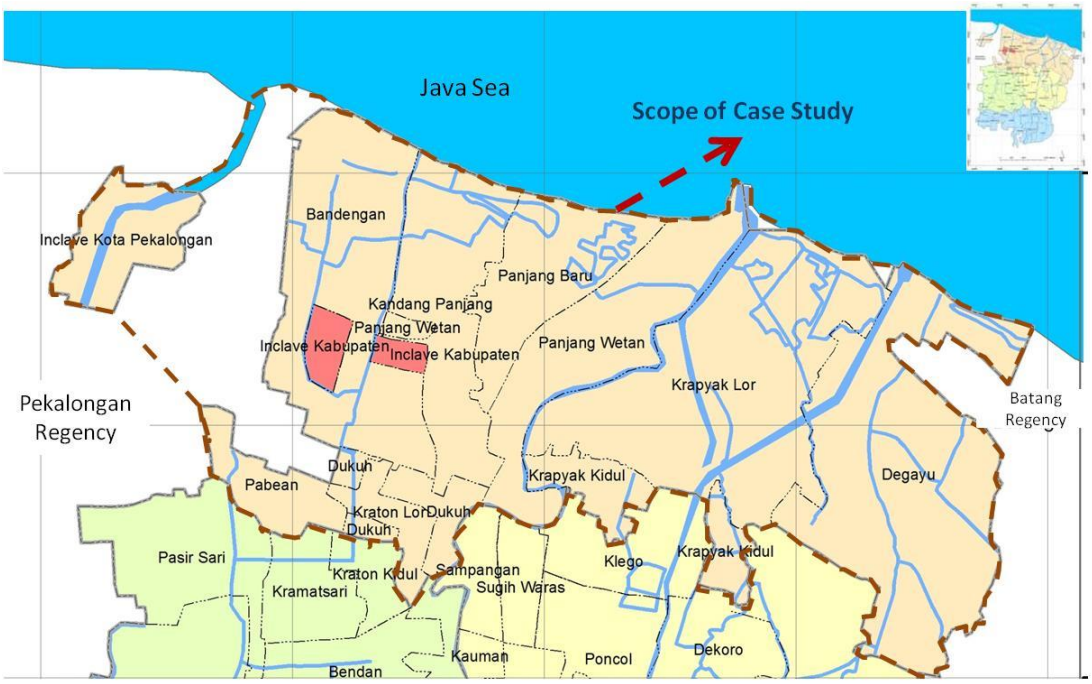

Figure 1 The scope of case study

Scope of case study area consists of 6 sub-districts on North Pekalongan District, namely Bandengan, Padukuhan Kraton, Kandang Panjang, Krapyak, Panjang Baru and Degayu. See Figure 1 which conveyed the location of scope of case study. Those areas selected based on the most recently inundated area, which have triggered communities' to elevate their capacity from vulnerable to cope with, adapt and recilience. Considering increasing community's capacity as a process, there were various achievement on each process respectively [4]. Those transformative adaptation was identified by community experienced, novel knowledge on reducing their vulnerability by minimized risk of coastal inundation, especially on livelihood adjustment either alteration or diversification.

Evaluation analysis has been done based on PCRS implementation performance bay assessing development outputs/outcomes on social, economical, physical and ecological aspects. Elaboration some important findings which were suported to related SDGs achievement were needed in order to compare Pekalongan Municipal Government and communities' initiatives.

3. Results

Community initiatives on economical and ecological development aspect were determined based on their transformative adaptation which were indicated by livelihood choices. Table 1 conveyed coastal farmer's consideration on livelihood choices. Their choices was decide based on how does their activities have potential benefit and cost, what kind of potential risk and failure related each choices respectively and what kind of consequences in terms of livelihood sustainability. Prior community on agriculture and aqua-culture livelihood were paddy/ jasmine/mangrove cultivation, fishpond fisherman and combination of it. Since coastal inundation were entering their paddy fields, salinity of land has been increasing and their paddy/jasmine were stop to grow. Livelihood altering were

found from paddy/jasmine cultivation to milk-fish/tilapia cultivation at the beginning of transformative adaptation and vaname-shrimps or sea-weed cultivation on the advance process of it.

Table 1. Coastal Farmers Consideration on Livelihood Choices

Livelihood	Possible Benefit	Possible Cost	Supporting to SDGs Achievement
Mangrove Cultivation	• Protection from abrasion • Bio-diversification (mangrove, prawn, shrimp, & wild fish) & economic benefit	None (due to ecological consideration)	High
Shrimp/Prawn Cultivation on Fishpond	• High Economic Value • Fulfilling Export Demand • Prawn cultivation give more income for farmer	• Total production was decreasing after 2 years due to chemical feeds and drugs • Increasing threat of Mangrove extinction due to altering land cover to fishpond dykes	Low
Paddy Crops on Paddy field	• Huge productivity until beginning of 2004 & decline until 2006 • High economic value • Give farmers ability to pay the cost of pilgrim	Increasing chemical fertilizer uses	None, as consequence of increasing salinity
Jasmine Plantation	• Huge production until 2010 as paddy intercropping • Fulfilling the need of Jasmine Tea Industry • High economic value • Ability to fulfill children education tuition fee until bachelor degree	Increasing chemical fertilizer uses	None, as consequence of increasing salinity
Milk-fish Cultivation	• High tolerance with pollutans • Small capital and low cost of maintenance. • Simple technology • Fishing as attraction activity on local tourism	soil-smelling milk-fish due to low water supply in dry season, push down the selling price	• Medium sustainability • Farmers did Milk-fish cultivation as side job not primary livelihood
Tilapia-fish Cultivation	• High tolerance with pollutans • Small capital and low cost of maintenance. • Simple technology • Fishing as attraction activity on local tourism	Risk of drift out fishpond due to flooding	• Medium sustainability • Farmers did Tilapia-fish cultivation as side job not primary livelihood
Vaname Shrimps Cultivation	• High price and demand • Milk-fish and Tilapia fish on filtered pond as positive externalitas of vaname cultivation	• Big capital • High cost of maintenance • Vulnerable with some desease • High risk of crop failure • Total production was decreasing after 2 years due to chemical feeds and drugs	• Low sustainability, • need government support in cooperation with private sector
Sea-weed cultivation	• Small capital with low cost maintenance • High tolerance with pollution • The role of Milk-fish and Tilapia fish as pest-plant eater	• Need dyke-fishpond support • Threat of chemical utilization as farmer choices on anorganic farming due to push up the production volume	• High sustainability (if kept on organic farming) • Potential to give either economic, social or ecological benefit as a production package

Compare to community initiatives, Pekalongan Municipal Government Agencies performed programs implementation on several aspect of development which selected related to Pekalongan City's Resilience Strategy.

Evaluation on implementation of Pekalongan Cities resilience strategy reveal with some results. PCRS which made in 2010 have been experiencing some difficulties, since it have not been reinforced and supported by any special Cities

Act. Therefore, the implementation of strategies and actions have not optimal yet. However, several actions inlined with some Municipal Agency's Programs and Projects. Considering goals of Pekalongan City's resilience, many of them mostly were intend to reduce city's emissions through related development's sectors as mitigation attempts. Therefore, many adaptation programs which involved community capacity and resiliency enhancement attempts become less priority.

The development orientation was considered more on physical aspect such as public infrastructures, which has become either local, regional or national goverment's authorities. Social economic aspect especially on building socio-ecological resilience has become the second layer of development. Controlling flood and coastal inundation strategy due to increasing rain intensity have been targeted as risk reduction on 2015. City's drainage planning and improvement program done by DPUPR (Pekalongan Public Works and Settlement Agency). Neither selected city road nor paved road elevation on settlements area were considere on Pekalongan City's Resilience Action Plan. But surprisingly, regarding community satisfaction, it was efectively gave good performance on North Pekalongan District risk reduction attempts.

Drainage Masterplan has been made by BAPPEDA (Pekalongan's Development and Planning Board) in 2013. Therefore, there were some difficulties on financing polder system due to limited support from national budget (which were need more than 250 bilyun rupiahs). This polder system were planned to reduce inundation on east part of Pekalongan. However, there were some significant progress of drainage system improvement, since a big portion of inundated area in Slamaran, located on northern-east part of Krapyak Sub-district, has been succeeded to break free from inundation. This succeed was supported by river diversion management on Old Banger River.

Meanwhile, other sub-districts such as Kandang Panjang and Panjang Wetan have reduced the risk of inundation as an impact of city main road and local pave road elevation, from 30 to 60 cm high. However, there were some emerging negative externalities which has not been considered before, since road elevation at some area caused some new inundated area on surrounding settlements which have lower elevation.

Ecological sustainability become less important since mangrove conservation experiencing difficulties due to limited area for plantation, disturbance from coastal flood/inundation and unresponsible visitors. On the contrary, local government encourage on developing park and city forrest on the city centre instead on the coastal areas. Greening on coastal area mostly were intend to develop green pathways along the beach with shade's tree planting. However, there was Mangrove Information Centre (MIC) which give new experience for people to learn how mangrove conservation were managed. Information include plantation-demo on at least 2 mangrove species, namely Red Mangrove (Rhizopora Mongle sp.) and Black Mangrove (Avicenia Germinans sp), from seedling, planting, and keep them growing in limited area.

Creating community sustainable livelihood attempts as key of communities' resilience were excluded since there were limited related strategy and actions from municipal agencies. Some exception programs were done in cooperation with donors, regional NGOs and higher education intitutions related to integrating the mitigation and adaptation on environmental improvement attempts.

Pekalongan Farming, Fisheries and Marine Agency prefered to encourage vaname-shrimp cultivation which were high cost and not suitable with mangrove conservation. Some Mangrove leaves droped and floated on surrounding fishpond. Those inundated leaves could atrract some bacteria and viruses which caused vaname's desease. Unfortunetly, vaname cultivation also threatened the environment capacity due to utilization of chemical disinfectant for preventing vulnerable vaname from any potential desease.

This research finding reveals that Pekalongan Municipal Government implies double standard of development, regarding both of economic and environment priority. However, coastal comunities prefer to choose a new livelihood which gives them not just economic but also social and ecologic benefit is well.

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Perception Study About Visitors Related To Development Of Rowo Bayu Attractions in Kecamatan Songgon Banyuwangi

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Abstract

The development of tourism was a process of sustainability, and it was not stand-alone activity because it must involve various sectors. Tourism planning must take into consideration the existing condition and supporting capacity because it should create a long-term mutual interaction in achieving goals such as increasing community welfare and ensuring the sustainability of environmental supporting capacity in the future. Rowo Bayu Tourist Object was greatly potential to be developed into historical and also natural objects of scenery. Some historical heritages of Tawangalun Palace were exposed beautifully by the marsh and this situation could be cultivated into water-based tourism. However, Rowo Bayu Tourist Object still lacked of supporting facilities such as security post, parking lot, cleaning service, prayer house, and others, that led only to the inconvenience of the visitors. In this research, the perception of visitors on importance and satisfaction rates of tourist object-related variables was measured. These variables included attraction, accomodation, accessibility, facility, information, and utility, which were then subjected to the analysis technique of IPA. Result of analysis found 14 attributes that were important for tourist object development but in bad condition. These attributes were: the availability of security guard, the availability of food and beverage providers, the availability of transportation modes to the tourist object, the availability of parking lot, the availability of toilet, the availability of garbage can, the availability of information center, the availability of prayer house, the availability of ATM, the availability of fuel-station (SPBU), the availability of tourist object promotion tools, the availability of tour guide, the availability of electricity, and the signal strength of mobile phones. After IPA was finished, it was followed by AHP analysis. Result of AHP represented expert opinion. AHP was an analytical technique used when the decision was made with systemic approach. The decision-making model arranged multi- factor and multi-criteria problems into a hierarchy.

Keywords: Perception, Attraction, IPA analysis, AHP analysis

1. Introduction

The development is a capability which is determined by what we can do with what we have in order to to improve our quality of life [1]. The development area is a strategy in utilizing and combining with internal factors (strengths and weaknesses) and external factors (opportunities and challenges) as the potential and opportunities that can be exploited in improving income regions [4]. The development area is also called as an attempt to create an integrated use of resources, improvement of inter-regional harmony and integration between development sectors through a process of spatial planning [6]. The development area is one of the most appropriate way to improve the people welfare in it, one of which is to develop the tourism sector. Pendit [5] defines

Tourism is a journey that is done temporary from one place to another with the intention to not make a living in the visited places, but simply to enjoy the journey for recreation and leisure or to satisfy the desires from diverse variety. Tourism is process of traveling from one or more people in heading somewhere else outside their homes. The purpose of traveling is due to a variety of interests, either because of economic, social, cultural, political, religious, health interests and other such as simply want to gain knowledge in order to the gain experience or to learn new things. The tourism development is a sustainable process and is an integrated process from many sectors. Tourism planning must be based on the conditions and the carrying capacity in order to create a long-term mutually beneficial between achieving goals, improving the local communities welfare, and the sustainability of environmental carrying capacity in the future [3]. Banyuwangi Regency was famous with an epithet *Sunrise of Java*. It had many potentials of tourism. One was Rowo Bayu Tourist Object in Bayu Village, Songgon District. This

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tourist object was located nearby the historical situs of Blambangan Kingdom. However, it was given to improper management, and the number of visitors was quite few. Rowo Bayu Tourist Object had a great potential to be developed into historical and natural objects of tourism. The presence of Tawangalun Palace in the area had been situated by the marsh, and this landscape could be managed into water-based tourism. At the existing condition as recently observed, this tourist object was not equipped with facilities such as security post, parking lot, cleaning service, prayer house, and others that might disturb the convenient visiting. By taking this overview into consideration, the objective of this research was to understand the strategy to develop Rowo Bayu Tourist Object in Songgon District, Banyuwangi Regency, through bottom-up approach, in order to improve community income based on the perception of the visitor and the expert to facilitate the determination of rating of the sub-variables needed to develop.

2. Methods

Method of research was a quantitative description. Focus was given on the perception of visitors at Rowo Bayu Tourist Object. Some variables that were used to assess the perception of importance and satisfaction rates from the visitors were including: attraction, accomodation, accessibility, facility, information, and utility. Sample was taken with purposive sampling by which the subject in the sample was acquired because the subject was representative to the charateristic of population [2]. Number of sample was counted from the number of visitors using Slovin Formula at tolerance rate of 10% and accuracy rate of 90%. Final sample was 98 respondents, but it was then rounded into 100 respondents.

The analysis technique was IPA and it was done to understand visitors' satisfaction rate based on the aspect of importance and of satisfation. Before subjecting the data to the analysis, it derived from the result of questionnaire about community perception on the performance of a certain tourist object based on the predetermined indicators of assessment. Variable "X" was performance rate and variable "Y" was denoted for indicator importance rate. The conformity rate between performance and importance scores would determine the order of priority in how to increase factors influencing the satisfaction of visitors [7]object was set into Quadrant 4 (concentrate here). After IPA was finished, it was followed by AHP analysis. Result of AHP represented expert opinion. The expert in this analysis included community (village chief), academician (lecturer) and government (The Official of Tourism). AHP was an analytical technique used when the decision was made with systemic approach. The decision-making model arranged multi-factor and multi-criteria problems into a hierarchy.

3. Research Result

Tourism development plan in Banyuwangi Regency was focused on three tourism development regions (WPP; wilayah pengembangan wisata), respectively WPP I, WPP II and WPP III. Rowo Bayu Tourist Object belonged to WPP I with Ijen Crate as the leading view. In the last 5 years, Banyuwangi Regency had seen the quite dramatic development of tourism. Tourism potentials had succesfully increased local genuine income and also promoted Banyuwangi Regency as one regency in East Java Province with great diversity of tourist objects. Many tourist objects were situated in Songgon District, including Songgon Pine Forest, Lider Waterfall, Selendang Arum Waterfall, and Badeng River Tourism. Songgon District had been known well by the community of Banyuwangi Regency and also the outsider. All tourist objects mentioned above had produced greater number of visitors if compared to Rowo Bayu Tourist Object although this tourist object was the oldest site in Songgon District and containing the historical heritage of Tawangalun Palace. In the other hand, Rowo Bayu Tourist Object could not escape from the War History of Puputan Bayu occuring on 1771. The War of Puputan Bayu was a great clash between the people of Banyuwangi and the Dutch colonial government (VOC). In this war, the Dutch was defeated and suffering great losses. Rowo Bayu Tourist Object in Bayu Village, Songgon District, was quite attractive because besides providing historical tourism object, it was also providing natural scenery, at least through the presence of orchards. It was not suprising because this tourist object was a part of Songgon District Forestry Region under the responsibility of the Forestry Managing Unit of Rogojampi, West Banyuwangi. One potential in Rowo Bayu Tourist Object was a spread of marsh land at 8 meters depth. It resembled to a natural pool with genuine ecosystem. It would be regrettable if this potential was left unmanaged. The fact had showed that the number of visitors at this object was quite few, possibly due to the lacking of visitors' facilities and even the absence of amenities usually existing in the tourist object. The perception of the visitors at Rowo Bayu Tourist Object was used to measure satiscation and importance rates of tourist object-related variables, including attraction, accomodation, accessibility, facility, information, and utility of tourist object. This perception was measured using IPA analysis. Initially, there were 29 attributes that must be assessed to recognize their

satisfaction and importance rates based on the perception of visitors. The following was the average rates of satisfaction and importance of these attributes based on the perception of visitors at Rowo Bayu Tourist Object

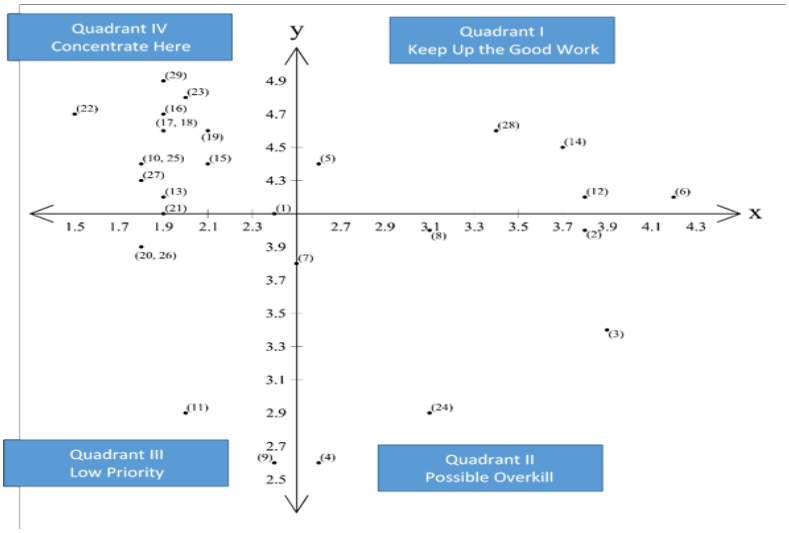

Fig. 1. Quadrant IPA analysis

Table 3. Attributes Analysis in Quadrant IV

Variable	Atribut	Analyze
Attraction	The availability of security guard	No security guard was available at Rowo Bayu Tourist Object, and it led visitors to feel incovenient during night tour.
Accommodation	The availability of food and beverage providers	Only one provider of food and beverage existed, and it was rarely standby on site when visitors needed meals and drinks at daylight.
Accessibility	The availability of transportation modes to the tourist object	All visitors must still use personal vehicle due to the absence of public transport to the tourist object.
Facility	The availability of parking lot	Parking lot for visitors was not available, and visitors found difficulty to park their vehicles.
	The availability of toilet	Toilet was not reliable and also in limited numbers. It caused hardiness to the visitors.
	The availability of garbage can	Only few garbage cans were provided and often concentrated. Thus, trash was found everywhere due to the dispersal discard.
	The availability of information center (Tourism Center)	There was no information center at Rowo Bayu Tourist Object. If any, it was only one and situated at the Office of Songgon District that was quite distant from tourist object.
	The availability of prayer house	Prayer house was not available at tourist object, which forced visitors to go to nearby prayer house.
	The availability of ATM and Money Changer	ATM facility was absent at tourist object. This machine was only situated in the capital of Songgon District, and only two machines were available.
	The availability of fuel-station (SPBU)	No fuel-station was found in Songgon District, and thus, visitors must buy fuel from retailer.
Information	The availability of tourist object promotion tools (brochures / pamphlets)	The promotion of Rowo Bayu Tourist Object was not optimum because there was no brochures and pamphlets available informing this tourist object.
	The availability of tour guide (travel agent)	Tour guide was absent. The only reliable informant was ticket seller.
Utility	The availability of electrical network	No electrical network at the tourist object which only induced sense of discomfort among visitors at night.

Variable	Atribut	Analyze
	The availability of communication network (signal strength)	The signal of mobile phones was weak. Often, it did not exist at all, which caused visitors facing trouble in communication.

These 14 attributes from IPA were subjected to AHP (Analytic Hierarchy Process). This follow-up was useful to recognize the most influential sub-variable in the development of Rowo Bayu Tourist Object. AHP was also functional to determine the rating of variables based on the interview with expert to decide which sub-variables on the priority to develop. All sub-variables in AHP were derived from IPA analysis, and these remained at Quadrant IV, which in this case, consisting of important sub-variables but at less satisfying condition. During the development of Rowo Bayu Tourist Object, AHP was a bottom-up planning control. In such planning, the government acted as the controller in the determination of priority for development. The conduct of AHP used a Software "Expert Choice" using 3 respondents, respectively: Community (represented by Village Chief), Academician (represented by Lecturer), and the official of tourism.

Table 4. Rating AHP Analysis

Variables	Attributes	Community	Academician	The Official of	Total	Average	Rating
Attraction	The availability of security guard	0.011	0.057	0.065	0.133	0.0443	7
Accommodation	The availability of food and beverage providers	0.046	0.077	0.010	0.133	0.0443	8
Accessibility	The availability of transportation modes to the tourist object	0.112	0.139	0.115	0.366	0.1220	4
Facility	The availability of parking lot	0.045	0.037	0.094	0.176	0.0587	5
	The availability of toilet	0.051	0.031	0.050	0.132	0.0440	9
	The availability of garbage can	0.026	0.025	0.047	0.098	0.0327	12
	The availability of information center (Tourism Center)	0.122	0.157	0.132	0.411	0.1370	3
	The availability of prayer house	0.042	0.028	0.078	0.148	0.0493	6
	The availability of ATM and Money Changer	0.013	0.017	0.011	0.041	0.0137	14
	The availability of fuel-station (SPBU)	0.015	0.021	0.013	0.049	0.0163	13
Information	The availability of tourist object promotion tools (brochures / pamphlets)	0.232	0.191	0.146	0.569	0.1897	1
	The availability of tour guide (travel agent)	0.172	0.163	0.176	0.511	0.1703	2
Utility	The availability of electrical network	0.045	0.018	0.038	0.101	0.0337	11
	The availability of communication network (signal strength)	0.067	0.039	0.024	0.13	0.0433	10

Based on the average rates given by all respondents, few variables were considered as having the greatest importance rate. One was information variable, represented by the availability of tourist object promotion tools and the availability of tour guide. Other was few sub-variables of facility attribute, involving the availability of information center (tourism center) and the availability of transportation modes to the tourist object.

4. Conclusion

Pursuant to the result of analysis, conclusion could be inferred as following. Banyuwangi Regency had great potential tourism sector. It was proved by great number of visitors to tourist objects which in turn it helped increasing local income. The development of tourism sector in Banyuwangi Regency might generate the effort to improve the feasibility of facilities at tourist objects, and consequently, would help promoting the existing tourist objects. However, the existing condition in Rowo Bayu Tourist Object was still needing for specific attention because as perceived by visitors, there were 14 important attributes at tourist object but those existed in bad condition (less satisfying state). Specific action must be taken to deal with problematic attributes. These attributes were: the availability of security guard, the availability of food and beverage providers, the availability of transportation modes to the tourist object, the availability of parking lot, the availability of toilet, the availability of garbage can, the availability of information center, the availability of prayer house, the availability of ATM, the availability of fuel station, the availability of tourist object promotion, the availability of tour guide, the availability of electricity, and the signal strength of mobile phones. In regard to result of AHP, the most important attributes for development were found in information variable, especially the availability of tourist object promotion tools and the availability of tour guide, and also in facility attribute, represented by the availability of information center (tourism center) and the availability of transportation modes to the tourist object. It was expected that the result of this research could be used as the base reference for the development of Rowo Bayu Tourist Object.

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Analysis of Perception and Community Participation in Forest Management at KPHP Model Unit VII- Hulu Sarolangun, Jambi Province

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Abstract

The concept of forest management at the site level in the form of forest management units (KPH) implemented by the government in an effort to improve forest governance in Indonesia. Forest management must ensure fairness for all stakeholders, especially indigenous and local communities that have been the most marginalized groups. Local communities have become an important part in the efforts to achieve sustainable forest management. Public perception as one of the stakeholders in forest management need to be analyzed to determine their perspectives on the forest. People who have a good perception (positive) on the forest tend to perform positive actions, and vice versa.This study aimed to analyze the perception and the level of community participation in forest management activities in KPHP Model Unit VII- Hulu Sarolangun, as well as examine the relationship between these two variables. Perception variables are divided into three categories: good, moderate and bad, while the participation variable is also divided into three categories: high, medium, and low. The data collection is done by interviewing and distributing questionnaires to randomly selected respondents. Validity and reliability tests conducted on the research instrument. Chi-square analysis is used to determine the relationship between the perception of the level of community participation. The results showed 90,16 % of people have a good perception and the remaining 9,84% have a moderate perception. In general, community participation is at a low level that is as much as 78,76 % and only 1,55% had a high participation rate. Statistic analysis showed that there is no relationship between the perception and the level of community participation in forest management. The results of this study can be taken into consideration for KPHP and other stakeholders in forest management policy in the region KPHP

Keywords: Community perception, Community participation, KPHP

1. Introduction

Deforestation in Indonesia is a reflection of the failure of the management of forest resources. The rate of deforestation in Indonesia in the period 2009-2013 is estimated to reach approximately 1.13 million hectares per year[1]. Jambi province alone in the period 2012-2013 has recorded a deforestation rate of

91248.3 ha / year. This figure is the second highest after the province of West Kalimantan with a deforestation rate of 273 355 ha /year[2]. The high pressure by activities outside the forest sector such as agriculture and mining, poor forest management performance and weak supervision are several factors that cause more damage to forests. Improving forest governance through the concept of forest management at the site level in the form of forest management units (KPHP) is one way to overcome this problem.

KPHP Model Unit VII- Hulu Sarolangun is one of 17 KPH region in the province of Jambi. The decline in the condition of forest resources and poverty in forest communities encourage the strengthening of forest management approaches that involve the community. As a forest management organization at the site level, KPHP required to accommodate the interests of local communities. It is in line with the increasing recognition of the rights of local communities and their ability to manage their environment. Authority devolution to the local people in the management of natural resources and the environment is a response to the poor performance of centralized management system and communities are given the authority to be involved in decision making [3]. Emphasis participatory approaches in natural resource management aims to align the conservation efforts with the

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achievement of sustainable development goals. Community based natural resources management is a popular approach in environmental management in order to achieving towards the objectives of economic, social and environmental [4]. Some studies indicate that the involvement of local communities in forest management gives significant impact on the improvement of forest conditions biologically and household income levels [5]. Community participation is an important component to encourage them to utilize their resources sustainably [6]. Stakeholder participation prove the existence of enhancement on the quality of decisions made in environmental management. Stakeholder participation should be supported by a philosophy that emphasizes the principles of empowerment, equality, trust, and learning. In the process should have clear objectives and able to integrate the scientific knowledge with local knowledge [7]

The public perception as one of the stakeholders in forest management need to be analyzed to determine their perspective on the forest area. Public perception of the environment affects their attitudes and behaviors. There is a positive correlation between public perception with their level of participation in natural resource management Increased public awareness and active participation is required to support the achievement of sustainable forest management [8]. The difference in age and livelihood typologies also influence the public perception of the forest conditions [9]. The success of conservation efforts in natural resource is determined by the support of local communities highly affected by perception and their opinion on the perceived impact of these activities[10]. There was a tendency where the community choose to defer involved in a project until they can see favorable results from it [11]..Communication is an important component to improve the community involvement in natural resource management activities. When the effective communication is established, then the community will be aware and well-informed about what is happening in every phase and their role in it [4]. The government's commitment to ensure and admits the right of communities in the forest resource use and be accompanied by efforts to increase awareness about the need to conserve forests is one of the factors that can affect the level of community participation 12]. The conservation efforts on the forest resource determined by public perception on equity in the distribution of the benefits they acquired as compensation for what they have done [13]. This study aims to determine the perception and public participation in the management of forests in the region KPHP Model Unit VII- Hulu Sarolangun and to analyze the relationship between perception and level of community participation.

2. Methods

This research was conducted at two the village in around the KPHP region. Both villages are part of some villages that were targeted implementation of collaborative forest management program drafted by the KPHP. Data was collected through semi-structured interviews and surveys. Interviews were conducted with key informants who are considered to have understanding of and influence in the decision-making from respective stakeholders include village apparatus, provincial forestry agencies, the head of KPHP, NGOs, and academics. The interviews were conducted to determine their perception of the existence of local communities in forest management and aid to understand the factors that affect the community participation. While the method of the survey done by giving questionnaires to 193 respondents who are patriach and randomly selected. Against the questionnaires were distributed to test the validation and reliability to generate the valid and reliable research instruments. Each question from questionnaire of the variable perception and participation using 3 points of measurement scale.

Public perception variables analyzed and grouped into three categories : good, moderate and bad. The public has a perception of good if they realize that they depend on forest resources and desires that these resources are managed sustainably; moderate perception if the community realizes his dependence on forest resources, but do not understand if the resource should be managed sustainably; and included in the category of bad perception if people have other interests that make them inclined to think no need to preserve the forest[14]. To assess the level of community participation, the analysis conducted on the frequency of community engagement at every stage of management from planning, implementation, monitoring and evaluation. The higher frequency of community involvement in every stage of the activity, the higher the level of their participation in forest management. Variable levels of community participation are grouped into three categories: high, medium, and low. Analysis using the Mann-Whitney U-test was conducted to determine whether there are differences in perception and public participation between the two villages where research was conducted. In order to determine whether there is a correlation between the perception and the level of participation then performed Chi-square test. The entire statistical analyzes were performed using IBM SPSS Statistics software Ver. 22.

3. Results

Analysis of the perception showed that 90,16% of people have the perception of good and 9,84 % had a moderate perception. Meanwhile 78,76 % of the people have a low participation rate, 19,69 % have moderate participation rate, and 1,55 % high participation rate. The low level of public participation is caused by low levels of understanding of KPHP as the competent authority of forest areas with all of the policy implemented. Lack of socialization and communication is established between KPHP and community are the factors that cause it. KPHP operational are relatively new so the benefits of the program implemented yet significantly perceived by the public. It became one of the reasons for the lo w level of public participation. Limitations of the funds and human resources in KPHP be one reason for the lack of interaction undertaken by KPHP with the community. In the forest management activities, community tends to serve as the object of the program planned by KPHP. Two village where the study has a different distance to the forests so that the Mann-Whitney U-test was conducted to determine whether the distance from the village to the woods to influence the perception and public participation and the result is there is no difference between the perception and the participation of both villages. Results of analysis using Chi-square test showed that there is no correlation between the perception of the community with the level of their participation in forest management activities. The results differ from the results of a study conducted by Ayunita and Hapsari [8] that show a correlation between the two variables. it is because most of the people feel the benefits from management activities that encourage people to actively engage in those activities.

4. Conclusion

Based on the above analysis it can be concluded that the community has a good perception of the forest area in the region KPHP, but has a low level of participation in forest management activities. Community has a good perception because they are aware of the importance of forests for their lives, they felt it necessary to maintain its sustainability. Several factors indicated to provide influence in management activities, among others, economic factors and communication. The principle of equality, trust, and learning should be emphasized in every process followed in this activity.Efforts should be made to provide insight to community about their important role in forest management. Participatory approach through NGOs, local extension workers, and community leaders could become a solution in order to bridge communication between KPHP and society. Limited human resources owned by KPHP can be solved by optimizing the existing role of forestry extension and to note is the skill of the facilitator also needs to be improved in accordance with the dynamics that occur in the community. Transparency in every stage of activities needed to build a relationship based on mutual trust. Government support in terms of funding and human resources required to assist KPHP in program implementation.

Assisting and training programs have been conducted by both NGOs and government agencies to improve community skills. The program is done in order to reduce community dependency upon forest resources in fulfilling their needs, but the program has not had a significant impact for improving the welfare community. The program is generally implemented on the project-oriented and sometimes it can only benefit a handful of parties. The conditions made possible a reluctance of people to participate in management activities, so that future needs to do a paradigm shift in programming for the communities where the program is offered in accordance with what is required by community.

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Sustainability and Vulnerability: Understanding the Anomaly from Disaster Perspectives Case Study: GlagaharjoVillage in Mount Merapi

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Abstract

In concern with human safety, the Government's policy to relocate people living in disaster prone areas is twofold: it is perciptably profound yet socially cataclysmic. The anomaly created by the contradiction between the need for sustainability and the realities in terms of vulnerability has been identified in Mount Merapi. Communities who live particularly in the Hazard Zone III of Merapi particularly in Glagaharjo Village, are well known for their persistent refusal towards the relocation program despite the potential catastrophic impacts of eruption hazards they might encounter. It is the task of each planner and decision maker nowadays to ensure that the relocation program could be well implemented by primarily revealing the factors underlying these communities' emotional attachment to their former neighborhoods and houses through an interdisciplinary study. For this reason, the research on which this paper is delivered, utilized a Likert scale-questionnaire and a statistical analysis program for data tabulation and interpretation. While to maintain the specific scope of the research, theoretical reviews colaborating the concept of place attachment, place dependence and place identity, was established to provide not only bases for interpretation or analytical thinking, but also those from which research parameters and variables were finally derived.

Keywords: relocation; sustainability; vulnerability; emotional attachment; interdisciplinary

1. Introduction

The issue of sustainability commonly rises when the presence of a particular being is vulnerable to certain events, such as wars, starvation, political turmoil and natural hazards. Despite this belief, many cases evidence that when sustainability comes to its realization, this concept must encounter a complex circumstances. This particular issue could be found in the case of Yogyakarta and Central Java particularly after the Merapi's eruption event in 2010. To promote safety for people living nearby the caldera of Merapi especially due to the volcano's deformation, the Government of Indonesia authorized a revision on Merapi's land use zonation and initiated a relocation program. Although the program is acclaimed successfully conducted in terms of the shelters establishment, it should be noted that from 3,612 households targeted to relocate, there are 1,059 households refused this program and among them living in the most deadly zone of Merapi including Glagaharjo Village, District of Cangkringan, Region of Sleman in the Province of Yogyakarta Special Regions [3].

Despite all the efforts made by the Government, these communities still preferred to reconstruct dwellings on their former neighborhood. From psychology stand point, this phenomenon reflects their emotional attachment to their origins in this regard, maintaining proximity to particular object is the main characteristics of place attachment [1]. As a container for repository of memories, place has a special meaning to a person or certain social group after experiencing repeatitive personal, social and cultural events within it. Therefore, place attachment happens when people have a positive perceptions toward it and becomes affective after prolonged experience in it which creates an emotional bond [2][5]. Given the significance of intermediating the communities' needs in Glagaharjo Village with the Government's plans, this paper will examine the factors determining these communities attachment to their origins and to purpose design criteria for appropriate dwellings or neighborhood.

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2. Methods

This paper is based on a research employing interdisciplinary approach through which knowledge from other fields are integrated into the field of architecture [4]. Its focus on human experience also leads this study to employ phenomenology as the research paradigm which is acknowledged for its attempts of eliminating any presuppositions [6]. Considering the time given, the sample unit is determined 100 households representing 656 households who refuse the relocation program in Glagaharjo Village. The sampling unit is purposive-type and thus, it will require some criteria of selection [7] in which the respondents must: 1) have settled in the Hazard Zone III of Merapi for at least ten years; 2) have shown a persistent refusal to the relocation program.

To measure each respondent's attitude on the given subject, Likert scale technique is adopted with indicators displaying the respondent's attitude on each subject from very disagree (1) to very agree (5) including 'do not know' option. All similar descriptive responses are grouped in a tabular format and then calculated by utilizing the IBM SPSS Statistic 20 software and then categorized based on the similarity of all responses toward each question. In this regard, low category indicates 0% to 20% of all the observed respondents in the sub village who have a similar opinion about the given subject, medium category which indicates 21% to 40%, high category which indicates 41% to 50% and very high category which reaches above 50% of all the observed respondents. In this case, the very high category is regarded as the most dominant responses that manifest the community's attitude including factors determining this community attachment to their dwellings and neighborhoods in each sub village in Glagaharjo Village.

3. Results

The responses from Kalitengah Lor sub village indicate that the place dependence aspects are the dominant factors influencing the people-place attachment in this sub village. More than 50% of the local respondents stated that activities mainly related to economy along with other activities socially and culturally were intensively performed in this place. Beside these reasons, the volcano's environment is also seen to have contributed in fulfilling their needs for live stocks. Regarding motivation aspect, more than 50% of the local respondents stated that their preference to stay in the former dwelling is encouraged by following factors: (1) The dwelling is a family's legacy; (2) The dwelling's location is relatively near from the local's social and health centers; (3) The local's belief mentioning that Merapi will survive from disaster impacts; and (4) The existence of emergency shelters and evacuation centers nearby their neighborhoods on the other hand, encourages the sense of being safe/secure to remain stay in their former dwellings. In the perception aspect, local wisdom towards disaster mitigation is perceived as an effective mechanism to increase their awareness to hazard risks and eruption impacts while its social bond is seen strongly maintained and important in regards with this local resilience to eruption hazards. When being asked about their experience after 2010 eruption event, most respondents state that the evacuation process have been conducted effectively while in terms of eruption risks, respondents emphasize that they feel confident with their safety and security.

Fig. 1. The responses toward place attachment in Kalitengah Lor Sub Village

In the case of Kalitengah Kidul sub village, their motivations to stay are encouraged by factors: (1) It relates to their ancestors' messages; (2) There is a belief that Merapi's environment will survive from its impacts; and (3) Similiar with responses from Kalitengah Lor, the existence of emergency shelters and evacuation centers nearby their neighborhoods encourages safe feeling in their former dwellings. From perception aspect particularly towards the relocation program, the local respondents state that the weakness of temporary dwellings in relocation areas is caused by its position which is not reachable from economic sources while in terms of dwellings, they actually show a great understanding on their exposure to eruption risks. They also emphasize that an ideal dwelling should conform with the need of proximity to the existing economic sources. Regarding eruption, they perceive it as a disaster must be aware of while in terms of the Mount Merapi, it is seen as a source of life and bless rather than a source of danger. This community also perceives their cultural potentials as a useful mechanism to confront with the eruption risks and the local's social bond is perceived important to increase their resilience to eruption risks. Regarding the 2010 eruption event, the respondents state that the evacuation process have been performed effectively and also mention that they returned only less than one month after the eruption merely because they see their dwelling as a precious asset. In regards with eruption, respondents emphasize that they feel confident with their neighborhoods' capability of providing safety and security.

Fig. 2. The responses toward place attachment in Kalitengah Kidul Sub Village

In Srunen sub village, place identity plays an important role to influence the local's emotional attachmet. From motivation aspect, their preference to stay on the former land is encouraged on following factors: (1) The dwelling site is close to the local's public facilities; (2) It relates to their ancestors' messages; (3) They believe that Merapi will survive from disaster impacts; and (4) The existence of emergency shelters and evacuation centers nearby their neighborhoods on the other hand, encourages the sense of being safe/secure to remain stay in their former dwellings. Respondents in Srunen sub village state that memories from childhood and personal events have influenced them to keep a proximity to their former dwellings. While from the perception aspect, the locals see Merapi as a source of life and bless rather than a source of danger. This community also perceives cultural potential as a useful mechanism which enables them to develop awareness towards the eruption. Regarding the 2010 eruption event, the respondents state that they returned to their former dwellings only less than one month after the eruption because the dwelling is seen as a valuable property. They perceive the relocation program has not been effectively and properly transferred throughout the community and not supported with an adequate plan for their economy sustainability. Regarding eruption events, the respondents express their worries and to cope with the risks, they have designed a direct access oriented to the nearby streets or evacuation routes.

Fig. 3. The responses toward place attachment in Srunen Sub Village

4. Conclusion

Based on the research results, the Glagaharjo communities' bond to their dwellings is mostly encouraged by their dependence on Merapi's natural potentials or in other words, this attachment tends to be influenced by functional factors. Typically, attachment which occurs because of functional factors may not be as sustained as the emotional ones and thus, it is possible to provide those factors in another place just as in a new site of relocation. To provide an appropriate neighborhood, design criteria should be considered are: (1) The site of dwelling should maintain proximity to economic sources; 2) The site must be integrated with open spaces for economic activities; 3) The site should encourage the sustainability of the local's social relationship; 4) The site should be accessible to all public, social and health facilities.

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Disaster Risk Mapping of Kelud Eruption Case Study: Kasembon District, Malang Regency

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Abstract

Kelud volcanic is one of the active volcanoes in Indonesia. Kelud volcanic is located among Malang, Kediri and Blitar Regency. Last eruption on February 2014 affected Kasembon District with severe infrastructure demage, including roads, briges and agricultural land. Sendai Framework declare disaster risk can be reduce by provide information abaut exposure and all matters related catastrophic events. This study is aimed to establish disaster risk map of Kelud Volcanic Eruption by disaster risk analysis technique. The variable used to assesment level of disaster risk are hazard, vulnerability, and capacity. By overlay map of hazard, vulnerability and capacity, disaster risk level of Kelud Volcanic Eruptioan map are made. Disaster research finds that Pondok Agung and Pait village are the highly level risk, Bayem, Kasembon and Sukosari Village are the moderate level risk; and Wonoagung Village is the low level risk.

Keywords: disaster risk mapping, hazard, vulnerability, capacity

1. Introduction

Kelud Volcano is one of the most active volcanoes in Indonesia. Kelud eruption in the 20th century occurred in 1901, 1919, 1951, 1966, 1990, 2007, and 2014 (eruption cycle is 7-32 years). Characters eruption of Kelud Volcano is explosive that produce deposits phreatic, freatomagmatik, pyroclastic flows and pyroclastic fallout. Kasembon District is one of the districts with most vulnerable affected by the Kelud Volcano. According to the disaster prone areas (KRB) map of Kelud Volcano by PVMBG in 2014, Kasembon District is located at KRB I (in radius 7-10 km) and KRB II (in radius 10-14 km). The eruption on February 13th, 2014 is a very large eruption in the history of the eruption of Kelud Volcano. Thus, causing the loss of infrastructure, damage to houses, livestock commodities decline, damage to agricultural land, forest land and fish farming land also losses in the tourism sector of Kasembon District. Based on the above conditions, research is required to calculate the level of risk eruption of Kelud Volcano based on hazards, vulnerability and capacity. Disaster risk mapping is expected to be a reference in reducing vulnerability and increasing capacity in the face of eruption of Kelud Volcano in Kasembon District, Malang Regency.

2. Methods

Method used in this research is descriptive-evaluative, obtained from observation and questionnaires addressed to 370 selected respondents in Kasembon District, Malang Regency. The analysis technique used is the analysis of disaster risk by overlay hazard, vulnerability and capacity maps [2]. Process to estabilish disaster risk map of Mount Kelud Eruption discribe by Figure 1. Hazard map and vulnerability map overlayed based on matrix Table 1 to get hazard-vulnerability map [6]. Then, capacity map overlayed with hazard-vulnerabiility map based on Table 2 [6]. Disaster risk map of Mount Kelud Eruption formed after that overlay done.

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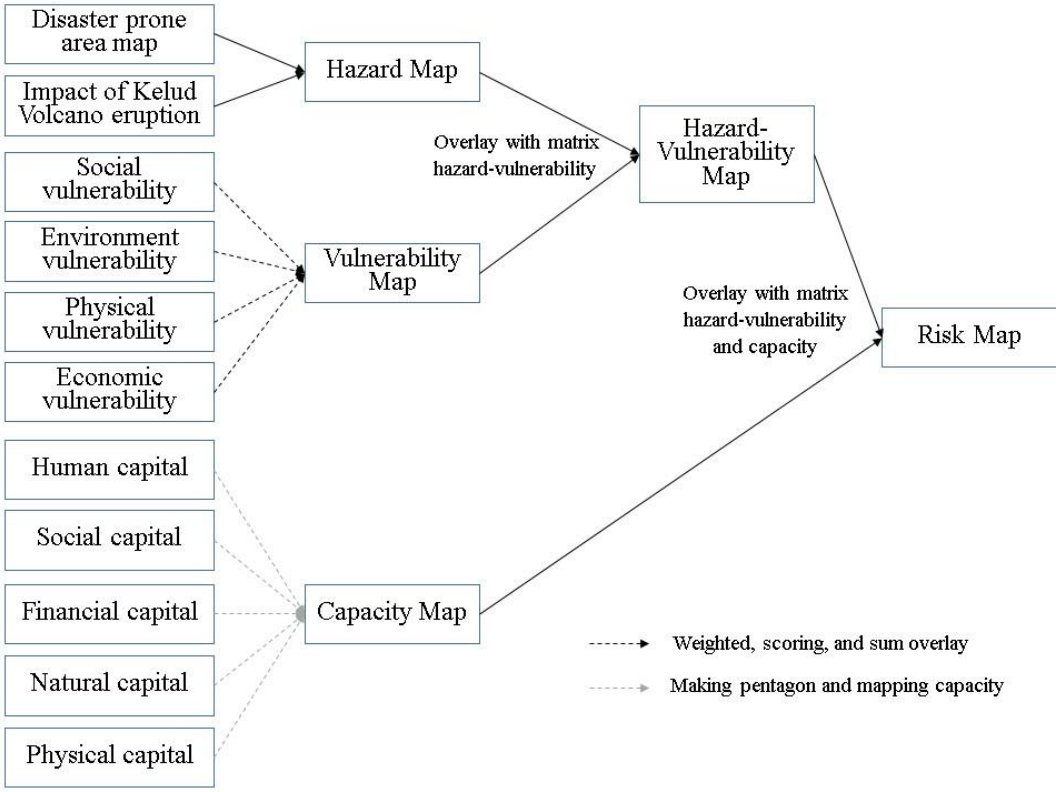

Fig 1. Process to establish disaster risk map of Mount Kelud eruption in Kasembon District

Table 1. Hazard-Vulnerability Matrix [6]

Vulnerability \ Hazard	High	Moderate	Low
Low	Moderate	Low	Low
Moderate	High	Moderate	Low
High	High	High	Moderate

Table 2. Risk Matrix [6]

Capacity \ Hazard-vulnerability	High	Moderate	Low
High	**Moderate**	**Low**	**Low**
Moderate	**High**	**Moderate**	**Low**

3. Results

Hazard analysis is done by overlaying disaster prone area maps from PVMBG [4] and **i**mpact of disasters area maps from PVMBG. Impact of Kelud Volcano eruption combine with interviews with local authorities and BPBD Malang Regency. Result of hazard map is Kasembon District dominated by low-hazard areas with area 6519.31 ha, and moderate-hazard at Pondok Agung Village with area of 11.72 ha.

The level of vulnerability is obtained through the process of scoring each parameter of the physical, social, economic and environment vulnerability then the fourth map of vulnerabilities overlayed with methods sum overlay on the menu ArcToolbox ArcMap 10.2. According to the Figure 2 obtained high vulnerability is in Pondok Agung village, Pait Village and Bayem Village. The condition is due to land in Pondok Agung village dominated with forest lands that can damage caused by the eruption of Mount Kelud, also residents in the village of Pondok Agung has a low level of education. Unlike the Pondok Agung Village, Bayem Village vulnerability is high because the amount of shrubs land that can easy to get fires when the eruption of Mount Kelud also Bayem Village has high levels of poverty. For Pait Village high vulnerability caused by Pait Village has high vulnerable age composition of the population, low levels of education and high number of people who work in the agricultural and livestock sector.

Capacity assessment done by calculating the level of ownership of social capital, human capital, natural capital, physical capital and financial capital of each village in Kasembon district. After know the level of capital ownership, then capital ownership is illustrated in the diagram pentagon [1] [3] [5]. The village which having high capacity is Wonoagung Village. High capacity of Wonoagung village derived from high ownership of natural capital, physical and financial. The village which having moderate capasity level is Bayem Village and which having low capacity level is Kasembon, Pait and Sukosari Village.

After hazard, vulnerabilities and capacities map well done, then disaster risk analysis can be done Figure 2. Based on the illustration Figure 3 showed that the village have a high risk are Pondokagung Village with an area of 1928.80 ha, while village have moderate risk is Bayem, Kasembon and Sukosari Village, then village which have low risk is Wonoagung Village (Table 3 or Figure 3).

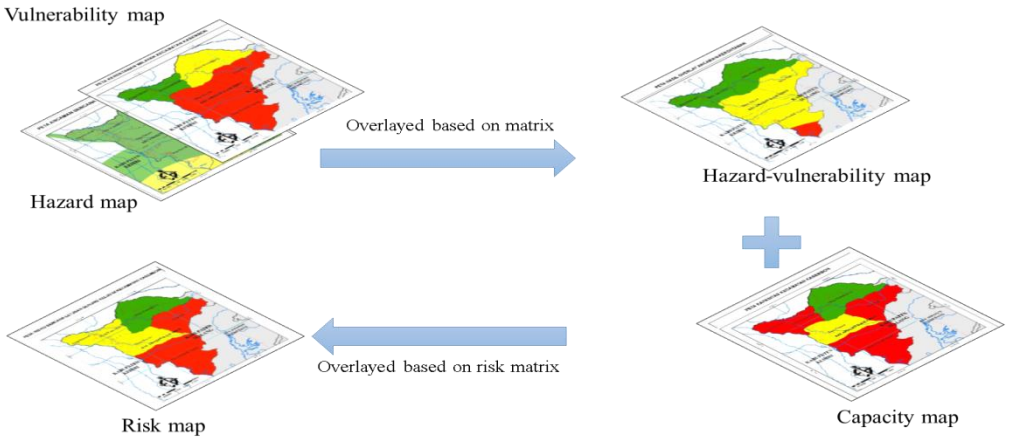

Fig 2. Illustration to Establish Disaster Risk Map of Mount Kelud Eruption in Kasembon District, Malang Regency

Table 3. Disaster Risk Level of Kelud Volcanic Eruption in Kasembon District

Village	Risk Area (ha)		
	Low	Moderate	High
Desa Bayem		1117,97	
Desa Kasembon		459,03	
Desa Pait	1057,71		
Desa Pondokagung			1928,80
Desa Sukosari		485,15	
Desa Wonoagung	1482,38		
Total	2999,12	3208,06	323,85

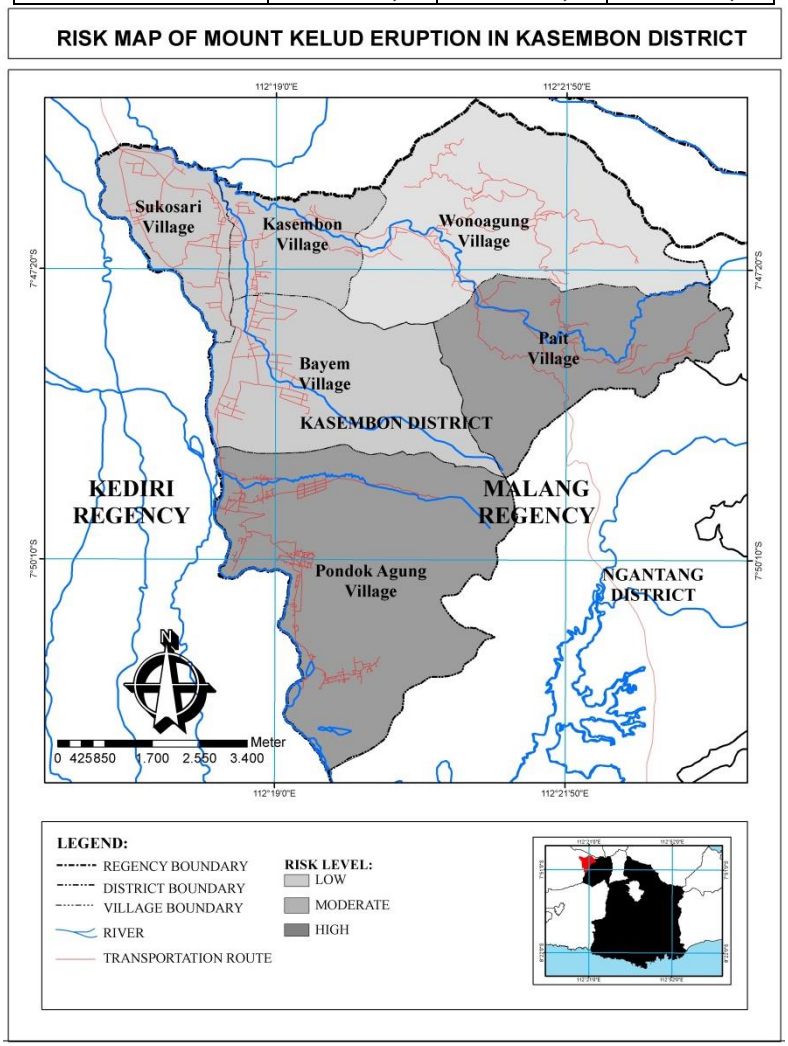

Fig 3. Disaster risk map of Mount Kelud eruption in Kasembon District, Malang Regency

4. Conclusion

Based on the analysis and mapping the risk of Kelud volcanic eruption in Kasembon District, the village that has a high risk is Pondokagung village. Pondokagung village has high risk because they have a higher level of hazard than other villages because it is closest to the center of the eruption of Mount Kelud. Pondokagung village also has a high vulnerability to disasters, especially environmental and social issues. Therefore, to reduce the risk of the eruption of Mount Kelud, village that should be prioritized handle is Pondokagung village through good environmental management and increasing social conditions by increasing the educational level, including disaster training.

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Strategic Planning of SME Sectors Case Study: South Hulu Sungai Regency, South Borneo Province

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Abstract

South Hulu Sungai Regency has a potential of SME (Small and Medium Industries) sectors can be developed as economic development. Based on RTRW South Hulu Sungai Regency, they have 14 SME are propeller, pottery, blacksmith, dried fish, purun webbing, pastries, dodol, crackers, imitation jewelry, woven water hyacinth, bamboo, syrup, brown sugar and saber. There are issues related to SME development that is low quality and quantity of human resources, local raw material, limited capital, low competitiveness, production equipment is still conventional and lack of media for marketing the product. The purpose of this study is to develop the leading sectors of SME to improve the economy and quality of life. The research method is descriptive qualitative, leading sectors analysis and force field analysis. Data were obtained from primary and secondary survey of relevant institutions and interview to the community. Based on leading sectors analysis, there are six leading sector is propeller, blacksmith, dodol, dried fish, pottery and crackers. Based on force field analysis, determined the strategy for using operational excellence's concept, that is the development in industrial sector by minimizing productions cost so SME's product can compete by the price and efficient production process.

Keywords: development strategy, leading sector of SME, force field analysis

1. Introduction

Industry is all forms of economic activity that processes raw materials or take advantage of industry resources to produce goods that have added value or higher benefits, including industrial services. Industrial materials taken directly or indirectly, then processed, thus producing goods worth more to society. All activities related to industrial activities referred to by the industry. Industrial development aims to increase the prosperity and welfare of the community in a fair and equitable to utilize the funds, natural resources and cultivation. The construction industry is also able to increase the ability of economically weak groups, including craftsmen in order to play an active role in the construction industry.

Industry / industry in Indonesia is one important component of economic development. Industry enables the Indonesian economy is booming and is getting better, so bring a change in the structure of the national economy. Industrial development in Indonesia is now taking place very rapidly as the progress of science and technology. Development of industrialization in Indonesia have increased and decreased, both from the agricultural industry, the craft industry, the food industry, the property industry, oil and gas industry and others. One of the challenges facing the national industry is low competitiveness in the international market. Factors that cause the lack of competitiveness among others, the increase in energy costs, the high economic costs, as well as inadequate bureaucratic service. Another challenge faced is still weak linkages between industry (upstream and downstream industries as well as between large industries with small and medium industries), the limited production of intermediate goods and components in the country, the limitations of high-tech industries, the gap economic capacity between regions, as well as dependence on the export of certain commodities. The government's efforts in improving the industry in Indonesia is done in two ways, namely in terms of regulation is done by updating the Law of Industry, which is no longer appropriate to the circumstances, and in terms of bureaucracy do with improving the quality of human resources and facilitate obtaining a business license.

South Borneo is a province located on the island of Borneo, with the capital city of Banjarmasin. Industries in South Borneo is one component of economic growth. Contribution of the industrial sector of micro, small and medium enterprises play a role in creating employment and income distribution in South Borneo. Industrial development of micro, small and medium enterprises have not shown the most because it is still constrained limited capital, raw

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materials, as well as marketing. In addition to industrial micro, small, and medium enterprises, in the province of South Borneo also have Industrial Area Industrial Area which Batulicin, Tanah Bumbu and Jorong Industrial Zone, Tanah Laut. Industrial Area contribution was instrumental in creating equitable economic development, improve the efficiency of logistics systems as well as the main centers of the movement of new growth. Industrial Development Zone has yet to show maximum results because of discrepancies in the policy is still constrained by the central government and local governments in terms of spatial planning and sectoral ministries with each other, overlapping in licensing between sectors and inadequate energy infrastructure.

Hulu Sungai Selatan Regency with strategic location which is in the midst of South Borneo Province so that centered development, and famed as "Banua Lima Center". Hulu Sungai Selatan Regency could be a buffer other districts so that potential is wide open to develop Hulu Sungai Selatan Regency. Based on RTRW Hulu Sungai Selatan explained that the vision of development in Hulu Sungai Selatan is "Towards Hulu Sungai Selatan who agriculture and Religious (agro-industry based agricultural development and religious). The value of GDP Hulu Sungai Selatan showed that the industrial sector is in fourth position after agriculture, trade, hotels and restaurants, and the last is services. Although the industrial sector is not a major sector in the economy increase in Hulu Sungai Selatan but expected the industrial sector can become an important sector, role in the economy of Hulu Sungai Selatan to support value-added agriculture and other sectors.

As one part of the territory of South Borneo, the industrial sector is one of the leading sectors in South Hulu Sungai Regency. South Hulu Sungai Regency have 14 UMKM are propeller, pottery, blacksmith, dried fish, purun webbing, pastries, dodol, crackers, imitation jewelry, woven water hyacinth, bamboo, syrup, brown sugar and saber. industrial in South Hulu Sungai Regency dominated by raw materials from South Hulu Sungai Regency itself it is at the potential to reduce distribution costs of raw materials. The use of materials from South Hulu Sungai Regency aims to maximize existing resources both natural resources and human resources. Maximization of resources agricultural and fishery products intended to provide additional income for farmers and fishermen. The paper would explain about how to develop the leading sectors of SME based on the strategic planning in South Hulu Sungai Regency, and the target is creating a performance improvement strategy SME sector in South Hulu Sungai Regency in increased economic growth of local, regional, and national.

2. Methods

In order to collect the data, we do the primary and secondary survey. Primary survey we use the questionnaire to interview the owners of the potential industries in South Hulu Sungai Regency and for the secondary survey is being used to collect data from the institutions related to the industry. The questionnaire consists of several questions that are prepared by the researchers related to the industrial activities.

The research itself uses three analysis to answer the problems that divided into three kind of analysis. The first is descriptive analysis that includes identification of SME sector, linkage system analysis and subsystem analysis. Evaluative analysis, for leading sector analysis. The last one is development analysis that is force field analysis.

3. Results

Activity in the SME (Small and Medium Industries) sector South Hulu Sungai Regency consists of SME food and beverages, handicrafts and IKM metals, machinery and equipment [1]. The data obtained from the survey of primary and secondary surveys to agencies that are directly related to the management of the industry in South Hulu Sungai Regency. In this study the industry developed is the leading industry. Determination of the seed industry is done by using scoring analysis, in order to obtain the six leading industries, namely propeller, blacksmith, dodol, dried fish, pottery and crackers.

Fig. 1. The Six Leading Industries

Force Field Analysis [2] [3] is based on six industry in South Hulu Sungai Regency is obtained each of the four key factors of the driving factors and factors hampered. A key factor as follows.

Table 1. Key Factor of Driving Factor and Inhibiting Factor

Driving factors	Inhibiting factors
Raw materials from South Hulu Sungai Regency	Limited capital
Workforce of South Hulu Sungai Regency	The means of production is still traditional
Outbound marketing South Hulu Sungai Regency	Not yet have a product name
Their excellent product quality	Human resource lack the skills and expertise

The concept of the development of the industrial sector in South Hulu Sungai Regency based on force field analysis, so we get a value proposition that is the direction of the development of operational excellence. Operational Excellencce means products and services based on competitive pricing, to minimize the price through benchmarks of efficiency, organization and industry are multifunctional, as well as the advancement of the industry and organizations through the prices that the process is efficient and easy. Thus, the industrial sector products South Hulu Sungai Regency is expected to have a competitive edge in terms of product quality and price.

Operational embodiment excellence done through linkage system development plan, the plan sector linkages, industry product marketing plans to the management plan industry. Operationalization of the concept is carried out with strategies in accordance with their respective development plans. Strategy linkage system development plan includes an increase in the working system from input to output process with good management and structured. Strategy development plans linkage sectors include improving cooperation with the sector Agropolitan and minapolitan in the supply of raw materials, the development center for new industrial processing sector Agropolitan and minapolitan, utilization of local tourism as a marketing medium, the active promotion facilitated by the government or the private sector, an increase in media campaign to support network expansion. Strategy development plans include the active promotion of industry marketing, facilitated by the government or the private sector, an increase in media campaign to support the network expansion of the market, the use of e-commerce to support the expansion of the network market. Strategy development plan processing industry include increased productivity products through the development and utilization of technology, productivity improvement products through training in processing and packaging of industrial products, increase productivity through the capital increase with the cooperation of government and private sector, improving the competitiveness of industrial products, industrial waste processing with the 3R concept (reuse, Reduce, Recycle), increased use of local resources effectively efficient professional. Then supported with advice and infrastructure plan include, the marketing of products closer to the node movement (docks, airports and seaports), optimization of transport facilities and infrastructure to support the distribution of industrial activities.

4. Conclusion

Based on the leading sector analysis an, the SME sector that has to be develop is propeller, blacksmith, dodol, dried fish, pottery and crackers. Therefore, to develop those leading sector of SME we can use operational excellence concept for strategic planning. Operationalization of the concept is carried out with strategies that increase the productivity of the products through the development and utilization of technology, productivity improvement products through training in processing and packaging of industrial products, improved productivity through increased working capital with the cooperation of government and private sector, improving the competitiveness of industrial products so that they can add to the market , reprocessing of waste industrial products with the concept of 3R (Reuse, Reduce, Recycle), increased use of local resources effectively an efficient, professional, increased cooperation with the sector agropolitan and minapolitan in the supply of raw materials, the development center for new industrial processing sector agropolitan and minapolitan, utilizing local tourism South Hulu Sungai Regency for marketing, promotional activities actively facilitated by the government or the private sector, an increase in media campaign to support the network expansion of the market, utilizing the media promotion of e-commerce to support the network expansion of the market, the marketing of products closer to the node movement (dock, airports and seaports), optimization of transport facilities and infrastructure to support the distribution of industrial activities

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Bali as Ecotourism Destination: Alternative Strategy in Marketing of Tourism Destination

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Abstract

A tourism destination is not only selling a single product but offer many options as an alternative to win the competition. Bali is one example of the tourism destination that offers many choices of products, namely cultural attraction, ecological atmosphere, spiritual, and sports tourism activities. This study aims to explore the potential of ecological tours in Bali, perceptions of foreign tourist to the ecological tourism activities the role of foreign tourists and travel agencies in marketing ecological tours. Two tourist attraction that becomes the preference of ecological tourists visiting Bali is the Mangrove Information Centre and Bali Barat National Park. Both of them have unique and different markets. Mangrove information center enthused by tourists while the West Bali National Park more preferred by foreign tourists. Both are marketed by Travel Agencies in Bali.

Keywords:Ecotourism, Bali, alternative, strategy, marketing, tourism, destination ;

1. Introduction

Tourism destinations is an important component of the tourism system. Tourism destination is described as a place and image. In most of the tourist destinations of tourist activities carried out since set foot in the airport, heading for places to stay, places to eat and drink, visiting tourist attractions, shopping and meeting with friends and the community to leave tourism destination. Thus it can be imagined how to complex the problems experienced by travelers and hosts. Tourism destination is also described as a product where every traveler can enjoy a variety of tourism potential tourism destinations ranging from tourist attractions, facilities, infrastructure, transportation, and hospitality.

Some tourist destination is one of the elements of tourism destinations which can form the image of a tourism destination. As an example of Singapore is an attraction which is unique because of its infrastructure and transportation facilities. Tourists visiting Singapore for reasons of infrastructure and transportation facilities. But really a tourist destination should have all the constituent elements of the tourism destination which is often referred to AFITH [1].

Ecotourism is part of a segment of the overall market. This market segment demand by tourists from Europe [2]. Ecological tourism product is part of the kind of cultural tourism and nature. So that kind of travel can be a combination of natural and cultural tourism activities but still has the hallmark of design other tourist attraction, namely the significance of conservation, education, and recreation. Tourism products also place emphasis on efforts to empower communities [2]. Ecotourism ecology also associated with marketing efforts mainly targeting a specific market segment or niche market. Tourism product is a kind of tourist attraction which includes the effort to not harm the environment [3].

Ecological tourism is one of the attractions of interest to foreign and domestic tourists. In the context of the world, this type of tourism to the attention of the United Nations with the establishment of UNEP or the United Nations Environment Program escorting ecology-based tourism development in the world [5].With the enactment in 2002 as the year of ecotourism demonstrates how important this type of tourism is developed. It can not be denied that this type of tourism is born as a protest against the concept of the development of mass tourism.

For further indicates the importance of ecotourism, can be seen from the many research-related ecotourism in various parts of the world, whether in Europe, Asia, including in Indonesia [5],[6], [11],[10],[9]. Almost every country

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has developed this kind of tourism because it is expected to improve the economy of the community while still preserving the value of the social, cultural and environmental. [9] for example, a guidebook for developing ecological tourism by creating a master plan 2013-2020. With ecotourism master plan made this country expects to attract local tourists to visit more. Besides, the Queensland government is also expecting their activities to educate the public, as instructed in the concept of ecotourism, which is to increase awareness in preserving social and cultural values, environmental and community empowerment to boost the economy.

Bali as a world tourism destination has the potential variation, which spread almost throughout the counties and cities in Bali. Of the 113 appeal in Bali, some of which are natural attractions in addition to cultural tourism and the combination of the two. Natural tourist attraction in Bali can generally be described as a tourist attraction beaches, villages and mountains. Type of beach tourism is a type of tourism that is most visited by tourists in general. Kuta beach for example is a major tourist attraction sexiest compared with the same tourist attraction like Sanur, Nusa Dua and Tanah Lot.

Natural attractions, one of which is a kind of ecological tourism besides agro tourism. Kind of ecological tourism in Bali, including the conservation of various species of plants or wildlife reserve one of the largest in Bali Botanical Gardens Bedugul. The other is that conserve various species of plants and animals called wildlife refuges include monkey forest and wood land birds. Forest with bird conservation is the famous West Bali National Park is located in Buleleng regency. Type ecotourism also conserve plants and animals are Kedaton in Tabanan, Pala Forest Sangeh in Badung regency, and Monkey Forest in Ubud, Gianyar.

West Bali National Park or TNBB is a kind of tourist attraction that many tourists who want to find a natural experience. Branding of TNBB is due to breed birds are endangered Bali starlings. TNBB as a national park in Indonesia has limited travel activity in accordance with location status as a national park. This area also offers environmentally friendly accommodation and activities are always associated with preservation of function [5]. In addition to the existing district TNBB Buleleng. Bali also has the potential of ecotourism that is in the city of Denpasar, the Bali Mangrove Forest Management Area I, better known as the Mangrove Information Centre is located in By Pass Nusa Dua.

2. Methods

This study was a qualitative research combined with quantitative research. Application design of qualitative research conducted by conducting focus group discussions to determine 1) the potential of ecotourism ecology in Bali, 2) whether the agency travel agency sells this package when Bali is cultural tourism, 3) the origin of tourists who enjoy ecological tourism, and 4) the types of activities carried out ecological tourists in Bali. Application design quantitative research conducted by questionnaire to travelers to determine the effect of variable ecotourism on satisfaction and intention to behave tourists in Bali. This study will also compare the behavior of foreign and domestic travelers for eco-tourism experience in Bali. The samples used in this study were 100 samples consisting of 35 foreign tourists and 65 tourists. Questionnaires were administered to travelers on two ecological tourist attraction that is in the Mangrove Information Centre and in the West Bali National Park. Analysis of data using simple regression analysis [4].

3. Results

Based on the results of research on online media presented on the internet as well as examined articles published on the Internet a few attractions including ecology-based tourism attraction Pala forest better known as the Forest Sangeh, located in Badung regency. Kedaton monkey forest pedestal known as Alas Kedaton is located in Massy village, Tabanan, other ecological tourist attraction is the jungle ape known as the Monkey Forest, Ubud, Gianyar. Other large ecological region is the Botanical Garden in Bedugul, Tabanan and Bali Barat National Park that conserve Curik Bali or Bali Starling. However, this study only examined the ecological region Mangrove Region I, located in Denpasar, Bali, exactly in the way by Pass Ngurah Rai Bali Barat National Park (TNBB) place that became a breeding center Bali starling bird, the wild life in the jungle.

3.1 Definition and ecotourism development approach

The ecotourism society (TIES) defines ecotourism as responsible travel to natural conserve environmental sustainability and well-being of local communities (TIES, 1991 in [2]. Meanwhile, according to the World Conservation Union [2] ecotourism is environmentally responsible travel and visitation to are relatively undisturbed nature areas, in order to enjoy and appreciate nature (and any accompanying cultural futures-both past and present)

that promotes conservation, has low negative visitor impact, and provides for beneficially active socio-economic involvement of local population [2].

As a concept, ecotourism is a component of sustainable tourism which is used as a tourist attraction by different types of tourists both aiming for leisure, business, and visiting family. Sustainable tourism produces the kind of tourism called ecotourism, nature tourism, cultural tourism, rural tourism and beach tourism as well as business tourism, better known as MICE tourism [2].

3.2 Ecotourism as market segment

Ecotourism according to [2] previously just something small but in the past has developed very rapidly not only in Indonesia but also in the world. In the context of the world and Asia, including ecotourism-related research carried out by the [11],[2],[9],[6],[7],[4]. [14] conducted a study in Costa Rica that examines the role or the benefits of ecotourism in the context of environmental, economic and social impacts. Further stated that the development of ecotourism more provides economic and environmental benefits, but there is still a negative impact in the social context, one of which is the problem of prostitution and liquor. Ecotourism is a niche market of all existing market share both foreign markets and the archipelago. Both of these markets have the same opportunities to be a potential market and generate benefits for the company, the community, and the environment. In Indonesia is itself a related study conducted among ecotourism [8],[11]. Research conducted at the Alas Purwo National Park (APNP) illustrated that for sustainable development of ecotourism is not just taking care of the product or offer (nature, culture, and the environment), but also the aspect of demand or demand mainly tourist satisfaction.

3.3 The role of travel agency

The Role of Travel Bureau, the role of Travel Bureau in this case is: 1) in accordance with its function liaison between tourists with tourism facilities such as the hotel, attraction and transportation, then can be explained that nearly 70 percent of travelers to get and using information from BPW BPW tourist trip to enjoy the experience. Although many tourists allegedly not currently use BPW in line with the development of Internet-based information technology fast-paced and quality. But it was not entirely true because travelers are still using BPW advanced age and origin of the country by travelers from Asia prefer using BPW. This phenomenon is certainly very interesting to be studied more in depth, with regard to demography travelers.

3.4 Tourists cctivities in the area of ecotourism

The activities of tourists when visiting the tourist attraction ecology include 1) enjoy the forest environment in the form of sightseeing whether done in Bali Mangrove Management Region I and in the West Bali National Park (TNBB). 2) do the planting and seedling production activities mainly in Bali Mangrove Region I. Activity circumference mature mangrove forest was introduced to visitors. In addition, before touring to the mangrove forests. Participants will be given a briefing by the officer's attention to the problems of mangrove conservation, cleanliness and maintain plants and another habitat is in the forests of mangrove, such as crabs, lizards, and birds. Mangrove forests also offer a product for bird watching.

3.5 Status of ecotourism

West Bali National Park (TNBB) has an area of approximately 19 000 hectares today has done research on its role as a model for the implementation of standards in forest carbon credits unified, because TNBB considered able to maintain biological diversity and is unique because as a breeding bird of “Curik Bali or often known as starlings Bali. According to Director General of Forest Protection and Nature Conservation. TNBB forestry ministry explained that until now have only 32 of starling Bali and bred in captivity only able to add as many as 106 birds [13].

Region TNBB zoning, include: 1) the core area with a total area of approximately 8 thousand hectares, 2) area of jungle with an area of 6 thousand more, 3) a region or marine zone with an area of 221 hectares, while other areas 4) utilization area of 4 thousand hectares more), 5) cultural area, relegion and history as much as 50 thousand hectares and 3.9 hectares as a special area and traditional neighborhood 310 hectares. In accordance with the principles of ecotourism, TNBB region serves as 1) for the use of economic, research, support aquaculture, tourism, and recreation [13].

3.6 Comparison of ecotourism management model

Both types of ecotourism Bali Barat National Park and the Central Management Area I mangrove forest is under the management of the government, namely of Ministry of the Forestry Republic of Indonesia. Both are forests for conservation but have differences in the types of conservation. TNBB is to conserve the existence starling Bali is at present only a wild-free as much as 32 only. So that its management is an icon Bali starlings. Icons for Mangrove Forest Management Area I is the mangrove forest as icons. Although these two sites are managed by the government, both involve the community in its management, in accordance with the zoning or designation of a predetermined area. So that more economic benefits obtained by the public, but the benefits of conservation can be enjoyed by the government and communities. The existence of three tourism companies in TNBB shows how important ecotourism marketing strategy that involves the public, government and private.

3.7 Marketing strategy ecotourism area

Each component of tourism cannot escape the role of marketing as an important part of the tourism system. Marketing becomes a bridge linking between the rating of the service providers exist in tourism destinations. Marketing is to communicate and provide information to the tourist or by the service provider. The service provider must undertake activities to bring in tourists. Not up there, the desire to gain economic benefits by all tourism service providers will be in vain, if tourists do not get satisfaction on the quality of service provided by the service provider. Advanced strategy post-satisfaction rating is the strategy of building customer loyalty. Tourists who wish only to come once should be motivated to want to revisit and give a positive recommendation to family and or others. Service providers must ensure that their loyal customers willing to come back and give recommendations to others, Either by asking directly or by questionnaire or a focus group discussion activities with tourism actors.
Strategies that can be done to market these two sites are marketing in general and marketing in particular. In general marketing ecotourism area are using the internet and in cooperation with Travel Bureau. In particular, this area must build an image by placing a unique potential possessed. TNBB with bird theme is birds "Curik Bali" or "Bali starlings". As for the Hall of Mangrove Forest Management Area I is the market "Mangrove forests" as the main attraction.

4. Conclusion

West Bali National Park (TNBB) previously called the wildlife reserve area after the New Order era referred to the national park. TNBB a wealth controlled by the state which form of land containing natural resources dominated by trees in their natural environment is one that can not be separated in accordance with Ministry of Finance Regulation No. 98 the year 2010 [2].
Ecotourism is a type of tourism that is today developed in various parts of the world. Ecotourism is an implementation of the concept of sustainable tourism development. Ecotourism is sustainable development that conserves nature, educate visitors about sustainability and benefits for society [2]. Further stated that ecotourism is part of the tourism industry because it can increase people's income but can be more sustainable biodiversity and sustainable use.
[2] asserts that the existence of ecotourism is not just a rating or experience to tourists but also to benefit the ecological sustainability and benefits to the community. Many examples of ecotourism practices in various parts of the world. Various tourist attraction ecology offered to tourists among tourists enjoy tea house in Nepal, saw the bird in the Philippines, enjoy the natural scenery Mount Kalimanjaro in Kenya.

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Scaling Up Social Capital: A Model Of Rural Community Empowerment

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Abstract

Indonesian government has delivered various community development programs to aleviate poverty problems of rural communities. This is despite the fact that the numbers of people who live in poverty in this area is going to increase. This has given rise to a crucial question in how development programs should be distributed to rural community members. This article present empirical findings of research depicts a model or mechanism by which rural community members who have been involved in Posdaya program success in achieving economic empowerment objective by employing their social capital. The result of this study found that this model has required a high level of community members' participation in conducting development programs. However, this study found that another Posdaya has employed different mechanism to undertake its programs which has impacted on the lack of its social capital. This different mechanism has hindered the implementation of scaling up social capital model.

Keywords: community development; social capital; empowerment; rural community.

1. Introduction

Indonesian government has established various community development programs with main objective to address poverty in rural areas. However, current data shows that the numbers of people who live in poverty in this areas has increased from 17,37 million people on September 2014 to 17,94 million on March 2015. This number shows that community development programs have not yet delivered maximum benefit to rural communities. Some scholars identify several factors for causing this issue including (1) the top-down approach to undertake development programs; (2) the ignorance of local values and dominance of outsiders; (3) the lack of rural community members participation; and (4) the loss of social capital of rural communities (Hadi, 2007; Hasbullah, 2006). For instance, local elite in rural areas tend to prioritize their families, groups and self-interest to get benefit from government development programs instead of focus on a main issue to deliver these programs effectively to poverty people in rural areas.

Putnam explain social capital as social relations which are conducted based on trust, noms dan social networks [2]. Several research studies show that social capital has positively contributed to achievement of democracy and wealth of society [3], [4]. Futhemore, Isham found that community members in Tanzania who develop strong social capital are easier to adopt new technology to cultivate their land compare to others who have less. In Indonesia, several studies depict social capital as an independent variable which has determined whether or not community developmen programs would deliver benefit to communities [1][5][6][9]. However, all these research studies were conducted at local level, particularly in rural areas or community level. This study aims to find a model or mecahnism they way in which social capital can be scaling up to higher level to support the implementation of community development programs.

2. Methods

To illustrate the model or mechanism by which social capital could be scaled up to higher level, a multiple case studies was implemented by involving two Posdaya which are located on different villages, Ngroto and Pandesari

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Villages. These two Posdaya have been included in order to make comparation in regard to the model which has been established to build their social capital through community development programs. Case study approach was employed as it contributes to get understanding or knowledge from individu, group, organization (Posdaya) and social phenomenon [10].

Data were collected by employing semi-structured interviews, review of documents, and observation. All supporting data (i.e. research studies related to social capital and community development programs issues; Posdaya's documents such as organization structure and document activities) were examined. Observation was also utilized to capture social and economic condition of Posdaya's members, such as their house, land, and productive activities.

Fifteen informants from two Posdaya who were selected based on their involvements in Posdaya programs. These informants were assumed will share their information and knowledge in relation to social capital which is built through Posdaya's community development programs.

3. Results

Result of this study shows that the establishment of Posdaya, particularly in Ngroto Village has succeeded to enhance social capital which further has influenced the implementation of its community development programs. Posdaya of Ngroto Village has employed a bottom-up approach which requires participation of its members in conducting their programs. The members of Posdaya have been grouped based on their interest, such as the same of hobbies, talent and profession. This has impacted on the increasing of their family incomes. In contrast, Posdaya of Pandesari Village has employed top-down approach by grouping its members based on the location (same neighbourhood).

The development of social capital which is regarded as best practice in this research is the development model of Posdaya group in Ngroto village. The group adheres to a bottom-up perspective that emphasizes people's participation and aspiration as a means of empowerment. The development of Posdaya in every village is ideally done by the community through forming the groups according to common interests. These similarities become a strong social capital and appear in the bounding when they build solidarity among group members through shared learning. In addition, there are also bridging social capital, especially when they start to communicate with other groups to form a wider network. Through the model of bonding and bridging, there appears to be elements of soacial capital, namely networks, trust and norms among the groups. Thus, it has become the basis for sustainable Posdaya empowerment. If such a model can be realized in every village, the aforementioned empowerment model can be in scaled up to a higher level, that is district.

The development of social capital that is considered to be successful in this research is the development model adopted from one of the groups of Posdaya in Ngroto village. The group carries out a bottom-up perspective with the emphasis on the participation and aspirations of the people as a means of empowerment. The development of Posdaya in each village should be done by the community through the formation of groups that share similar interests. By doing so, the Posdaya will certainly build a strong social potential since each activity will be carried out enthusiastically. The strength of this social capital can be determined by the relationship the people establish through bounding acts, like creating solidarity among group members through learning together, sharing any information to groups that will strengthen the bound. Another attempt to maintain the social capital is performed in a way that the people build an interaction between one group with the other ones or with the customers so that it will allow a wider network of group empowerment. Bridging and bounding mode of social capitals are derived from the elements of network, sense of trust and norms among the groups. So, the above-mentioned social capitals can maintain the power of social capital and finally can take place on an ongoing basis.

4. Conclusion

According to the previous comprehensive explanations, it can be inferred that the the development model of scaling up in the context of this research can be done through empowerment of similar interests. As a consequence, mutual relationship will be performed by means of a variety of coordination and cooperation. It is expected that the social capital will remain stronger by doing so. Automatically, the social capitals such as information sources, networks, trust, norms, expectations, and sanctions among Posdaya group will remain effective. That way, the members can develop their own Posdaya well. If the strategy is successful, the empowerment model will be replicated to a higher level, that is the district.

The empowerment of Posdaya needs to consider the potential, interest, and communal purpose in that particular group. The empowerment of Posdaya in Ngroto village can be the best example for any other group members of

Posdaya. The empowerment is based on the commonality of interest that is in fact managed to be maintained by the members with or without the influence of outside parties that stimulate empowerment in the group.

Scaling up empowerment models need to synergize with each model of Posdaya located at the village level. If the model of empowerment at the village level does not refer to the similarities that are able to bind the members together, the empowerment model that is suitable to implement is the top-down pattern, and not the bottom-up one.

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Disaster Mitigation Action Plan: Digital Media on Improving Accountability and Mending Community Relationships

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Abstract

This study wants to address on how, Communication Science applied to Disaster Mitigation Plan. As we know Indonesia is located on the cluster of active volcanoes, is also in the position of the islands of the archipelago, though the study on Digital Mitigation Plan is still lacking in Indonesia. It is inversely proportional to cases that occurred in Indonesia. The development of communication technology and social media research is now also supports the establishment of community media with a broader impact. Using (PAR) Action Research, this study based on how the Government -Local Community and Media Using implemented on how society Mitigate Disaster in Tulungagung Coastal Areas. Various levels of priorities that include disaster mitigation information, namely, that an increase in chain system of early warning systems, building evacuation, improved preparedness and capacity facing a disaster, and disaster risk reduction factor. Through the concept of the expected mitigation actions Tulungagung Coastal areas can be applied in various regions in Indonesia by BNBP accordance with the characteristics of the region so that the risk reduction process can run optimally. The results of this research is aiming PRBBK (Pengurangan risiko bencana berbasis komunitas). Community-based disaster risk reduction (PRBBK) is the efforts made by members of the public in an organized before, during, and after the disaster by using the resources they have as much as possible to prevent, reduce, avoid and recover from the impact of disasters

1. *Keywords:* digital mitigation plan; tulungaggung coastal areas; local community

1. Introduction

In the discussion of the National Medium Term Development Plan (RPJMN) 2010-2014, the disaster management program become a government priority, given that Indonesia is a country prone to disaster. This statement is also supported by data from the United Nations International Strategy for Disaster Reduction (UNISDR, 2010), that Indonesia was ranked 12th out of 35 countries with the world's highest mortality risk threat hazard. Based on data from BNPB (2011), that Indonesia was ranked first for tsunamis and landslides with the highest number of casualty's world. Catastrophic events cannot be separated from the geographic, geological and demographic Indonesia. Geographically, Indonesia is located on the equator, so the drought and forest fires due to droughts can occur, geologically Indonesia.

The form of communication to deal with the real catastrophe is not something new in the area of Indonesia. In Intense mitigation are making use of mass communication medium such as television, radio, newspapers, and magazines to deliver the news. Television specials, the user intended coverage to residents in the interior due to high penetration of this broadcast media. However, the effort was not without problems. Many distorted media coverage. Distortions it had even been claimed. In Sinabung, residents testified that the news media were impressive mountain situation has eased make people dare to enter the villages in the red zone. As a result, a number of people died as a cloud of heat swept the region on February 1, 2014. The failure of communication in emergency situations takes many forms. Some of the frequent rejection of people to be evacuated, confusing information, news errors, delays the delivery of information, to the failure of outreach. In all this failure, people become victims. Society as the recipient of the information cannot be mistaken. When communication fails, the fault is entirely communicators and to a certain extent, in the medium, because they are the process of formulation and delivery of messages is determined. Messages that fail to be delivered during an emergency is a reflection of the failure to communicate risk reduction in pre disaster. In this case, the successful rescue of humans is determined by the success of communication. Communication is not

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always in the form of verbal communication, but as far as communication allows humans to take the necessary action to rescue

Haddow (2008: 49) explains the importance of involving the media both conventional and new media in the process of crisis management. It refers to the great revolution of the mass media created a new media including computer, telephone and communications network, the Internet, and multimedia technologies (Mahmoud and Auter, 2009). Internet became the medium of computer mediated communication (CMC) with interactivity as superiority. Research suggests that people use the internet when searching for information on the crisis events (Spence et al 2006 in Westerman, 2013: 172). Social media is part of the Internet that gives everyone the power to inform his ideas to others both in interpersonal and massive. However, there is a problem that is about who should be trusted and how to filter information that is useful to the reader (Villanueva on Winkelmann, 2012: 155).

Given the use of social media are contradictory in the crisis and the importance of helping the government (BNPB and BPBD) as the pivot of the disaster information to clarify the flow of information to public communication through social media, the researchers wanted to see the communication network of the tweets of Twitter users about the hoax or rumor eruption of Kelud February 13 2014. the widely used network analysis to understand the phenomenon of the virtual world, one of which Woo-young and Park (2012), which saw public preferences on national issues in Korea in the network structure of the blog. The communications network is found includes sizes (size), density (density), reciprocity and centrality (centrality).

Based Disaster Mitigation Network Communication and Communication technology, has actually been initiated by JalinMerapi.org and Anchors Kelud, Social Movements is based on the local community managed to rescue at the time of the disaster, also while still running the principle of accountability in the distribution of disaster relief. Referring to the RIK seminar organized by the National BNPB, that Indonesia is in need of disaster mitigation Mitigation for Cultural, which means that not only focuses on the construction and rehabilitation of infrastructure but also means reducing disaster risk by taking into account the cultural aspects. This is important, because culturally-based disaster mitigation requires the participation of the local community or local community groups aware of Natural Disasters.

Sidem hamlet, a hamlet located in the southern sea area through which the tsunami plate. Located in Tulungagung with abundant marine potential, makes Hamlet Sidem be potential to develop. In 2006 ago has happened Tsunami in Tulungagung area that includes Turkish, Turkish Popoh, Coastal and Beach Sine Sidem. BNPB itself has done disaster mitigation training regularly every year to cope with the tsunami disaster, and educate the public to always be aware of this disaster. One cause of the many victims of the disaster is a disaster events are difficult to predict, if the early symptoms of a disaster will be known, it can help people to be on the alert and avoidance. Therefore, efforts to develop the ability of people to recognize threats, reduce vulnerabilities and theability to deal with threats. Disaster management is the responsibility of all parties, not least the community, because the community is the first to directly deal with the threats and disasters. Therefore, the readiness of the community determines the size of the impact of disasters on communities.

Community-based disaster risk reduction (PRBBK) is the efforts made by members of the public in an organized before, during, and after the disaster by using the resources they have as much as possible to prevent, reduce, avoid and recover from the impact of disasters. Given the importance of this program, the entire territory of Indonesia is prone to disasters must implement a program of community-based disaster risk reduction. But regional autonomy be a challenge when PRBBK imaginable simply based administrative villages, where the cost of the investment project-based procurement PRBBK only and are not integrated into development planning strategy. This is a new problem in the application of PRBBK in Indonesia.

2. Methods

The focus of research by Moleong (2004: 94) has two purposes: 1) to restrict the study, and 2) to meet the criteria of entry a new information obtained in the field. Thus, through the focus of research is what data should be collected. Here the focus in this study:

1. How Disaster mitigation in the village Sidem
2. Community media appropriate for disaster mitigation both based communication technology or group of people. To achieve the objectives, the type of research is Action Research.

Type Action Research used in this study is participatory action research. According Gonsalves et al (in Muhammad Iqbal, Edi Basuno and Degree Satya Budhi, 2007: 75) explains that, Participatory action research is a combination of research to the action (action) is done in a participatory manner in order to improve aspects of life aspects of community life. In connection *with the integration and participation among researchers, object studied stakeholders (stakeholders), and other elements of society is an element that cannot be separated.

In its application, Kurt Lewin (in Pickard, 2007: 133-138), which is the pioneer of the use of the term action research suggests step "step spiral" (cyclic) consisting of identifier issues (identifying problems), the action plan

(action planning), implementation of the plan action (implementation), evaluation (evaluation) and reflection (reflection). The next step spiral Lewin in the explanation given by Edi Basuno et al (2008: 5) consists of a circle of planning, execution, and the discovery of the facts for the purposes of the final evaluation of the second step; and preparing the premises for the third step, it may also modify the overall plan. In participatory action research, the key principle of the research is as follows (Stinson, 1979 Edi Basuno et al., 2008: 9-10):

a. The community should be involved in the whole process, from the formulation of the problem to the discussion on how to seek resolution of problems and interpret the findings.
b. The research team should be a combination of all the elements that make a difference.
c. The research process should be seen as part of the educational experience that seeks to build community needs and increase public awareness and community commitment.
d. The process should be viewed as a dialectical process, the dialogue all the time and not in the form of a static picture of a single point in time.
e. The object must be the liberation of human creative potential and mobilization of human resources for solving social problems.

In the participatory action research, research activities are very different from the usual action research. This is because in the implementation of participatory action research, practice research conducted in a more practical, customized knowledge society. Documentation is a very important part, especially as reference material public about the commitment they have agreed among themselves. The interaction between community members and researchers more intense and has a stronger personal relationship. The relationship between the community and researchers is ongoing. Elements of sustainability itself are an indicator of a close relationship. While a close relationship is an indicator of the magnitude of opportunities for development (Edi Basuno et al, (2008: 6).

In this study, a researcher also acts as a facilitator. Researchers facilitate Dusun Sidem community in reviewing and implementing disaster mitigation in the village. Facilitation can be seen as part determines the effectiveness and speed of reaching an agreement in various empowerments programmed. Basically conducted by facilitators with regard to how to facilitate the public in solving and develop their potential independently (Edi Basuno et al, 2008: 13). The potential for disaster in the village Sidem is the potential for a tsunami as Sidem Beach is located in the southern sea area through which the plate Tsunami., Thus requiring mitigation for Hamlet Sidem. Disaster mitigation can be done through either community media communications technology or group of people.

3. Results

Disaster (Disaster) is an event or series of events that threaten and disrupt the lives and livelihoods caused by both natural factors and / or non-natural and human factors that cause human fatalities, environmental damage, loss of property, and the psychological impact. Disaster is uncertain. This means that a disaster could occur and may not occur. In the event, the severity is uncertain. Disasters can impact trivial, but be transformed by the presence of morbid and able to swallow hundreds of thousands of lives. Generally, the cause of the disaster that is divided into two: the consequences of natural (natural disaster) or manmade (man-made disaster). A series of disaster relief efforts include the establishment of development policies that are at risk of the occurrence of disasters, disaster prevention, emergency response and rehab. Description characteristics of a number of disasters that often occur in Indonesia are as follows:

a) Flood
b) Landslides
c) Drought
d) Forest fires and land
e) The wind storm
f) The storm surge / tide
g) Earthquakes
h) Tsunami
i) The eruption of the volcano.

Seeing the danger of the above, it is an understanding of the threat of disaster, including a thorough knowledge of the following matters:

j) How does the danger arise
k) The level of possible disasters as well as how big the scale
l) The mechanism of physical destruction
m) Sector and what activities will be greatly affected by the disaster event
n) The impact of the damage. One of the best efforts is to give knowledge to the public about the various disasters that might occur and the impact / consequences.

As an archipelago, Indonesia has the potential vulnerabilities of the largest natural disasters, the tsunami. Tsunami is a series of long waves caused by shifting plates beneath the sea, or in general is the seaquake. Speed tsunami waves capable of reaching 170 km / h, but when it reached the superficial velocity decreases but its wave height increases. Tsunami may take casualties, damage economic activity, as well as damage to the ecosystem in coastal areas (UNESCO, 2011). In the region of South Tulungagung, especially around the area Sidem Beach, Coastal Popoh, and Sine Beach, Tsunami is one threat that is prone to natural disasters. The tsunami impacted heavily on the community's economy, because the majority of people work as farmers. Damage to the boat, industry sector, residence, and marine ecosystems became the main impact of the natural disaster.

Claude Gilbert thrusting summary concept of disaster (Porfiriev in Quarantelli, 1998: 58) in the three paradigms that. First, the disaster is the result or consequence of an external pressure. Second, as a result of social vulnerability and the third as a result of the uncertainty. This concept is still in tune with Pelanda quoted from the same source that interpret disasters as follows. First, the disaster is the result of social and environmental conditions are bad, the Second, the disaster was the result of the collective pressure of a community, and the third was the difference in the capacity to deal with the damage and the negative repercussions that. Things need to be observed associated with the various definitions of a disaster is a perspective view used in a disaster. Here is one definition of a disaster of Webster's New World Dictionary of the American Language cited by Porfiriev in Quarantelli (1998: 57). "..any Happening that causes great harm or damage; serious or sadden misfortune; calamity. Disaster implies great or sudden misfortune that results in loss of life, property, etc. or that in ruinous to an undertaking; calamity suggests a grave misfortune that brings deep distress or sorrow to an individual or to the people at large. "Dahl's Tolkovi Slovar Zhivogo Velikorusskogo Yazika (Explanatory Dictionary of The Great Russian Living Language):" Misfortune or bedstviye (disaster) is an incident, accident or other harmful occasion the resulting in losses and sorrow. Disaster is more related to the known cases of crop failure, epidemics, storms, flodds, To suffer means being a disastrous disaster or dangerous situation; badly needing something; dying. "From these two sources mentioned that the disaster was an event that resulted in damage, death, loss and other adverse effects, including some types of natural events that are considered catastrophic. Another opinion expressed by Maloney and Cappola (2009: 48-49) about the disaster: "Disaster are measured in terms of lives lost, injuries, sustained, property damaged or lost, and environment degradation. Reviews These consequences manifest themselves through direct and indirect means and can be tangible or intangible. "Some social scientists emphasize understanding of the disaster as a social construction. For these experts see the disaster as a result of the process soasial or social consequences that produce hazards, or increase the vulnerability of a social system from the effects of a hazard (Porfiriev in Quarantelli, 1998: 59). Furthermore from the study concept and pragmatic about the disaster Quarantelli try to give defisinya on disasters as follows:

"a state/condition destabilizing the social system that manifest itself in malfunctioning or disruption of connection and communications between its elements or social units (communities, social groups, and individuals), partial or total detruction/demolition, physical and psychological overload suffered by some of these elements; thus, making it necessary to take extraordinary or emergency countermeasures to reestablish stability."

4. Research Plan

Roadmap above the target achievement of the program that will be generated based on cooperation between universities, BPBDs, as well as community groups. Results are expected in the form of disaster response technology-based application that can be applied by the community. Given the important role of technology in the process of disaster mitigation, especially those brought about cultural mitigation. By understanding the mitigation kulural community will be able to become independent people who understand how to address the impact and possibilities of natural disasters of the scope of the individual and the family.

5. Conclusion

Furthermore Carter disastrous split into 5 segments, namely: Prevention, Mitigation, Preparedness, Response and Recovery. At the beginning of the segment, ie prevention (prevention), the focus of attention is on things will be about the importance of prevention, an area that needs attention to do prevention, positive approach through prevention and what resources are needed for prevention. In the segment Mitigation (Mitigation), the action taken is usually a specific program to reduce the impact of disaster on a nation or community. An understanding of the wider implications mitigating the impact of the disaster, however, these impacts can be modified or reduced by appropriate action. Some actions or programs related to mitigation, among others: the regulation of the use of the area, the regulations on the safety of high-rise buildings, control of hazard material, security transport systems for land, sea and air; development system to protect electrical installations and vital communication tool, the development of infrastructure such as the construction of highways that are not adjacent to disaster-prone areas. The third segment is preparedness (Preparedness). In this phase there are some important things you need in an effort early warning, namely: early detection is done impending disaster, early warning process should be done by the party who has the authority thus avoiding unnecessary information, the chain of transmission of effective information, decision-making after their early warning and early warning information dissemination to the public as appropriate. Of the many experiences initial reaction to the disaster mitigation and early warning can save lives and property. In the period of emergency response (response) these aspects of emergencies that need attention in the emergency response phase are:

a) Rescue and relief to the victims.
b) Evacuation of victims across the region.
c) Providing decent temporary shelter.
d) The provision of meals, both distribution and food shortages.
e) The opening of access roads by land air or sea, including a helicopter landing.
f) The availability of means of communication.
g) The availability of clean water.
h) The availability of goods - goods for refugees.
i) Health and sanitation facilities, medical personnel.
j) The availability of public information. The availability of information to the community about what to do.
k) security guarantee for the construction of buildings that earn the highest priority
l) Guarantees for moral support for victims.

Segment recovery, the recovery process can take a long time even could reach between 5-10 years or more. Post-disaster recovery usually involves various aspects such as restoration and reconstruction. In carrying out post-disaster recovery programs are indispensable involvements of various institutions, among others, as the government has the authority in terms of planning and government building of disaster management, including both central and local institutions that provide funding. (Carter, 2008: 240- 288).

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The 3rd International Conference Planning in the Era of Uncertainty:
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Traveller Preparedness in Disaster-Prone Tourist Sites

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Abstract

Kelud is one of the active volcanoes is found in Java East. Kelud is a tourist icon of Kediri and much visited by tourists because of the beauty of the panorama presented. Initially Kelud has three main attraction towing rating, the lava dome or called "Anak Gunung Kelud", thermal baths, and the Ampera Tunnel. However, the appeal was lost when the eruption in 2014. After some time closed to tourists, now Kelud already started the project of reconstruction of tourist sites and has been accessible to the tourist. The purpose of the study is to know the traveler preparedness in disaster-prone locations Kelud travel by using quantitative method with disaster risk analysis. From the analysis, it was found that the level of preparedness travelers who are on Mount Kelud still low and less prepared if there is a subsequent disaster impact.

Keywords: disaster risk; tourist; preparedness; vulnerability

1. Introduction

Indonesia is one of the fire ring country in the world because surrounded by a row of an active volcano, confluence of three active plate zone world such as Eurasian, Indo-Australian and Pacific. Then, the presence of two young mountain path that passes through the Mediterranean and Indonesia are circum-Pacific (BNPB No. 02 of 2012). Active volcanoes and located in East Java including Mount Bromo, Mount Semeru, Mount Ijen, Mount Raung, and Mount Kelud. Mount Kelud, located in District Ngancar, Kediri and last volcanic activity on February 13, 2014 by issuing more than 200 million of volcanic material. Kelud also is probably the best tourist icon of Kediri. Before the eruption, there are three major attraction is the lava dome "Anak Gunung Kelud," hot water bathing, and the Ampera Tunnel. However, after the eruption of 2014, all major tourist attraction Kelud and facilities damaged and infrastructure.

Many studies show that travel in Indonesia include exploiting the potential of the volcano as a location for tourism puller as well as Mount Merapi, Mount Bromo, Mount Semeru and Mount Guntur. Travellers who come are generally keep to see the conditions after the disaster occurred. Based on the number of tourists showed, Mount Kelud still have an attraction for tourists. After the eruption travelers who come to visit are likely to visit locations that show the changes before and after the disaster, as well

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as the visitors were to see the crater of Mount Kelud after the eruption. Now, tourists are likely to see the tourist sites after the eruption of Mount Kelud.

Table 1 The Total Number of Tourism

No.	Tahun	Jumlah	Kenaikan jumlah
1	2013	257.007	25.123
2	2012	231.884	74.341
3	2011	157.543	39.363
4	2010	118.180	

Source : Data Dinas Pariwisata Kabupaten Kediri, 2013

Eruption of Mount Kelud in February 2014 did not affect the number of visitors who come to see the condition of Kelud. The number of visitors on a regular day (weekday)) travel ranges from 100 to 200 , people per day, then for a holiday (weekend) the number of visitors Kelud ranges from 200 to 300 people per day off. It shows that tourist sites Kelud still in demand by visitors although infrastructure has been damaged.

2. Methods

The research objective is to reduce disaster risks faced by travelers at Mount Kelud tourist sites, avoid from the danger of the eruption of Mount Kelud. Data analysis methods used in research related to preparedness tourists in tourist locations Kelud Kediri that disaster risk analysis.

Disaster risk analysis is one of the analytical techniques used to determine the potential affected by the eruption of Mount Kelud in District Ngancar, Kediri. Disaster risk analysis using three variables hazards, vulnerabilities and capacities with the formula as follows

Disaster Risk = threats (H) x (vulnerability (V)) / (capacity (C))

a. The threat level can be determined from a risk map Kelud which is divided into three classifications, namely the threat of KRB I or low, KRB II or medium and KRB III or higher. The map of disaster - prone areas will be known primary and secondary danger when eruption
b. The level of vulnerability of the region, calculation of the level of vulnerability in the tourist resorts of Mount Kelud is divided into physical vulnerability and environmental vulnerability. It is based in a tourist location that there are only two components to support tourism activities..

Analisisi preparedness is used to determine the readiness of tourists in tourist locations. Preparedness rating was obtained by interview and then the result of the calculation of the quest ionnaire, so that know the level of readiness by weight and index preparedness.

3. Results

a. Level of Hazard
   Based on the location of tourist sites kelud mountain located in disaster-prone areas. hazards faced by a visitor that the primary danger during eruption in the form of lava, heat clouds, ash, toxic gases and incandescent rocks. secondary hazards such as landslides and after the eruption of cold lava.
b. Vulnerability's region level
   Next step is to calculate the level of vulnerability of the tourist area of Mount Kelud. Calculated of physical vulnerability and environmental vulnerability, with result calculated as follows:

1. Physical Vulnerability
   Variables considered in the analysis of physical vulnerability that are a percentage of the damage done to public facilities, road networks and power grids. Indicator used to assess the physical vulnerability of tourist facilities, road networks and electricity networks, namely Miladan 2009, with the following indicators:

Table 2 Physical Damage Indicator Tourism Facility

Percentageof damage	Weight	Classification Vulnerability
<10Ha	1	Low
10-20 Ha	2	Medium>
20 Ha	3	High

Source: Miladan 2009

Table 3 Electric Networks Damage Indicators

Percentage of damage	Weight	Classification Vulnerability
<50%	1	Low
50-80%>	2	Medium
80%	3	High

Source: Miladan 2009

Table 4 Road Network Damages Indicators

Percentage damage	Weight	Classification Vulnerability
<30%	1	Low
31-60%>	2	Medium
60%	3	High

Source: Miladan 2009

Table 5 Result Physical Vulnerability

Parameters	damage	Weight	Classification
Travel Facility	100%	3	High
Road network	80%	3	High
Networkpower	100%	3	High

Source: Miladan 2009

2. Environmental Vulnerability
   Calculations in the vulnerability of the environment in the study area using a variable protection forest area located in District Ngancar. Parameters used by BNPB Regulation No. 02, 2012 on General Guidelines for Disaster Risk.

Table 6. Indicators of Environmental Vulnerability Assessment

Percentagedamage	Weight	Classification Vulnerability
<20 ha	1	Low
20-50	2	Medium
ha>50 ha	3	High

Source: BNPB No. 02 of 2012

Land use in the District of Ngancar such as garden, meadow, inland waters, plantations, settlements, rice fields, dry land farming season. But for this type of land located in the tourist resorts of Mount Kelud which is a protected forest. Vast protected forest in Mount Kelud tourist sites that are at KRB III and II on the area of 362.3 ha. Damage to forest areas when the eruption of Mount Kelud more than 50 ha, that is based on indicators of vulnerability assessment of the environment included in the classification of high vulnerability.

C. Preparedness Analysis

Analysis preparedness is used to determine the level of preparedness of travelers when visiting tourist sites Kelud after eruption using five parameters, such as knowledge about disasters, disaster risk reduction related policies, planning disaster risk reduction, early warning systems, and the mobilization of resources.

Knowledge of Disaster

At first parameter is the knowledge of the disaster, there are four indicators was asked of tourists, such as:

a. the most dangerous type of disaster at tourist sites based on the perception of tourists. It is to know what are the greatest disaster feared by tourists.
b. Traveller knowledge about the dangers of the volcano in case of eruption. Input rating calculations which are in the category very idea of the danger of eruption. It is to see how many tourists are well aware of the danger of eruption.
c. Source of information about the activities of Mount Kelud, in order to know where the tourist information about disaster-prone areas in the location.
d. Traveller knowledge related to disaster-prone areas Kelud.

Table 9. Percentage of Readiness on The Parameters of Knowledge About Disaster

Knowledge of Disaster	Presentase	Bobot
Most danger disaster	42% answered the eruption of Mount Kelud	14.7
Eruptionof knowledge about the dangers of	3% so knew the danger of eruption	1.05
Knowledge of disaster-prone areas	8% highly knowledgeable about KRB Kelud	2.8
Activity information	57% get information from the mass media	19.95
Result		38,5

Calculation Table 9 showed readiness in disaster knowledge parameter that is 38.5, so it can be concluded that the rating is not ready when viewed from the aspect of knowledge.

1. Disaster risk reduction policy

   Based on the results of field interviews that 66% of respondents said there were already policies related to disaster risk reduction but this policy has not been implemented properly. The form of the policy that is penginformasian Kelud activity level changes to the management by the postal authorities to monitor, then information of evacuation by the government to the management and dissemination of disaster-prone area maps. but the implementation is still not evenly distributed information so that only a few tourists who already know the related policy.

2. Disaster Risk Reduction Planning

   Respondents were used for this third parameter is the manager of a tourist location Kelud 35 people, as the third parameter to determine how ready the manager of the tourist sites in mengankan tourists visiting the event of a disaster. There are three indicators which asked that the measures taken in case of disaster, the ownership map disaster-prone areas, and readiness in case of eruption.

Table 10. Percentage Preparedness Planning Parameters Disaster Risk Reduction

Parameters	Presentase	Bobot
Steps in case of disaster	54% ran to safety location (10 km radius)	18.4
of disaster-prone areas	60% have a map KRB 21	
Readiness themselves in case of eruption	74% ready in case of an eruption	25.9
Result preparedness of disaster risk reduction parameters		65.8

Owners map

3. Early Warning System

After the eruption form of early warning system that there was only a warning from field personnel that travel locations prone to landslide hazards and provision of tourist information should reach the maximum limit of tourist sites. There are no signs primary and secondary alarm to remind tourists at tourist sites Kelud. In the early warning system parameters at Mount Kelud tourist sites there are three indicators were asked to tourists at the site are:

a. Sources of early warning information received by travelers.
b. This form of early warning system
c. Early warning system quality

Table 11. Percentage of Readiness on the Parameter Warning Systems

Early warning systems	Percentage	Weight of
Early warning information source	53% of security guards	2.65
Form of early warning system	28% stated already usingtools	1.4
Quality warning system early	5% said very good	0.25
Result readiness parameter early warning system		4.30

Early warning system should not only conventional form (direct warning from the clerk or laying down the guidelines) but also in the form of a siren. Form of the hazard warning sirens are now not in a tourist location.of calculation (Table 11) results parameters of an early warning system that is
4.30, so it can be concluded that an early warning system for tourist location is not ready to accommodate if there is an eruption again.

4. Mobilization of resources
In the parameters of resource mobilization, there are two indicators were asked to tourists at tourist sites, such as:
a. Knowledge travelers about first aid to victims of the eruption b.
Knowledge about how the evacuation of disaster victims

Table 12. The Percentage Of Readiness on The Parameters of a Resource Mobilization

Resource mobilization	Percentage	Weight of
Knowledge travelers on the way first aid	2% said it out	0.1
Knowledge of how to evacuate	9% so know how to evacuate	0.4
Total resource mobilization readiness parameters		0.5

(Table 12) calculation resource mobilization results obtained parameters of 0.5, so it can be concluded that for Traveller sumbersaya mobilization parameter is still not ready in case of an eruption.

3. Conclusions

The conclusion to be drawn from the calculation of disaster vulnerability, namely, that at tourist sites after the eruption of Mount Kelud still vulnerable to secondary hazard such as landslides and cold lava flood. In addition, the eruption that occurred have high destructive pot ential, it can be proved by calculation of the vulnerabilities that Kelud tourist locations have a high vulnerability in case of eruption. The most important thing in this experiment that tourists visiting preparedness after the eruption. Based on the calculation of preparedness that tourists who visit are still under-prepared in case of secondary hazards such as landslides and cold lava flood.

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Transportation Services Gig In Supporting Tourism Batu

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Abstract

The growing interest of tourist visitors an opportunity for a region, one of which Kota Batu to develop the potential of natural and artificial be featured in the region's tourism sector. Tourism development should be supported in Kota Batu adequate transportation infrastructure. To increase the sale value of the region can use transport carts as transportation media tour. With the support of regions that became the center becoming southwest Pull for visitors during the visit of Bau. It is necessary for the level of service gig at the moment, so it can be the cornerstone of the development of the transport system in the City of Rock.

Keywords: transport; gig; tourism; kota batu

1. Introduction

The prospect of development of tourism in Indonesia is very bright, because it is supported natural wealth and diverse culture with a set of characteristics. In supporting pariwiata needed infrastructure that adapts to the attraction and value of identity. Modes of transport by using carts is the identity of the community as a means of transportation and as a symbol of tourism. A region which has mengadpsi this mode adalak city of Yogyakarta, which is used as a mode visited tourist attraction that, if managed properly can improve the quality and comfort for visitors.

Kota Batu is one of the areas of tourism destination in East Java, the number of visitors increasing at the moment of the holiday weekend. Location of Batu in the plateau region, the presence of natural attractions, as well as supporting facilities and supported artificial travel make this area as a symbol of one of the East Java city of tourism. Parissata regional development should be comprehensive Batu one trasnportasi media. With an area that is relatively small and the distance between the adjacent tourist areas can use trasnportasi media that has a value that is traditional and comfortable with the gig. The use of carts in this area can certainly improve the beauty and the value of introducing classical transport identity faded with the latest transport. There are currently limited to the use of carts transporting agricultural produce to the market and from the market to the residence of passengers, necessitating the involvement or role of decision makers to plan and design this classic transport systems in order to have a value of transport medium in Kota Batu. In this study, focused on a form of service gig in support of the existence of Kota Batu as a transport medium tourism

2. Methods

2.1 Data Collection Method

2.1.1 Preparation

a. Collecting data on the study area in Batu
b. Determination of Population and Sample

Under the terms of sampling an even number, then the number of samples for levels of service gig as much as 100 samples of the total population will then be divided into three routes that have been set by comparison as follows:

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Table 1 Distribution of quota sample User Rating Gig Each These

No.	These	Total sample
1.	These Surrounding Town Square Batu	65
2.	These Java Square heading east park 1	20
3.	These market Square to the parent Kota Batu	15

2.1.2 Phase Survey

a. Observations

In this observation, the results include data covering about aksesibiilitas which includes the existence of buggy transportation, facilities such as bus stops or point of suspension, as well as physical conditions such as the condition of the train from the gig.

b. Interviews

Interviews were conducted so that the researchers have a list of written questions were detailed and is intended primarily to absorb the opinion or perception or opinion subjective nature

2.2 Analysis Techniques Data

2.2.1 Analysis Service Performance Transport Gig

Using analysis techniques IPA*(ImportancePerformance*Analysis)to obtain the level of satisfaction and interest as well as the position variable quadrant IPA. There are 5 levels of classification are: Very Comfortable, Convenient, Comfortable Enough, less comfortable and not comfortable. Through this technique, the analysis of information items performed surgery on 4 quadrants as follows: Quadrant I (Having*a high score of the level of interest, but scored lower in terms of satisfaction),* Quadrant II (Having*a high score both from the level of importance and satisfaction*), Quadrant III (Good*score the level of interest and kepuasaannya low*value), Quadrant IV (score*low importance but a score of satisfaction*high)

2.2.2 Analysis selection path

Analysis path selection has the objective to determine the pathways that are often bypassed by transport carts from point of origin to points of interest, or track gig transport operation. The journey can be divided into two groups, namely:

a. Generation trip*(trip*production) is a home-based movement that has a place of origin or destination is a house or a movement generated by the movement based not home (Tamin, 2000).
b. Pull movement*(trip*attraction)Is a home-based movement with the place of origin and / or destination is not home or is attracted by the movement of the movement based not home (Tamin, 2000).

3. Results

By looking at the results of the analysis MKA can be described as follows:

a. Performance Of Transportation Gig

Berdaasarkan perception of tourists who use carts, then the assessment of the performance level of carts, seen from three routes are often skipped, then in the can:

- Route A (surrounding the town square stone) by 83% included in the category quite comfortable.
- Route B (to the east of Java park 1) of 95% included in the category of very convenient.
- These C (toward the central market Kota Batu) of 91% included in the category comfortably.

So cumulatively then, the comfort level of service performance as perceived by travelers gig included in the category of ***comfortable***with value - average of 86.1%.

b. Study Selection Line

In review process route selection for a gig as a vehicle travel lane is done by looking at the route network with the shortest traveling time. Distance time is the time it takes passengers to travel (long achievement of sights and old tourist arrivals in tourist attraction).The alternative route of travel when using carts by type of attractions that can be offered to tourists visiting the Batu consists of two forms lane of travel, the alternative route alternatives A and B. The alternative route is determined by grouping these characteristics Attraction , namely leisure travel and shopping. With the determination of the route, it will be easier for tourists who want to enjoy holidays in Batu, and also in addition to enjoying the existing tourism, tourists can also enjoy traditional transportation ie carriage as a means of supporting the tour in Kota Batu

4. Conclusion

a. Knowing the level of service performance gig

Performance level service of the gig is known by analyzing the results of a questionnaire rating the results obtained by using IPA. The results of the method of science explains the level of satisfaction and interest from tourists. For tourists the level of satisfaction and interest has the highest number on the attributes or variables the coachman gig experience. And cumulatively travelers feel the level of importance and satisfaction atlevel *a comfortable*

b. For the Band Selectiongig

Selectiongig unknown pathway for travelers based on their interests and views on characteristics attractions frequented by tourists when using carts. Based on the characteristics of the attraction, then the procurement of alternate routes are divided into two routes, including Route 1 is classified into these recreational tourism, and for these two classified into shopping service.

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Mitigasi Disaster at Drainage Basin of Kuranji Padang City

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Abstract

Floods is flooding of effect of exit water groove river because big river debit sudden its accomodation energy, happened swiftly knock over areas which is debasement, in river basin and hollow. Flow debris or which is recognized with galodo have knock over river of Kuranji year 2012 in Padang city . Area is floods disaster are: 19 Sub-District in 7 district, and hard that is district of Pauh and district of Nanggalo. Governmental claim tired loss of Rp 263,9 Billion while Government of Provinsi West Sumatera appraise loss estimated by Fourty Billion Rupiah (Padang Ekspress 28 July 2012), with detail of damage house counted 878 unit, damage religious service house 15 unit, damage irrigation 12 unit, damage bridge 6 unit, damage school 2 unit, damage health post 1 unit. Result of calculation, by using rainfall of year 2003 until year 2015 with method Gumbel, Hasper and Wedwen, got high rainfall plan is 310,00 mm, and method Melchior and Hasper floods is 1125,86 m^3 / second. From result of study analyse at Citra map of correlation and image to parameters cause of floods, and use software Watershed Modelling System (WMS) this region have two class that is middle susceptance and low susceptance. Middle susceptance area is there are in middle river and downstream river, with inclination level off. Low susceptance area there is middle river. Area which have potency result the happening of floods is headwaters, because having keen ramp storey level (45 - 55%) and is hilly. For the mitigasi of floods disaster determined by three area evacuate that are : Sub-District Of Kelurahan Limau Manis District Of Pauh, Sub-District Of Surau Gadang District Of Nanggalo, and Sub-District Of Lambung Bukik District of Pauh, in the form of map

Keywords: floods; suspectance, mitigasi

1. Introduction

Flood due to water runoff that flow out of the river because the river discharge was suddenly enlarged beyond capacity, it happens quickly struck areas of humility and in the Valley of the rivers. With the increase of population that is increasingly rapidly brings impact to the increased needs of land and demand fulfilment services and urban infrastructure that can impact declining environmental quality such as environmental degradation and natural disasters. Of the review of the field is done, damages Watersheds (WATERSHED) at Kuranji river due to the occurrence of change of the function of a natural dam, the collapse of land and waterways. We know that the upstream is a functioning conservation areas set up stream to the middle and lower reaches of the river. Downstream, is a densely populated residential area. From some of the research that has been done for the determination of areas of vulnerability to flooding, flood occurrence parameter are: lack of infiltrasi water based soil type, slope, magnitude as a function of land, high intensity, high somewhere and nearby settlements were built from the banks of the river (the buffer). Flash floods or known as galodo have plagued Kuranji on 24 July 2012 and 12 September 2012 which has ravaged houses and equipment. The Government claimed the loss due to the deluge of Rp 263.9 billion. Daily rainfall average of 15 – 25 mm, being at the time of the occurrence of the flash floods of daily rainfall that is 54 mm. Slope of the average in the upper reaches between 45% to 55% (source Kuranji numbers in 2012). DAS area 202.70 km^2. Kuranji had the small river in upstream, namely Belimbing river with DAS 62.64 km2 and length of 17.08 km, Limau Manis with DAS 31.93 km2 and length of 16.42 km. In the middle area there is river Sungkai area DAS 6 km2 and a length of 3.63 km, Janiah Karuah with an area of 82.26 km2 and a length of DAS 18.86 km. population census by 2014 is 145,844 people. The upper area at altitude 150 – 175 m, the middle at an altitude of 125 – 150 m, downstreaman altitude of 1 – 12 m. High differences resulting from this enormous, resulting in if upstream happens rain intensity is high, the middle and lower area becomes flooded. For it in order for losses that occur mainly casualties inevitable, need for mitigation to reduce losses due to flooding by making the evacuation line in order to rescue for the community, and the normalization of the river.

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1.1 Strengthening Regulatory Legislation

In April 2007, two laws have been passed by the legislature, namely: ACT on disaster relief (Act No. 2/2007) and the ACT on Spatial (Act No. 2/2007) which is a revision of the previous ACT No. 24/1992. Laws and regulations are made given the vacuum of legal framework and laws and regulations pertaining to the handling of disaster risk must be paid dearly with the fall of casualties and enormous material losses

1.2 Public participation

Public participation is a process provided an opportunity for technical and broader authority to the community, so that the community is able to solve problems together. The Division of authority was conducted based on the level of community participation in such activities. Community participation (local wisdom) aims to find solutions to problems in a community, by opening up more opportunities for the public to contribute so that the implementation of activities running more effective, efficient, and sustainable.

1.3 Flood mitigation Stakeholders

Stakeholder response to flooding is generally classified into three, namely: (a) a society gets the impact directly or indirectly due to flooding; (b) community groups or individuals who may give consideration or facilitation in flood mitigation, such as: consultants, experts, NGOs, and professionals in the field of flood; (c) decision/policy makers/decision makers, institutions/institutional authorities make decisions and legal basis, such as government agencies and water resources Council.

1.4 Solving the flood with the approach of non flood disaster mitigation in non phisik/non structural

can be: spatial arrangement (land use arrangement) due to the occurrence of conversion of land into urban areas, intensive and continuous outreach involving community, NGOs. Making flood plain zoning, zoning-zoning arrangements, namely the utilization of space is differentiated according to the threat level because of the flood. So the flood plain zoning is effective instruments to avoid the occurrence in areas not yet awakened to the brakes on the occurrence of a change of function of the land according to law No. 25/2007 on Spatial and Act No. 7/2004 about Water Resources

1.5 Soil type

Alluvial soil is formed from the mud of the river that settles in the lowlands, it has fertile soil and is suitable for agricultural land. The soil is alluvial young who came from the results of the deposition. Alluvial soil at Kuranji has widely 5,445.90 ha b. an area of 12,921.16 ha. Because suitable as agricultural land, then this soil type will cause the occurrence of floods.

1.6 Environmental change

With the ever increasing human population has led to increasingly sensitive environmental conditions. Change the function of the land very large influence on environmental changes that result in a decline in land cover. The longer the amount of vegetation on the wane, particularly in urban areas. From the results of the inverstigasi BPN Padang city, that of the years 2009 – 2012 land use changes such as table in the following:

Table.1 Land use Change

No	Land use	Area Land (Ha)		Land Use Change (Ha)
		2009	2012	
1	Residential	176,84	327,55	150,71
2	Area Rain Waters	399,55	289,74	109,81
3	Gardens Mixed	972,06	1005,29	33,23
4	Moor Forest	2,50	3,65	1,15
5	Shrubs	75,52	58,27	17,25

No	Land use	Area Land (Ha)		Land Use Change (Ha)
		2009	2012	
6	Similar	7,62	6,87	0,75
7	The Others	116,78	59,5	57,28
	Amount	**1.750,87**	**1.750,87**	**378,18**

Are land cover vegetation that grows above the Earth's surface will cause the increasing surface flow (run off). Surface flow occurs when rainfall has exceeded infiltration rate of the soil. According to Castro (1959) the level of surface flow in the forest is of 2.5%, 3%, coffee plant grass 18%, while the ground is about 60%. While based on research in Onrizal (2005) DAS Ciwulan, deforestation led to the increase in surface flow of 624 mm/th. It's the new calculation performed on the area of forest is cut down where there are still lucrative land who could infiltrasi. Research of Lusi Utama, 2014, with the use of a map Image and the correlation with the parameter causes flooding, gained the flash flooding potential at Kuranji WATERSHED. Based on the results of the analysis of the parameters of the flood areas there are Kuranji Rods obtained two (2) classes of vulnerabilities and vulnerabilities middle are vulnerabilities that is low. There is a flood-prone area in the middle and downstream areas, with the slope of the slopes. Are areas that could potentially lead to the occurrence of floods is upstream, because it had a sharp level and hilly. The vast pool of skoring value based and the level of insecurity area turns Kuranji flood is an area in the vulnerabilities middle. Of the 15 villages there are three wards that low levels of vulnerabilitieswhich means it is safe from the dangers of flooding, Gunung Sarik in the middle, Kapalo Koto (upstream) and Limau Manis (upstream), but easily the occurrence of landslides, since the slope a sharp slope. 12 the village is an area of vulnerability middle, that means the sloped area is relatively flat, sharp, and altitude as a function of the land.

The Purpose and Benefits of the Research

The research aims are as follows:

1 Perform flood mitigation in the form of the creation of a map of the evacuation line.
2 Determine the place of evacuation
3 Normalization of the River in order to be able to accommodate the river discharge in the circumstances of the discharge maximum

Benefits of research:

1 There is a map/evacuation line for area/flood-prone neighborhoods.
2 There is a temporary shelter for the community when the flood occurred. This can reduce the disaster victims.

2. Methods

Using a map image and map study of vulnerability to flooding along the Kuranji ARGIS x. 1, is expected to come by the evacuation line and place the temporary shelter. A temporary shelter was planned in areas closer to the location of the floods, but have height, so that people can be evacuated. Besides conducting cooperation between communities and Government in reducing the risk of flooding. These activities are based on the parameters of the cause of the flooding is like making a well infiltrasi, normalization of river rock material, giving the building permission by the rules. In addition need to flood control planning buildings such as making buildings and building control sediments

3. Results

Map of Routes for Evacuation and shelters

Figure 1: Map of Routes for Evacuationand Shelter Limau Manis

Figure 2: Map of Routes for Evacuation and Shelter Surau Gadang

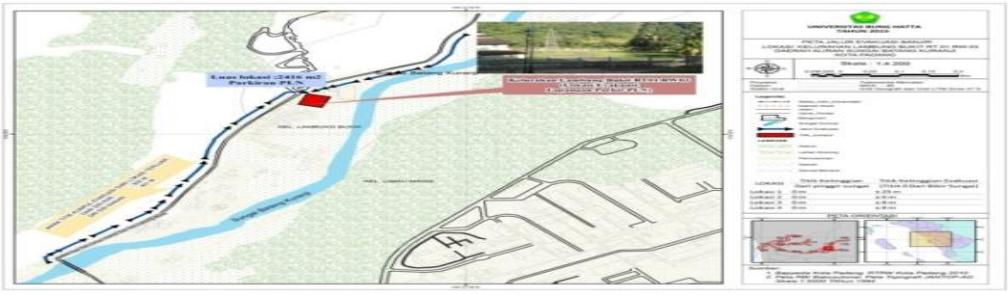

Figure 3: Map of Routes for Evacuationand Shelter Lambung Bukik

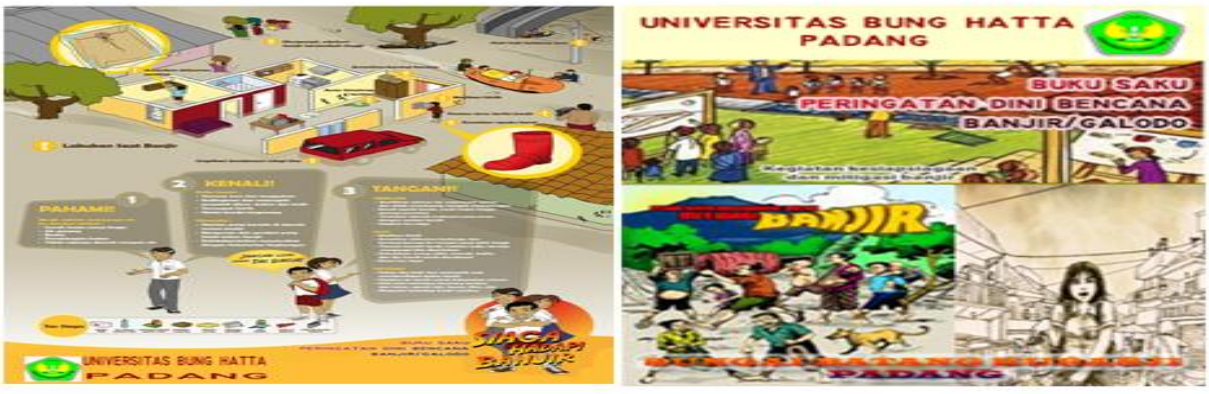

Figure 4 : Pocket Book: Ready to Accept Floods

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Assessment of Land Allotment Support Power Industry in Grati, Pasuruan Regency

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Abstract

The industrial sector is always in need of land for factory as well as other supporting facilities, on the other side of the ability of the environment (support) the uneven terrain of every area in favor of intensive activities such as industry. Land uses that are not adapted to the support power, will cause pollution, damage, disaster and loss that generally uses the environment. The purpose of this research was to assess the resources support neighborhood sub district grati associated with the existence of a plan to build an industrial area in accordance with the direction of Grati utilization of space in the spatial plan of the Pasuruan Regency area. In this study of land carrying capacity power comparison capability and land use. The Analysis technique used is the technique of overlay with analysis tools namely software using the software Arcgis 10.1. The parameters of the ability of land-adapted to the characteristics of the land for industry, namely the slope the slope ranges 0-25% on the slope of 25-45% can be developed with industry improvement area contours, and on a slope above 45% not allocated as an industrial area, the type of soil that is not easy slopes, the intensity of the rain of less than 3000 Mm/Th, potential landslide and flood-prone lowlands. Each parameter will be provided scoring between 1-5. Score of 1 was given to the condition of land the most harm, and a score of 5 is given for the condition of the land which supports most of the location industry. The result scoring is divided in 5 class that is bad (5-9), is rather bad (9.1-13), medium (13.1), somewhat good (17,1-9) and good (21.1-25). The need for industrial land, calculated from the vast land of existing industries. Based on research results, obtained the ability to land on the area of research has 3 classes of 5 classes, i.e. rather good, moderate and somewhat bad.. The results of the comparison between the broad capabilities and the needs of the farm industry, it can be concluded that the power of the land to support the industry in sub Grati still has not been exceeded.

Keywords: industrial carrying capacity;

1. Introduction

Sub Grati pasuruan is a part of the territory of the Pasuruan Regency has potential economically particularly for industrial activity. The potential is supported from the administrative location and accessibility. In the regulatory area of the Pasuruan Regency number 12 in 2010 about spatial plan Pasuruan Regency Year 2009-2029 Government wanted to expand the industrial park in the Eastern District, this is done to reduce the disparity of development between the eastern region and Western region. Seen from accessibility Grati this will pass by jalan Surabaya-Pasuruan toll road. Accessibility is important because of the large and medium industry trend in big cities is no longer oriented on the market and raw material but rather on sector transportation infrastructure (roads) and labor (Farid, 2004). The toll road development plan currently in the work by the Ministry of public works to support the traffic of heavy payloads.

The industry desperately needs land to set up factories and its supporting facilities. The land becomes an important parameter to consider his ability especially for large industry events because the land has a very limited with the ability that vary and tend to experience a decrease in serving the demands of development [3]. To find out how the ability to do analysis the ability to land by using some parameters. Land that could be used for industry have in common parameters with land for settlements [4] i.e., slope, rainfall, soil type, and the potential for disaster. See the potential and that problem, then research has the objective to analyze how the ability to land on the area of research and identify how the land use activities of big industry. Land use is important to know because it can show where the

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big industry is located. Location of big industry mandatory are in industrial areas. This is contained in Government Regulation No. 2 of 2009 about industrial area. In addition the identification of land use can provide information land area used large industry activities. The land area required for analyzing the land needs of great industry . A comparison between the requirements of the land and the ability to land this is called power carrying capacity of the land. Power support's assessment of land important to do so that development remains sustainable. Any activity that will be carried out, power support into a mandatory note because of land use which does not comply with support power will decrease result in a quality environment such as pollution, damage, disaster and other losses.

The purpose of this research was to assess the resources support neighborhood sub district Grati associated with the existence of a plan to build an industrial area in district Grati. This is in accordance with the direction of the utilization of space in the spatial plan of the Pasuruan Regency area.

2. Methods

To know the ability of land suitable for industrial activities done with information systems approach using geographical analysis of overlay, and to know the land use interpretation is done by industry using the software Arcgis 10.1. In general the SIG can be interpreted as a component that consists of the device software, hardware, geographic data and human resources. All the components of the mutual cooperation are effective to enter store to repair, renew, manage, analyze and display data in a geographic-based information (GIS Consortium, 2007).

Engineering overlay done by using 5 parameters units of land capability (SKL), the ability of land slopes 0-25%, or 45% of the units the ability of land contours, the unit's ability to land the kind of soil that is not easily eroding land capability, the unit of rain intensity less than 3000 mm/yr, a unit's ability to land a potential avalanche-prone and unit ability of land flooded. Each parameter of a unit's ability to land will be mapped and provided scoring between 1 to 5. A score of 1 was given to the condition of land which is most detrimental to the industry, location and score 5 given for the condition of the land that supports most industrial locations. The results of the scoring are divided into 5 classes, namely bad (5-9), it is rather bad (9.1-13), medium (13.1), somewhat good (17,1-9) and good (21.1-25).

Table 1. Parameters Of Land Slopes

No	Slope Of The	Description	Slope Of The	Score
1	0-8	Flat	0-8	5
2	8-15	Ramps	8-15	4
3	15-25	Somewhat Steep	15-25	3
4	25-45	Steep	25-45	2
5	> 45	Very Steep	45	1

Source: Agriculture Minister SK 683 / KPTS / UM / 8/1981

Table 2. Parameters Flood Potential

No	Depth Stagnant	Potential Puddle	Score
1	< 1	Low	5
2	1-3	Medium	3
3	> 3	High	1

Source: BPBDS 2012

Table 3. Parameters Rainfall

No	Intensityrain (Mm / Th)	Score
1	0-1500	5
2	1500-2000	4
3	2000-2500	3
4	2500-3000	2
5	> 3000	1

Source: Minister Of Agriculture Decree 683 / KPTS / UM / 8/1981

Table 4. Parameters Type Of Land

No	Soil Type	Rate Sensitivity Erosion	Score
1	Alluvial, Gley, Palnosol, Hidromorf Grey	Insensitive	5
2	Latosol	Somewhat Sensitive	4
3	Land Forests Brown Not Bergamping, Mediterranean	Less Sensitive	3
4	Andosol, Laterite, Grumosol, Padosol, Padsolik	Peka	2
5	Regosol, Litosol, Organosol, Renzina	Extremely Sensitive	1

Source: Minister Of Agriculture Decree 683 / KPTS / UM / 8/1981

Table 5. Parameter Potential

No.	Landslide-Pronepotential Sensitive	Total Surface Land Lost (Cm / Th)	Score
1	Low	> 0.9	1
2	Medium	0.9- 12:18	2
3	High	> 1.8	3

Source: Muta'ali 2012, BPBD

Table 6. Land Capability Classification

No.	Industrial Land Capability	Total Score
1	Good	21,1 - 25
2	Somewhat Good	17,1 - 21
3	Moderate	13,1 - 17
4	Somewhat Poor	9.1 - 13
5	Poor	5-9

Sumber: Fadeli, 2000

Data Unit of land capability slope land, soil type, rainfall, landslides and inundation-prone potential derived from the Spatial Plan of the map area of East Java province in 2009-2029.

From the data unit of the ability of land above, then using overlay to get capability Grati Subdistrict land. This ability further data will be overlayed with existing land use data to assess the carrying capacity of land resources Sub Grati with software Arcgis 10.1. Based on the regulation of the Minister of the environment number 17 in 2009 regarding the determination of the power guidance support environment, then an assessment of the status of land support resources are formulated as follows:

$$DDLI = \frac{SL}{DL} \qquad (1)$$

Description *(1)*:
DDLi = Power Support Industry Land SL = Availability Of Land
DL = land Needs
Rumus diatas menandakan apabila:

- SL more than DL or where land availability is greater than their needs then the power support land declared surplus has not been exceeded
- SL less than DL or where the availability of land smaller than on its needs, then the power support its deficits have been exceeded.

3. Results

The study produced seven maps, the slope maps, maps of soil types, rainfall distribution maps, maps prone to landslides, flooding hazard map, a map of existing industrial land use and land capability map.The following map units the ability of slope land and map land capabilities soil type units of the Sub-District Grati, Pasuruan Regency:

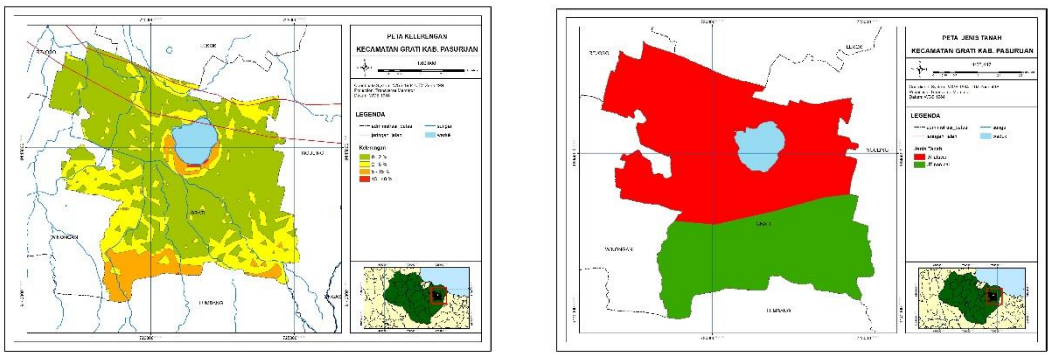

Fig. 1. (3.1) a slope map; (3.2) the map of soil types

4. Conclusion

Based on research results, obtained power support environment Sub Grati surplus or has not been exceeded. This means that the physical condition of land in district Grati capable to support indusstrial activities are directed in this Subdistrict.

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Infrastructure as a Shared Resource of Tourist and Non-Tourist Activities in a Disaster Prone Area

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Abstract

This research focus on one of vulnerable area in Indonesia, that is in surrounding Mount Merapi. The eruption of this volcano had damaged the infrastructures in this area. Given that, the tourists and non-tourists activities have grown significantly, the demand and use of infrastructure is getting high. Thus, this research aims to explore the characteristics of infrastructure in this area based on the concept excludability and rivalry. Clean water, irrigation, and electricity system, as well as road and bridge are found as the shared infrastructures for both tourist and non tourist activities. Here, most of the infrastructures in this area are common pool resources with low excludability and high rivalry. It is getting higher during the disaster. Thus, overexploitation is the main issue and fair rules in use (institutions) of these infrastructures are needed.

Keywords: infrastructure; disaster prone area; common pool resource

1. Introduction

The Mount Merapi is noted as the most active volcano in Indonesia. The last eruption in 2010 had damaged five of 17 villages in its surrounding. Most of infrastructure and local facilities are damaged after the eruption. The community who survived from this disaster cannot do their regular activities such as farming and agriculture [1]. Hence, the rehabilitation of this area particularly the infrastructure is urgent to foster the redevelopment of this area.

The area in surrounding Mount Merapi is also illustrated an interesting phenomenon, as the eruption has attracted more visitors in this area. Previously, the Mount Merapi is famous for tracking and ecotourism activities; however the eruption has attracted other volcano tourism activities, such as volcano tour that explores the disaster area. These activities has contributed on the local economy of the villagers [2] through some additional income from tourists who pay for the villagers services.

Hence, it is noted that two types of activities exist in the disaster prone area of Merapi, that is, tourist activities and non-tourist (community/villagers) activities. In order to perform these activities, the actors (tourists, tours operators, and community) need infrastructures. However, most of these infrastructures are located in the Disaster Prone Area II (Kawasan Rawan Bencana II) which is potentially devastated by lava and hot cloud during eruption. Given that, the infrastructure in this area is limited, it can be assumed that the actors need to share infrastructure [3]. In this discussion, some issues might occur such as over exploitation of the infrastructure. Hence, this research aims to explore the characteristic of infrastructure in a disaster prone area as shared resources of tourist and non-tourist activities.

This study adopts an exploratory case study [4, 5] in order to explore the utilization of infrastructure as shared resources of tourist and non-tourist activities. This research is conducted in Umbulharjo Village and Kepuharjo Village, Sleman - Yogyakarta. These villages are located in the disaster prone area of Mount Merapi. This research applied in-depth interviews and naturalistic observation in data collection. The data were collected in July-October 2016. The participants were selected through snowball process. In total 20 peoples were interviewed. Additionally, we also observed the conditions of infrastructures in this area. The type and location of the infrastructures were gathered from the interviews. This naturalistic observation is also the mean to confirm (triangulate) the information from interviewing the participants [6]. Furthermore thematic analysis was applied in analyzing data [7].

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2. Ostrom's types of goods as the theoretical framework

Based on two main attributes of the goods, that is, sub-tractability of use (jointness of use or consumption) and difficulty of excluding potential beneficiaries, the goods can be classified into private goods, public goods, common-pool resources, and toll/club goods [8]. 'Private goods' are both subtractive goods and high rival in consumption. These goods are commonly provided by the market, and the actors have property right on the goods by paying the cost of consumption [9]. 'Public goods' refers to non-subtractive goods that all users can gain benefit from. In the case of 'common pool resources', users cannot be excluded from accessing the common-pool resources, but the consumption of this type of goods by one user can influence other users' opportunities to gain common pool resources [10]. Lastly, 'toll/club goods' refers to non-rivalrous but small scale goods that members of the club can gain benefit from while excluding non-members in its consumption. Additionally, the scholars address membership fee or toll payment as the determinant factor to gain benefit from club goods. This payment is likely to be referred to as the exclusion cost of the club goods, such as single membership fee (coarse exclusion) and single entry fee (fine exclusion) [11].

3. Results

3.1. Exploration of tourist and non-tourist activities

This research found four types of tourist activities in Umbulharjo Village and Kepuharjo Village, i.e. volcano tour, live in, camping, and golf. The tourists can explore Mount Merapi through an activity called as volcano tour. Jeeps and motor bikes are the main vehicle in this tour. The tourists can see the evidences of Mount Merapi eruption in 2010, such as Museum Mini Sisa Hartaku, bunker, and Mbah Marijan graveyard. Alternatively, the tourists can experience real life in a village through live-in program in Umbulharjo Village, particularly in Pentingsari. Here, the tourists can stay in a home-stay and experiencing the life of farmers in this village. The tourist can also have an outdoor experience in camping ground. Usually this kind of tourists comes in a group. On the other hand, such individual tourists prefer a quite environment by staying in a resort that also provides golf and spa as the main attractions.

In terms of non-tourist activities, the villagers have agriculture, farming, plantation and sand mining. The farmers in this village plant paddy, vegetables, fruits, clove, and coffee. They also raise cattle, such as cow and goat. Some of the villagers have livelihoods on sand mining, particularly in Kali Gendol. This sand is the result of Mount Merapi eruption. Given that sand mining is quite profitable, this activity also attract peoples from the other villages or regions to make living from this activity.

3.2. Infrastructure as shared resources of tourist and non-tourist activities

This research found that tourists and non-tourists activities in these villages use four kinds of infrastructure, i.e. clean water system, road and bridge, irrigation, and electricity system. These infrastructures are located in the whole area in these villages and managed both by community and local government.

Related to issue of sustainability in managing these infrastructures, this research analyzed the typology of these infrastructure based on the concept of rivalry and excludability of good [10]. The clean water and irrigation systems illustrate almost similar characteristic. In the beginning (water source: spring or dam), the water are common pool resources as all of people can access water but once the water is consumed, the other user will have less benefit from the water. In order to manage water in this situation, gentleman agreement among the users is needed. This research noted that some big users, such as PDAM Kabupaten Sleman and *Cangkringan Villa and Spa* get their clean water from the spring in this village through primary system (3 inch pipeline). This characteristic has changed in the secondary system (1 inch pipeline) where the water is distributed to individual users, such as a house, a field, or a farm. Here, the water becomes a private goods as only the person who has the property can access the water. In order to avoid overexploitation of water in each user, a fair charging system is necessary. The rivalry to access water is getting worse after Mount Merapi eruption as some clean water pipes and irrigation system were damaged caused by cold lava. This situation has emphasized the significant role of rehabilitation process in a disaster prone area, particularly in infrastructure development.

The users both tourist and non-tourist also utilize electricity as a private goods. The electricity system in Indonesia that is distributed individually for each user based on the requested capacity gives the opportunity of each user to exclude other potential users. However, this situation might change during disaster when the government needs to shutdown the electricity for safety purpose. Here, the users might need to share with other users, and electricity becomes a common pool resources.

The road and bridge illustrate characteristic as a common pool resource, both tourist and community use these infrastructures for their activities. Given that some parts of these infrastructures are damaged after the eruption, the rivalry to access these infrastructures are getting higher. It is getting worse as high activity of sand mining contributes in damaging the roads and bridges. Furthermore, the worst situation is during the eruption, as road and bridge are used as evacuation path.

Table 1. Typology of infrastructure in the disaster prone area

		Sub-tractability of use	
		Low	High
Difficulty of excluding potential beneficiaries	Low	*(Toll/club goods)* -	*(Private Goods)* 1 inch clean water system, irrigation, electricity system
	High	*(Public Goods)* -	*(CPR/ Common Goods)* 3 inch clean water system, road and bridge

3.3. The management of infrastructure in disaster prone area of Mount Merapi

This research found that several stakeholders involve in managing infrastructure in this area. It is illustrated in the management of clean water both in the primary and secondary system. In the primary system, at least two types of actors manage water from the spring, that is, the Umbul Wadon. These actors are local government (PDAM Sleman, PDAM Tirta Marta Yogyakarta and PD. Anindya.) and community representative (OPAB Tirta Gondang Hargobinangun and OPAB Umbul Toya Rasa). Each actor have own (3 inch) pipeline and small reservoir. In order to prevent the conflict among these actors, there is an agreement that the distribution of the clean water is 50% for local community (for clean water and irrigation), 35% for community in other regions (for clean water distributed by PDAM Sleman, PDAM Tirta Marta Yogyakarta and PD. Anindya), and 15% for conversion. This distribution is managed by Department of Water, Energy, and Mineral Resources/ Dinas Sumber Daya Air, Energi dan Mineral (SDAEM) Sleman Regency and Mount Merapi National Park/ Balai Taman Nasional Gunung Merapi (TNGM). These agencies act as regulator and facilitator in managing Umbul Wadon Spring.

Furthermore, both PDAM and OPAB distribute clean water from small reservoir to their customers. They will use secondary system (1 inch pipeline). The PDAM charges their customers based on the consumption. However the OPAB uses flat payment for their customers. Given that the OPAB is a community based organization, this payment system is based on the agreement among the local community. OPAB Tirta Gondang Hargobinangun distributes clean water for the community in the Umbulharjo Village, the community have to pay Rp 5.000 (± USD $ 0, 40) each month. On the other hand, the community in the Kepuharjo Village served by OPAB Umbul Toya Rasa have to pay Rp 10.000 (± USD $ 0, 80) each month.

Although there is a clear regulation on the distribution of clean water from Umbul Wadon Spring, the local community has to consume clean water less than the agreed quantity. The PDAM as the big users acquire water more than 35%. This situation is getting worse after the Mount Merapi eruption damaged some pipelines. The PDAM with their financial capacity can restore the damaged pipeline. This is opposite with the local community with their limited financial capacity.

The local community in this area also has a local institution in managing water for irrigation, called as P3A (Petani Pemakai Air) Umbul Rejeki. This institution works together with the management of Merapi Golf in managing irrigation from DAM Plunyon. The irrigation system for Merapi Golf is developed and managed by its management, while for the community it is by the SDAEM Sleman Regency. Furthermore, the P3A (Petani Pemakai Air) Umbul Rejeki manage water for irrigation based on the members agreement. There is no fee for the local community to use the water for irrigation.

In the electricity system, this area illustrates no significant issue related to sharing electricity. This is due to national system of electricity distribution to the community. The national electricity company/ PLN works on the installation and maintenance of the system. Fair charging system is applied for each user based on the consumed electricity. Furthermore, this company also has a mechanism during a disaster to protect the community.

In terms of road and bridge, this research found that these resources are managed by the Public Work Department and the village governments of Umbulharjo and Kepuharjo. In order to prevent overexploitation of these resources particularly from sand mining activities using heavy vehicles, there is an agreement to separate the road and bridge for 2 wheels vehicles and for 4 or more wheels vehicles. The last group is including the jeep for volcano tours. This

research found that the roads and bridges in this area are used frequently both by the tourist and non-tourist activities. Given that, some of these resources are located in the disaster prone area II, the local government has a strict regulation to prevent the use of these resources, except for evacuation routes.

4. Conclusion

The volcanic activity of Mount Merapi has situated Umbulharjo Village and Kepuharjo Village as one of vulnerable area in Yogyakarta. In order to foster the development of the area in the Mount Merapi after eruption, the rehabilitation of infrastructure is needed, and the fast growth of tourism activity can be a trigger in the rehabilitation process. However, this research found that basically infrastructure (except the electricity) is a common pool resource for both tourist and non-tourist activities [3]. Here, the popularity of Mount Merapi as the main attraction in Yogyakarta might cause high rivalry to access the infrastructure and trigger its exploitation. The problems occur when several actors with own users manage a resource. Conflict of interest has occurred both in the normal situation and during or after disaster. Thus, the clear institution (rules in use) in managing infrastructures in this area is significantly needed. Both situations (normal, disaster, and rehabilitation) are needed to be addressed in defining the institution. Furthermore, the community, tour operators, as well as tourists as the users of these infrastructures need to participate in defining and implementing the institution,

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Innovation System and Regional Development: The role of Inter-actor Collaboration in creating low tech Industrial Innovation

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Abstract

Innovation has become a major factor in improving the competitiveness and economies of a region. The regional innovation system has been considered as one of the tool that could facilitate growth of innovation by using the concept of collaboration between institutions. This condition occurs along with the shift of paradigm of the model of innovation from the linier model that focuses on R&D toward non linier model which is achieved through interactive process. This view implies the existence of a social process that involves cooperation and collaboration among actors in the creation of innovation. Therefore, innovation has no longer an absolute of the result of R&D, which is generally done by high-tech industries, but the industries with low level of R&D can also make innovations. This study highlights on the role of actor on inter-actor collaboration in creating innovation for low tech industries. Pekalongan Municipality with batik industries is used as the case study for this paper. The result of the study concludes that there are 4 kind of innovation created in Pekalongan batik industries i.e.process, product, organization, and marketing. The innovations are created by 5 main actors i.e government, universities, industry, social organization and financial institution. However, in creation of one kind of innovation was not always formed by all of the five actors. The implementation of innovation system policy will influence the role of the actor in creating innovation in Pekakalongan Municipality.

Keywords: Innovation policy, Low tech Industry, Collaboration

1. Introduction

Innovation is not a new phenomenon both in industry and regional studies. Innovation has become an important commodity from science exploration and learning. It cannot be separated from human who tends to think and find new and best ways in doing something (Fagerberg, 2003). Formerly, Innovations are still seen as R&D result with radical and significant changes from the research object [23]. High tech industries are being mentioned as potential sector to create innovation radically [23], (Abernathy & Utterback, 1978)

Technology and innovation-oriented policy is one of the widely-used extensional of the regional policy in industrial countries that focuses on high-tech industry advancements. It is considered capable of offering the most productive environment for business development investments and human resources [24], thus triggering regional development. For years high-tech industries, supported by research and development (R&D) teams, have been seen as an integral sector in increasing regional competitiveness and economy by creating radical innovations. This claim was supported by numerous statistical assessments conducted by OECD (Organization for Economic Co-operation and Development),

through the assessment method and industrial sector classification based on R&D intensity on the production (Hatzichronoglou, 1997). The method has exalted the superiority of high-tech industry over low-tech industrial sectors across the globe.

The recent publication on the study of innovation has suggested that approximately half of the innovative enterprises develops their innovations without R&D [11]. In 2005 and 2008, experts such as Hirsch-Kreinsen and Heidenreich challenged the perception of high-tech industries' R&D as the only sector capable of responding to future

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challenges of innovation and technology. Rather, it is asserted that innovations can be achieved through tacit and practical knowledge; by improving the smallest details, even without the R&D process [1],[16],[19].

This stance sparked discussions regarding the role of low-tech industries in increasing the economy and birthed the concept of a regional innovation system, which emphasises the collaboration between various institutions and local-based manufacturers in order to innovate and increase the competitiveness of low-tech industries, as well as developing regional competitiveness [8],[9],[21]. In the interest of ensuring a functional regional innovation system, the government has established a regional innovation system policy that enables various institutions and local-based manufacturers to connect [8]. This emphasis on institutional collaboration under certain conditions of innovation policy-setting in the specific region had similarities with the concept of institutional thickness [13].

Several researches on innovation in the low tech industries have been conducted, which most of them are based on project in Europe such as PILOT (Policy and Innovation in Low-tech Industries) [14] 0research on identification of innovation pattern in low tech industry [12], and SMEPOL (SME Policy and the Regional Dimesion of Innovation) [2]. Whereas, study on innovation in industries in Asia, such as in India [17]; Singapore [6]; and Hongkong [5], still focuses on high tech industries as the main sector in the innovation policy agenda.

In Indonesia, research on innovation in the low technology industries had been conducted by Tarwa [15]. The study discusses about the innovation process in small and medium industries (SME), which was focused on the ability of management and the development of inter-industries. But, it lack of explanation on relationship and collaboration between actors and innovation policy. Hence, this paper is going to uncover the innovation pattern occurred in the low tech industries through collaboration. This paper aims to analyse the role of actor on inter-actor collaboration in creating innovation in low tech industries

Pekalongan, which has some of the largest low-tech batik industries in Indonesia, is one of the regions that has applied the regional innovation system policy. The batik industry is one of the economic backbones of the city, therefore, it is important to develop and increase the competitiveness of this low-tech industry. For this reason, Pekalongan was chosen as a case study.

The result of the study reveals that there are 4 kind of innovation being developed in the batik industry in Pekalongan Municipality i. e process, product, organization, and marketing, each of innovation influence one another. In its process, there are 5 actors that plays important roles in encouraging the creation of innovation i.e government, universities, industry, social organization and financial institution. However, in creation of one kind of innovation was not always formed by all of the five actors.The implementation of innovation system policy will influence the role of the actor in creating innovation in Pekalongan Municipality.

2. Research Method

Qualitative case study research is being used to answer the main question: How does the role of actor on the inter-actor collaboration to create innovation in low tech industries. The conceptual approach used for answering the research's question is The Regional Innovation System. The Concept emphasizes on the collaboration of various actor in order to push the creation of innovation in a region (Asheim & Coenen, 2006). The analysis of the study is concern with implementation of innovation policy and the role of actors in creating batik innovation in Pekalongan Municipality.

The snowball sampling interview technique is used to explore much deeper information from the interviewee. The interviewee which comes from many different institution such as universities, vocational schools, governmental institution and also other party that have correlation with batik's industry Researcher used the information from the first interviewee to determine the next interviewee. The technique of interview being used was semi-structured interview in which the researcher prepared the question and then the question would be developed based on interviewee's answer. In order to explore opinions from each interviewee, researcher used single question for a couple of interviewee.

3. Results

The discussion will be divided in 2 steps. The first step will describe the implementation of innovation policy in Pekalongan Municipality. The second step will explore the role and collaboration of inter-actor in encouraging batik innovation creation.

(1) Implementation of innovation policy

Innovation system policy in Pekalongan was applied in 2011 in accordance with the Joint Decree (SKB) of The Ministry of Home Affairs and The Ministry of Research and Technology number 3 and 36 of 2010, concerning strengthening regional innovation systems. The Government of Pekalongan City realized the importance of innovation to increase the competitiveness of the region. Therefore, the Pekalongan government wanted to apply innovation system policy to build innovation climate for all SKPD and to achieve the vision and mission of the region.

The application of innovation policy is adjusted with the vision of the Pekalongan City. One of the visions is to make Pekalongan city as a service city with emphasize the priority to Batik as the best potency of the region. It also becomes a tagline of the city 'The world City of Batik', which can be easily found along the road of the city. Innovation policy applied by the pekalongan government has driven institutional and policy change. The changes are as follows:

(a) Creating links between researcher and users

The government, in order to create a link between the researcher/inventor to the users, has formed Research, Technology and Innovation Office (Ristekin) in in September 2014. Several programs that has been conducted by ristekin for encouraging batik innovation creation are:

- Facilitating and funding several selected researches. The Batik E-market place research, which was conducted by STIMIK, andthe batik Pop Book for beginner, whicah was conducted by Pekalongan University (Unikal), has received such research funds. After the completion of their reasearch, Ristekin facilitates the researcher to meet with the user, in this case the user are The Department of Industry, Trade, and small-medium enterprises (Disperindagkop UMKM) as for the E market place and The Department of Education and Sports (Disdikpora) for the batik pop up.
- Ristekin along with Regional Development Agency (Bappeda) and The Agency for the Assessment and Application of Technology (BPPT) has established batik technopolitan for encouraging innovation creation through training and batik marketing.

(b) Encouraging Batik learning program for community

Several programs also launched for promoting batik learning in Pekalongan such as including batik as a mandatory curriculum for elementary school, optimizing the batik museum and encouraging opening batik faculty in established university in Pekalongan.

(2) The role of Inter-actor Collaboration in creating Innovation

Based on the synthesis of the research data, there are 4 batik innovations in Pekalongan i. e product (natural colouring batik, new motif) process (using the new natural material i. e indigo, tea leaves and tree skin), organization (new partner from training) , and marketing (e-marketplace). All of the innovation are created through collaboration among actors.

(a) The Product and process innovation

The product and process innovation are the result of collaboration between the industry, university, social organization and financial institution. The entrepreneur as the representative of industry make a 'trial and error' experiment for obtaining the desired colors and patterns. In conducting the experiment, they also share their experience, both failure and success, of the experiment in their informal organization ATIKA (Asosiasi Batik warna alam/Association of Natural Color). The experience sharing is usefull to get a positive input on the experiment from the other member. On the other hand, their collaboration with the university also help improving batik knowledge. Occasionally, they also need more fund to do the experiment, so several of them are taking loans to the Kospinjasa (one of financial institution in Pekalongan)

(b) The Organization Innovation

The organizational innovation are conducted by finding a new partner from each training that they held. Organizational innovation involves several actors such as the industry, the university and the government (disperidagkop UMKN and Batik museum). Senior entrepreneur are conducting training with the objective of transferring batik knowledge to new prospective entrepreneur. The collaboration with university are conducted

by sending the student form the university for an internship program in the enterpreneur's workshop. Realizing their contribution in preparing skillful employees and in turn they also give benefit for local economic development, the government then provides a facilities for transfering their knowledge as a trainer in the batik museum. Often, the training participant in the museums will continue their learning to the trainer workshop.

The process would give a benefit for the entrepreneur because they can select the best prospective employee to be promoted as a future business partner for the development of their business.

(c) Marketing innovation

Marketing innovation is the result of collaboration between industry, government (Ristekin, disperindagkop), and university (STIMIK). In this case, the government plays an important role to link the researcher/inventor to the user. STIMIK, , was conducted study on e-market place and they received research fund from Ristekin. The Ristekin then brought the research to the user, Disperindagkop. Disperindagkop would then socialize the e-marketplace to the industry to help the marketing of their product.

From the various roles of inter-actor collaboration mentioned above, we can conclude that in general each actor role are as follow:

Government as policy maker and intermediate institution
University : as learning institution, and inventor
Industry: as inventor and batik instructor
Social Organization: Share on informal information about new issue on batik
Financial institution : Provide business capital

From this study on batik innovation creation in Pekalongan Municipality, we can conclude that there are 5 actors that plays important role in encouraging the development of innovation in low tech industry i. e government, university, Industry, social organization and financial institution. This condition was not different with the process of creating innovation in high-tech industry, as argued by Castells & Hall [6] that there are 5 actor that influence high tech innovation. The result of this study denied the study conducted by Kaufman & Todling [16] who expressed that the university does not give significant role on low tech innovation. on the contrary, the university has given great contributions in the form of knowledge transfer, invention and creating new entrepreneur for batik industrial in Pekalongan.

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Minapolitan Region Development Analysis at Penajam Paser Utara using Blue Economy Concept

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Abstract

Penajam Paser Utara (PPU) Region in East Kalimantan was assigned as one of minapolitan area in Indonesia focusing on aquaculture based on Indonesia Ministry of Maritime Affairs and Fisheries Decision Number 35 in 2013. Unfortunately, it is shown from PPU region statistics data that decreasing fisheries production in PPU region was occur especially for land fisheries from 2013 until 2015. The aim of this study is to formulate development strategies of minapolitan in PPU Region by the Blue Economy concept. Several variables such as fisheries and aquaculture aspects, processing and marketing, incomes and workers, also sustainability and economic paradigm is evaluated in this study. Firstly it needs to identify the potential of character and problem by reviewing minapolitan area in PPU Region with descriptive comparative analysis. Secondly, the fruitfulness of minapolitan activity in PPU Region impact factors was identified by using internal and external factor (IFAS and EFAS) analysis. Then some of strategic considerations was formulated by using the successful development indicator in minapolitan area that associate to the blue economy concept with SWOT analysis. The result of IFAS analysis show the highest score of strength that is production and commodity productivity. Contrarily, the income level factor is become the highest score at weakness. Then, the EFAS analysis declare that marketing system is the highest factor in opportunity. The position of SWOT quadrant indicate that the minapolitan area of PPU region is in quadrant I /or first quadrant which means progressive. Therefore, the minapolitan in PPU have a great chance to increase the cultivation optimally. The results of SWOT matrix is to increase its product and productivity by upgrading the quality and quantity production facilities, raising the control of production activites and also increasing the supervision of processing business with sustainable management business principle.

Keywords: Minapolitan; Penajam Paser Utara; Blue Economy

1. Introduction

Penajam Paser Utara (PPU) Region in East Kalimantan was assigned as one of minapolitan area in Indonesia focusing on aquaculture based on Indonesia Ministry of Maritime Affairs and Fisheries Decision Number 35 in 2013. Unfortunately, it is shown from PPU region statistics data that decreasing fisheries production in PPU region was occur especially for land fisheries from 2013 until 2015. The aim of this study is to formulate development strategies of minapolitan in PPU Region by the Blue Economy concept.

2. Methods

Several variables such as fisheries and aquaculture aspects, processing and marketing, incomes and workers, also sustainability and economic paradigm is evaluated in this study. Firstly it needs to identify the potential of character and problem by reviewing minapolitan area in PPU Region with descriptive comparative analysis. Secondly, the fruitfulness of minapolitan activity in PPU Region impact factors was identified by using internal and external factor (IFAS and EFAS) analysis. Then some of strategic considerations was formulated by using the successful development indicator in minapolitan area that associate to the blue economy concept with SWOT analysis.

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3. Results

Several data that used to analyze and identifying characteristics of each factor are production realization data of sea and land fishery commodities in 2015, development and requirement data for supporting Minapolitan infrastructure, expansion support data for production systems and fishery farmers in PPU district, the data of procurement assistance for the community in 2015, the amount of marine fisheries and inland farmers data in PPU district in 2015, the diversity data of inland fisheries farmers in PPU district, data of poor families in PPU district in 2012, data about fishing gear and ownership of boats quantity in PPU district 2015, primary survey through direct observation in supporting infrastructure such as the Port Fish facilities (TPI) as well as an interview with Mr. Roni Tuska (Department of Marine and Fisheries) about infrastructure, accessibility, harvesting system, abrasion disaster potential and irrigation systems.

Through a comparative descriptive analysis by comparing the existing condition of the field either by primary or secondary data, the identity of each factor obtained in this study are:

Table 1. Influential Factors in Minapolitan Success with Blue Economy Principles in the District PPU

Aspect	Factor	Identity	Remarks
Fisheries and aquaculture	Production And Productivity of Superior Commodity	S1	High fisheries production in PPU district is a strength point for activity in PPU Minapolitan
	Multiplier Effect	O1	Minapolitan activities resulted in a positive impact for the economy in PPU district
	Quality of production facilities	W1	The condition of supporting facilities and accessibility is still less than optimal in its development
	Development of Cultivation Systems	S4	Have planned an integration between upstream development system in Babulu District, with downstream system in Penajam, Waru and Sepaku District
	Management Quality	W2	The need for oversight and management activities that deal with the conditions of service in the port of fish (TPI) as the unit of management-related outcomes, inputs and processes.
	Port Development	W3	Analyzing the condition of port infrastructure and fishery activities which are still not optimal
Processing and marketing	Production, productivity, and result value	O4	PPU district have a variety of community activities unit such as home industries that process fishery products and aquaculture
	Quality and diversity of UMKM products	S2	fish processing results are quite varied and the quality is good enough
	Amount of Processing Business	W4	the number of processing business in PPU District still not increased especially UMKM process for fishery products
	Marketing System	O5	able to penetrate the regional market to Banjarmasin, Samarinda and Java.
	Business Development System	O6	there is a commitment between local government and fishery farmer, in the form of financial contributions, personnel, and facilities management and development in the Minapolitan region
Income and employment	Business Opportunities And Employment	O7	high business opportunities and employment in PPU District
	Public Welfare	W5	The level of welfare is still low, especially in fulfilling health and education facilities
	Income Level	W6	The level of income is still inadequate, judging from the large number of poor people in PPU District
Sustainability	Natural Efficiency	S3	How to harvest and tools that used are still traditional and harmless to the environment
	Pollution Free	T1	Lack of community commitment to waste-free fishery production
Economic paradigm	Ecosystem	O8	Fishermen pay attention to cycles of natural ecosystems
	Business Method	T2	Product innovation has not been developed with optimal production systems and management

Table 2. Internal Factor Analysis Summary (IFAS)

Identity	Factor	Weight	Score	Total Score
Strength				
S1	Production and productivity of superior commodity	0,15	4	0,6
S2	Quality and diversity of UMKM products	0,15	3	0,45

Identity	Factor	Weight	Score	Total Score
S3	Natural efficiency	0,1	4	0,4
S4	Development of cultivation system	0,1	3	0,3
	Jumlah	0,5		1,75
Weakness				
W1	Management quality	0,05	-2	-0,1
W2	Development of harbor	0,05	-2	-0,1
W3	Amount of processing business	0,15	-4	-0,6
W4	People welfare	0,1	-3	-0,3
W5	Income level	0,15	-4	-0,6
	Sum	0,5		-1,7
	Total	1		0,05

Then, the EFAS analysis declare that marketing system is the highest factor in opportunity.

Table 3. External Factor Analysis Summary (EFAS)

Identity	Factor	Weight	Score	Total Score
Opportunity				
O1	Multiplier effect	0,1	3	0,3
O2	Quality of production facilities	0,1	4	0,4
O3	Production, productivity, and result value	0,15	4	0,6
O4	Marketing system	0,15	4	0,6
O5	Business development system	0,05	3	0,15
O6	Business opportunity and employment	0,1	3	0,3
O7	Ecosystem	0,1	4	0,4
	Sum	0,85		2,75
Threat				
T1	Free pollution	0,075	-3	-0,225
T2	Business method	0,075	-3	-0,225
	Sum	0,15		-0,45
	Total	1		2,3

The position of SWOT quadrant indicate that the minapolitan area of PPU region is in quadrant I /or first quadrant which means progressive. Therefore, the minapolitan in PPU have a great chance to increase the cultivation optimally.

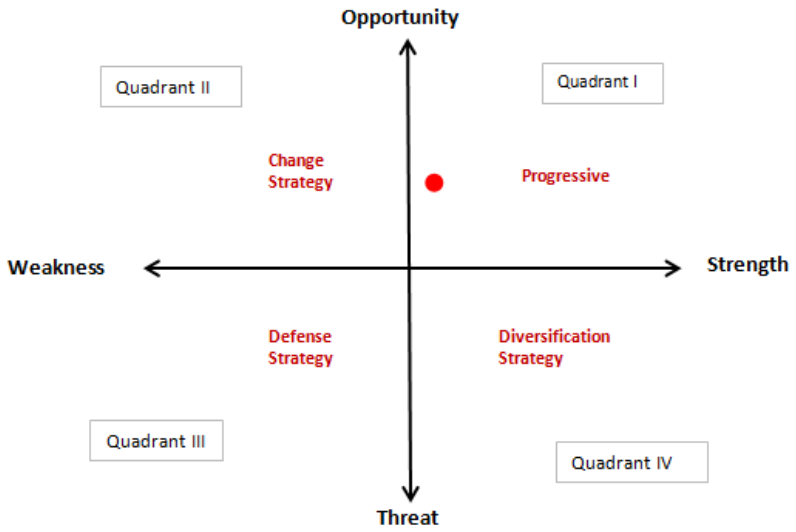

Fig. 1. (a) SWOT Quadrant

Then the SWOT matrix analysis results are :

Table 3. SWOT Matrix Analysis

IFAS / EFAS	**Strength (S)** 1. Production and productivity of superior commodity 2. Quality and diversity of UMKM products 3. Natural efficiency 4. Development of cultivation system	**Weakness (W)** 1. Management quality 2. Development of harbor 3. Amount of processing business 4. People welfare 5. Income level
Opportunity (O) 1. Multiplier effect 2. Quality of production facilities 3. Production, productivity, and result value 4. Marketing system 5. Business development system 6. Business opportunity and employment 7. Ecosystem	1. increase its product and productivity by upgrading the quality and quantity production facilities 2. product diversification for marketing system development 3. preserving environmentally friendly harvest system 4. increase the system cultivation to enhance business opportunity	1. raising the control of production activities 2. infrastructure development as effort to increasing the multiplier effect 3. increasing the unit process with raising supervision by the government 4. Raising income level and wealth by increase the opportunity business and employment absorption in community
Threat (T) 1. Free Pollution 2. Business Method	1. increasing the supervision of processing business with sustainable management business principle	1. increasing the amount of production facilities with sustainable business management principle should be applied

4. Conclusion

Increasing Minapolitan development strategies in Penajam Paser Utara (PPU) Region using blue economy concept could be realized by increasing its product and productivity by upgrading the quality and quantity production facilities, product diversification for marketing system development, preserving environmentally friendly harvest system, increase the system cultivation to enhance business opportunity. Other strategies that resulted from this study is raising the control of production activities, infrastructure development as effort to increasing the multiplier effect, increasing the unit process with raising supervision by the government, raising income level and wealth by increase the opportunity business and employment absorption in community. And finally, increasing the supervision of processing business and the amount of production facilities with sustainable management business principle should be applied.

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Spatial Potential Analysis of Coconut Farm as A New Ecotourism Attraction in Subagan Village Using GIS

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Abstract

Subagan Village has well-known as a tourism destination in Bali Province. That fact is strenghten by an achievement that given to the Subagan Village as the 1st winner of National Tourism village Award in 2013. Tourism in Subagan village only explores marine sector, whereas this village has a narrow shore because a massive abration. Massive abration in this area makes marine-based tourism not sustainable for tourism development in this area. Subagan village need more attraction to sustain the tourism development in this village. Central Bureau of Statistics (BPS), shows that coconut farmer is a major occupation in the Subagan Village. Beside that, coconut is a major commodity in this area. Although Subagan Village has been developing community-based tourism, but as a major sector, coconut farm hasn't included in Subagan tourism package yet. Based on this fact, coconut farm is potential to be a new attraction in Subagan village. This new attraction, then, can be packaged as an ecotourism and balancing tourism development not only in shore area, but in the whole area of the village. This research conducted to analyze the potential of coconut farm to be a new attraction in an attempt to develop ecotourism in Subagan Village. This research used spatial analysis using Geographycal Information System to describe potential and planning ecotourism in Subagan Village. The result of this study is expected to be a reference and recommendation for local government and tourism developers in Subagan Village.

Keywords: *Coconut Farm , Ecotourism , Geograohical Information System ,Subagan Village*

1. Introduction

Subagan Village has well-known as a tourism destination in Bali Province. That fact is strenghten by an achievement that given to the Subagan Village as the 1st winner of National Tourism village Award in 2013.. Subagan Village has two major potential consist of marine sector and coconut farm . Central Bureau of Statistics (BPS), shows that coconut farmer is a major occupation in the Subagan Village. Beside that, coconut is a major commodity in this area. Although Subagan Village has been developing community-based tourism, but as a major sector, coconut farm hasn't included in Subagan tourism package yet.Tourism in Subagan village only explores marine sector, whereas this village has a narrow shore because a massive abration. Massive abration in this area makes marine-based tourism not sustainable for tourism development in this area.. Sustainable Tourism development can be achieve by implementing ecotourism in Subagan Village

Ecotourism is an alternative type of tourism. This term first known in late 1980s as a direct result of world acknowledgement and reaction to sustainable practices and global ecological practices (Diamantis, 1999). Also, as a reaction from the increasing of "mass tourism". So, ecoutourism were created to alternate and decrease the negative impact of that [2]. Firstly, ecotourism was introduced by Hector Ceballos-Lascurain with the definition "...travelling to relatively undisturbed or uncontaminated natural areaswith the specific objective of studying, admiring, and enjoying the scenery and its wild plants and animals, as well as any existing cultural manifestations (both past and present) found in these areas" [1]. Based on this fact, coconut farm is potential to be a new attraction in Subagan village. This new attraction, then, can be packaged in an ecotourism project in this area . Coconut plantation potential doesn't only limited on attraction,but can also help shore conservation. Coconut plantation can reduce abration impact on shore

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area,so tourism development can be distribute in all area.This concept can be managed by designing ecotourism package based on spatial analysis. , Spatial analysis needed to prevent negative impact on environment.

Nowaday spatial analyst can be done using Geographical Information System (GIS). GIS methods is suitable for tourism package design, because it can integrate many kind of data weather from statistic ,vector even raster to provide a new information about spatial relation in study area. GIS technology offers great opportunities for the development of modern tourism applications using maps. This technology integrates common database operations such as query with the unique visualization and geographic analysis benefits offered by maps. The integration of tourism data and GIS data is a big challenge for the tourism industry (Jovanovic,2008). Example of GIS implement for tourism is on attraction potential assesment . In ecotourism case, GIS methods can be used to extracting social and physical information of study area to prevent unbalance use of area potential. Spatial relation information can also projecting bad impact of development, so the impact can be reduced by adjust development design based on analysis result. This research conducted to analyze the potential of coconut farm to be a new attraction in an attempt to develop ecotourism in Subagan Village. The result of this study is expected to be a reference and recommendation for local government and tourism developers in Subagan Village.

2. Methods

This research using secondary data from some digital map consisted of hypsography map,land use map,network line map,and administration map. All digital map then processed using Geographical Information system methods to analyse spatial relation between physical and social potential in study area. Analyse process used some tools in software ArcMap 10.2 such as clip tools and buffer tools . After processed, then all the data was overlayed to combine all information in one map. Information that extraxted from overlay technique are area accessibility,landuse distribution, and potential attraction distribution. Those parameters then consider to show the most potential space and the potential route for ecotourism package in Subagan Village.

3. Results

After all the data was analysed using some tools in GIS (Geographic Information System), the result is coconut farm has potention to be attraction in Subagan Village. Result can be seen after interpete proportion of land use in Subagan Land Used map (figure 1). With update data from recent land used, it definitely expose that coconut farm, is the dominant land use in Subagan. This conclusion support by fact, that most of Subagan villagers is a farmer.

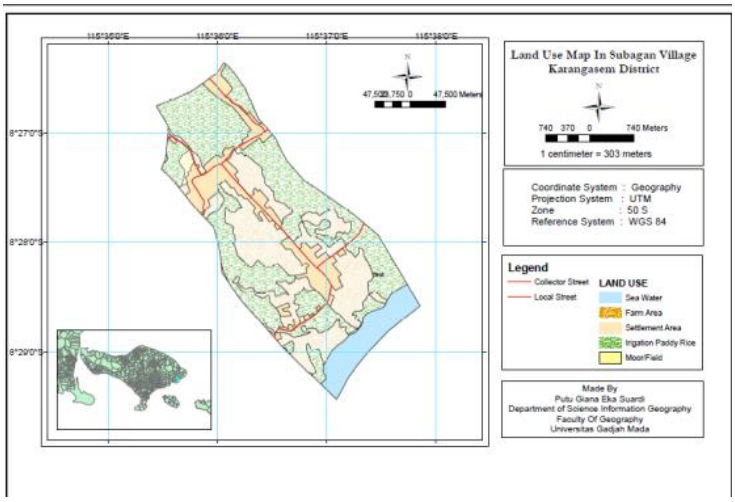

Figure 1. Land Use Map

Before potential developing into new tourism package, there must be assessment through it. There are some parameter to classify potential attraction availability to develop. One of the parameter is accessibility. Accessibility of coconut farm, can be analysed using buffer tools. With buffer tools, we can classify attraction accessibility. On this research, we used 500 M and 1 Km distance. After the data was processed, data represent using buffer map. Buffer cover is measured from collector street. Collector street was used as buffer base, because tourist transportation usually

passes by collector strret.Both of buffer map show that all the coconut farm can be reach in 1 kilometer maximum from collector street. Beside that,around coconut farm there are two street network consist of local and collector street. Those map show that coconut farm has good accessibility.Buffer map can be seen on figure 2 and figure 3.. The second parameters can be seen is distribution landuse especially settlement area . Settlement area located near the collector street and in the middle of coconut farm. This settlement can be used to provide accommodation such as homestay.Based on spatial analysis, ecotourism design in Subagan Village offer coconut farm journey as major attraction. Activity that offered in this package included tracking in coconut farm, harvesting coconut with farmer,learning coconut product processing and enjoy coconut product while seeing beautiful scenery from jasri beach. Meanwhile, the optimum package route start from northern collector street then head towards local street as tracking route while doing many activity with farmers, then enter coconut product factory that located in the middle of route and finish in the beach. Beside route design, ecotourism package can also integrated with cottage and villa owner to provide accommodation alternative beside homestay.

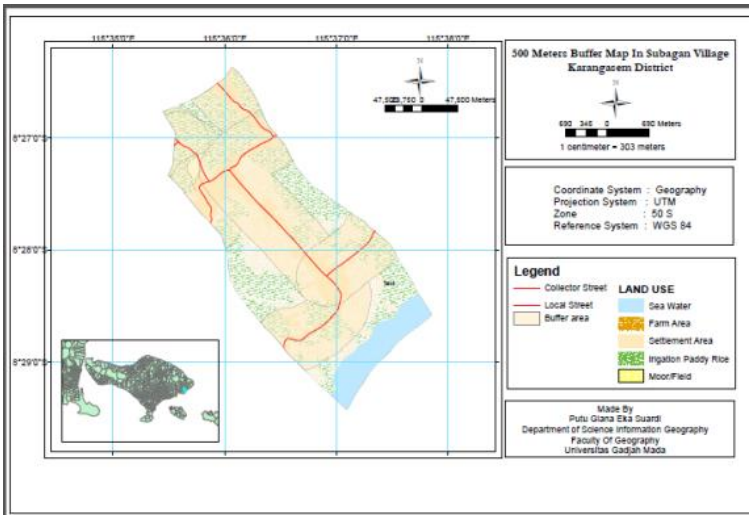

Figure 2 . 500 Buffer Map

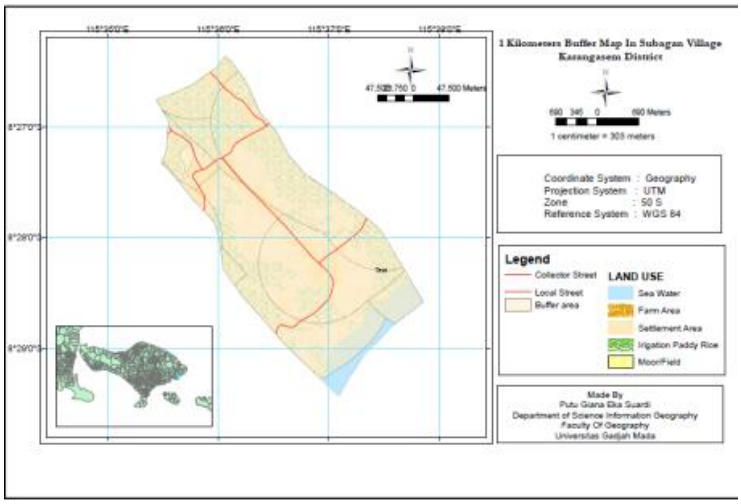

Figure 3.1 Km Buffer Map

4. Result

Coconut farm is potential attraction in Subagan village. It can be seen from the dominant land use in Subagan Land use Map. Beside that, based on buffer analysis, all the coconut farm can be reached within 1 Km.With those land use and good accessibility, coconut farm can be developed as main attraction in ecotourism package of Subagan Village.

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Study of Government Policy to Improve Rural Infrastructure Development

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Abstract

Infrastructure is the physical systems that provide transportation, irrigation, drainage, buildings and other public facilities, which are required to meet basic human needs both social needs and economic needs (Grigg, 1988).[1] Infrastructure development is the basic thing that must be met to support the advancement of a region, as well as for the progress and independence of the rural. Infrastructure development has a real multiplier effect for the rural, either in the form of increased welfare, health, also the quality of human resources. However, in its application fulfillment rural infrastructure is still far from the expected. So what happens is the greater disparities between urban and rural areas. The ruralrs are not able to compete to improve their welfare.
Infrastructure development is strongly influenced by the policies made by the government. But as is known there has been no significant change to the lives of the ruralrs. Therefore, it would need to assess government policy related to rural development. Especially in terms of whether government policy has been to support and promote the development of rural infrastructure. And whether the existing policy has guaranteed the development of rural infrastructure.

Keywords : rural, policy, infrastructure development

1. Introduction

It has been supposed that the rural used as centers of development, in addition to turning the wheels of the economy as well as measures to reduce the rate of urbanization. Rural development needs to get more attention from the government because the rural still has a lot of potential that has not been used optimally. The ruralrs desperately need a variety of access infrastructure to support its various activities.

Infrastructure is the physical systems that provide transportation, irrigation, drainage, buildings and other public facilities, which are required to meet basic human needs both social needs and economic needs [1]. Infrastructure development is the basic thing that must be met to support the advancement of a region, as well as for the progress and independence of the rural. Infrastructure development has a real multiplier effect for the rural, either in the form of increased welfare, health, also the quality of human resources. However, in its application fulfillment rural infrastructure is still far from the expected. So what happens is the greater disparities between urban and rural areas. The ruralrs are not able to compete to improve their welfare.

Infrastructure development is strongly influenced by the policies made by the government. But as is known there has been no significant change to the lives of the ruralrs. Therefore, it would need to assess government policy related to rural development. Especially in terms of whether government policy has been to support and promote the development of rural infrastructure. And whether the existing policy has guaranteed the development of rural infrastructure.

2. Research Methodology

The method used in this study is a qualitative method, according to Guba Gogdan and qualitative approach is procedure research that produces descriptive data (data collected in the form of words, pictures, and not numbers). Analysis technique used is content analysis. According Krippendorff [2], content analysis is a research technique for making inferences that can be replicated (duplicated) and valid data, having regard to the context. According to Riffe,

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Lacy, and Fico [3], content analysis is testing a systematic and replicable of the symbols of communication, where this symbol is given a numerical value based on a valid measurement and analysis using statistical methods to describe the content of the communication, draw conclusions and provide context, either production or consumption. Content analysis is a technique used to draw a conclusion by finding the message that objectively and systematically. [4]. As a technique of research, content analysis has its own approach in analyzing the data. This approach is not as directly observing the behavior of people or interviewing people, but the researchers took communications or data that has been generated and asking questions about its communication [)[5].

Meanwhile, according to [6], content analysis is useful to obtain information from communications content delivered in the form of the symbol. The data used in the form of secondary data consists of material in the form of legislation the government policy on rural areas. Policies are assessed primarily related policies rurals, Act 6 of 2014 on the rural and its derivatives policy. In addition, relevant policies rurals that have been there before. The data that has been collected do content analysis.

Population for content analysis in this study were all Indonesian government policy related to rural governance and development. In this case the processing of information concerning the contents of communication that has made categorization, put in a frequency table and then analyzed according to frequency of occurrence which is then interpreted and compared. The analysis was done qualitatively. Meanwhile it is also analyzed using qualitative descriptive methods used to sharpen the analysis of the frequency of the appearance of the rural infrastructure development in accordance categorization has been made.

3. Results

In the development of policies regarding the setting of the village, there are some policies that have been previously issued such as:

- Undang-Undang Nomor 22 Tahun 1948 tentang Penetapan Aturan-Aturan Pokok Mengenai Pemerintahan Sendiri Di Daerah-Daerah Yang Berhak Mengatur Dan Mengurus Rumah Tangganya Sendiri[7]; Undang-Undang Nomor 1 Tahun 1957 tentang Pokok-Pokok Pemerintahan Daerah[8]; Undang-Undang Nomor 18 Tahun 1965 tentang Pokok-Pokok Pemerintahan Daerah[9]; Undang-Undang Nomor 19 Tahun 1965 tentang Desa Praja Sebagai Bentuk Peralihan Untuk Mempercepat Terwujudnya Daerah Tingkat III di Seluruh Wilayah Republik Indonesia[10]; Undang-Undang Nomor 5 Tahun 1974 tentang Pokok-Pokok Pemerintahan di Daerah[11].
  This policy only explained that the village has the right to organize and manage their own household. Not to set the priorities for rural infrastructure development and have not yet described the village finances.
- Undang-Undang Nomor 5 Tahun 1979 tentang Pemerintahan Desa[12]
  This policy is explained that the village has the right to organize and manage their own household. While the village is a source of income:
  1) Revenue native village itself consists of:
     - The gain of saving village lands;
     - Gains of self-help and participation of village communities;
     - The gain of mutual help;
     - Others gain from the village of legitimate businesses..
  2) Revenue derived from the provision of Government and Local Government consisting of:
     - Donations and government assistance;
     - Donations and the help of Local Government;
     - A portion of the taxes and charges granted to Rural Areas.
  3) Other legitimate income
- Undang-Undang Nomor 22 Tahun 1999 tentang Pemerintahan Daerah[13]
  This policy is explained that the village has the right to organize and manage their own household. While the village is a source of income:
  1) Revenue native village itself consists of:
     - Gains of rural enterprises;
     - Gains wealth of the village;
     - The gains of self-help and participation;
     - The gains of mutual cooperation;
     - Other revenue village legitimate..
  2) Help the district government that includes:
     - Part of the recovery of taxes and levies; and
     - Part of the financial balance of central and local governments receive district;

3) Help from the government and provincial government;
4) Contribution from third parties;
5) Loans village

- Undang-Undang Nomor 32 Tahun 2004 tentang Pemerintah Daerah[14].
  This policy is explained that the village has the right to organize and manage their own household. While the village is a source of income:
  1) Revenue native village;
  2) The revenue share of local taxes and levies districts / cities;
  3) Part of the financial balance of central and local received by the district / city;
  4) Assistance from the Government, provincial government and district / city governments;
  5) Grants and donations from third parties.

These policies tend to position the village with the duty of assistance to the government on it. The village is less given the opportunity to manage the region, especially in terms of funding which in fact is the main source for the development of rural infrastructure.

- Undang-Undang No.6 Tahun 2014 Tentang Desa[15]
  This policy is the first legislation regulating the village in particular. Here was assigned that the income derived from the Village:
  1) Revenue native village consists of the results of operations, assets, self-help and participation, mutual aid, and other income of the original village;
  2) Allocation of Revenue and Expenditure;
  3) Part of the results of local taxes and levies Regency / City;
  4) The allocation of village funds that are part of the balance funds received by Regency / City;
  5) Financial assistance from the Budget of the Provincial and Budget of the Regency / City;
  6) Grants and donations are not binding on third parties; and
  7) Other income legitimate Village.

The budget allocation as referred to above is sourced from the Shopping Centre to streamline the program based on the village equally and equitably. The results section of local taxes and levies Regency / City as meant at least 10% (ten percent) of taxes and levies. The village fund allocation referred to at least 10% (ten percent) of the balance funds received by District / Municipal Budget Revenue and Expenditure after deduction of Special Allocation Fund. For Regency / City did not leave the village fund allocation as set forth above, the Government may delay and / or a cut of the allocation of the balance funds after deducting the Special Allocation Fund should be channeled to the village. Priorities, programs, activities and needs of Rural Development was formulated based on the assessment of the needs of the village community which includes:

- Improving the quality of and access to basic services;
- Development and maintenance of infrastructure and environment based on technical capabilities and local resources that are available;
- The development of large-scale productive agricultural economy;
- Development and utilization of appropriate technology for economic progress; and
- Improving the quality of public order and tranquility of the village based on community needs Villages

In addition to the allocation of funds for the village is clarified, in this policy has also been directed to rural development priorities to meet the needs of basic infrastructure in the village. This is a stimulus for the village to begin moving to build their respective regions. Meet the needs of basic infrastructure as a driver of the economy. However, of course this all depends on the ability of human resources in the village is able to carry out or not. So here are still needed guidance-guidance from the central government / provinces / districts to prepare human resources in managing the village with properly. It also calls for proper evaluation and monitoring to ensure fast and rural development is done right on target.

4. Conclusion

Rural infrastructure development in Indonesia has become quite alarming to see more and huge disparities in rural and urban development. But with the policy of the Act No. 6 In 2014 the expected development of infrastructure in the village can be encouraged to catch up. But keep in mind related to the amount of funds allocated to the village annually coaching village officials as the manager of the village as well as strict controls over the use of funds for rural development. So expect no abuses occur which will harm the village itself. Needs be prepared supervisory mechanism targeted and easy to apply.

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Sustainable Pro-Poor Tourism: Channeling Urban Modernity to Eco-Cultural Based Kampong-Tour Development in Indonesia

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Abstract

Sustainable urban planning and development requires not only a fast-growing economic growth and modernity, but also social equity and environmental sustainability. Meanwhile, the global goals of sustainable development have fascinatingly set a promising urban development future by enhancing ecology based pro-poor policy program. Apparently, pro-poor development agenda has led to the notion of pro-poor tourism as part of urban development strategies on poverty alleviation. This research presents *Jakarta Hidden Tour* and *Kampong Warna-warni* as certain cases of pro-poor tourism in Indonesia. By the emergence of criticism on "pro-growth" paradigm, the critical analysis of this research focuses on the scenario of sustainable pro-poor tourism through eco-cultural based Kampong-Tour development. In accordance, debates and dilemma have been continuously arising as pros and cons regarding the ethical issues of poverty alleviation based Kampong-Tour development. Nevertheless, this paper tries to redefine Slum Kampong as potential; the writer wildly offers a concept of poverty alleviation by reinventing pro-poor tourism strategy; revitalizing slum site to eco-cultural based pro-poor tourism development as an embodiment of a sustainable urban development. By holding *system thinking* analysis as research method, sustainable pro-poor tourism highlights the urgency community based tourism and eco-tourism so that poverty alleviation based tourism can be tangibly perceived by the poor. In this sense, good local governance and public private partnership must be enhanced, it is due to, like any other development projects; sustainable pro-poor tourism needs a strong political commitment to alleviate urban poverty, as well as to pursue a better future of sustainable nation.

Keywords: Urban Poverty; Pro-poor Tourism; Eco-Tourism; Community based Tourism; Sustainable Development; Good Local Governance; Public Private Partnership; Kampong-Tour Development.

1. Introduction

In the era of uncertainty, Indonesia, as well as the developing nations in Asia is facing two major urban development problems which are poverty and environmental degradation. Indonesia has witnessed a transformational process associated with the drastic changes in economic stability, socio-cultural spheres, administrative and political reform, and environmental quality. In this context, poverty alleviation has become the leading agenda of international development which highly supported by the global deal of Sustainable Development Goals (SDGs). Tourism sector is evaluated as effective locomotive for development. Furthermore, this sector – one of vital parts of development strategies has increasingly catalysed the growth national income. In addition, due to a globalising and fast-changing world, tourism for the poor meets the need of sustainable urban development in the framework of pro-poor policy. It needs to be noted that, in many cases, urban poverty has gained massive popularity due to the dynamic impacts on the dimensions of economy, socio-culture, politic, and ecology. Moreover, the complexity of urban poverty has turned pro-poor policy into a more creative poverty reduction strategy through pro-poor tourism. Indeed, the connection between pro-poor tourism and Pro-poor policy is close; as a means of poverty alleviation, Pro-poor policy has been massively set to overcome the problem of urban poverty – which commonly caused by socio-economy disparity.

Indonesia has experienced pro-poor tourism in some different programs. Jakarta Hidden Tour is one "wild" form of pro-poor tourism developed by private sector. The concept of tourism highlights the idea of social critics on disproportional urban development in the capital city. The attraction ultimately bases on the uniqueness of urban poverty to be exposed as tourism object. Kampong Warna-warni in Malang is another type of pro-poor tourism inspired by Santa Martha and "Favela Painting" in Rio de Janeiro, Brazil. In the perspective of sustainable pro-poor tourism, these types of pro-poor tourism are expected to give economic benefits to the poor and maintain sustainability through community empowerment. Thus, the creation of tourism activities should be managed by social capital of each area. Besides, the uniqueness of each Kampong must be local values of the tourism site. This research is

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conducted to display comprehensive analysis of pro-poor tourism in Indonesia which sample cases in Jakarta and Malang. The research focuses and problems emphasized on: 1) conceptual analysis of pro-poor tourism and pro-poor policy; 2) theoretical analysis of pro-poor tourism in the perspectives of modernization theory and dependency (critical) theory; and theoretical view from alternative tourism perspective (sustainable development); 3) comparative analysis on pro-poor tourism in Jakarta and Malang (force field analysis); 4) scenario analysis on the establishment of sustainable pro-poor tourism through Eco-cultural based Thematic Kampong-Tour Development (Causal Loop Diagram, including the input-output diagram). A methodological guideline in this research is qualitative approach and specified into the framework of system thinking analysis as the research method. Qualitatively, system thinking can be used to capture the workings of a system as a tool of thinking and understanding (Prasetyanti, Wijaya, and Muluk, 2012: 3). System thinking framework is also be used as technical guideline to describe and define the complex process and transformation of sustainable pro-poor tourism with various influencing factors.

2. Results

The rising of modernity; the interconnected developed and developing nations; and the linkage of global tourism and international development agendas are the significant points of the theory of Modernization (the liberal perspective) and the theory of dependency (the critical perspective). Liberal perspective views modernization paradigm as the best means to achieve the betterment of development in developing countries. Modernization defines development process as an evolutionary of traditional society to a more modern community. Modernization theory believes that international assistance may contribute to realize the "modern" way of life for the poor by embedding sharing on pro-poor tourism development. In short, the direction of development in peripheral nations relies on the international relationship between the developed and developing countries. This poor reality was demonstrated by the theory of dependency which sees pro-poor tourism as a product of liberalization which cannot provide instant answer to development. This strategy precisely has impacts on the environmental sustainability because the main goal of pro-poor tourism is "pro-growth" development for the poor. As a consequence of the era of sustainability, alternative tourism perspective came out to fulfill the empty link to sustainability in tourism. Alternative tourism can be defined as forms of tourism that set out to be consistent with natural, social, and community values and which allow both hosts and guests to enjoy positive and worthwhile interaction and shared experiences (Newsome, et. al., 2002). This theoretical reference somehow strengthened the development of the renewed interest of sustainable pro-poor tourism.

2.1 Sustainable Pro-poor Tourism based Urban Development

Urban poverty persistently became major concern of urban development due to its consistency of growing. Poverty rate increases per year along with population growth. In 2015, urban poverty reached 8,22%, it increased to 10,34% in 2016. Meanwhile, rural poverty reached 14,11% in 2015 and significantly increased to 17,67% in 2016. The uncontrolled inputs of urbanization risk the urban stability including the emergence of slum settlement; beggar, illegal street vendors, and unemployment for most of comers are poor. By the fact of fast-growing urbanization rate, the imbalance of population growth in urban and rural area caused unequal portion of urban spatial development (the unbalanced growth theory) which critically can affect urban sustainability. Therefore, the urgency of sustainable pro-poor tourism based poverty alleviation is very demanding (detail identification of sustainable pro-poor tourism is briefly explained below):

Table 1. Analysis on Pro-poor Tourism and Sustainable Pro-poor Tourism

a. Pro-poor Tourism DOES NOT	b. Pro-poor Tourism DOES	c. Sustainable Pro-poor Tourism
anti-capitalist	focus on incorporating the poor into capitalist markets by increasing job and entrepreneurial opportunities and collective benefits. Like fair trade, it is a form of market intervention, which relies heavily on the private sector	enforces the spirit of Ecocracy (the sovereignty of environment): putting ecology as a core part of governance system
separate from wider tourism systems	depend on existing tourism structures and markets	proposes Ecofeminism
a theory or model	orientates research to the net benefits from tourism that can or could accrue to the poor	promotes local arts and cultures
a niche type of tourism	apply to any kind or type of tourism, including large and small-scale tourism, even if the non-poor also benefit. Can be from regional or	applies the spirit of Green Economy

a. Pro-poor Tourism DOES NOT	b. Pro-poor Tourism DOES	c. Sustainable Pro-poor Tourism
	national policies or private sector involvement	
specific method	use numerous methods, none of which are specific to PPT, including value chain analysis, to collect data and show how the poor are and can be further involved in tourism	balances Economy, Eco-culture, and Empowerment (3E)
only about the poor	recognize that the non-poor may also benefit from tourism, even disproportionately. It is less concerned with the relative than the absolute (net) benefits received by the poor	introduces Poor Public Partnership and Poor Private Partnership: this indicates that poor people can help to provide solution for themselves
just about hunger and no/ inadequate incomes	have a broad definition of poverty, including lack of freedom, opportunity, power, skills, and education. It is about development.	redefines the meaning of tourism: a way to share life experience and build empathy
only about individual benefits	focus on community benefits; water, sanitation, health, education, infrastructure, etc.	bridging social gaps
only for those occupying the "moral high ground"	require wide stakeholder cooperation and commitment, including national and local authorities, planners, the private sectors, etc; ideally combining to ensure the poor benefit from tourism	dd.

Source: Modified and analysed by writer (2017); adopted from Harrison (2008: 856)

Case Studies: Pilot Projects in Jakarta (Jakarta Hidden Tour) and Malang, East Java ("Kampong Warna-warni")

Table 2. Comparative Force Field Analysis of Kampong-Tour Development

Jakarta Hidden Tour		Kampong Warna-warni	
Driving Forces	Score	Driving Forces	Score
Uniqueness	2 (sufficient)	Political Support	2 (sufficient)
Marketing management	3 (average)	Access	3 (average)
City stories	4 (significant)	Private support	4 (significant)
Private support	5 (most significant)	Ecocracy Social capital	5 (most significant)
Restraining Forces	Score	Restraining Forces	Score
Ecocracy	5 (most significant)	Knowledge management	5 (most significant)
Political Support	4 (significant)	Public facility	4 (significant)
Public facility	3 (average)	Marketing management	3 (average)
Social capital	2 (sufficient)	Integrated empowerment system	2 (sufficient)

Source: Modified and analysed by writer (2017)

System thinking Analysis: The Scenario of Eco-cultural based Sustainable Kampong-Tour Development

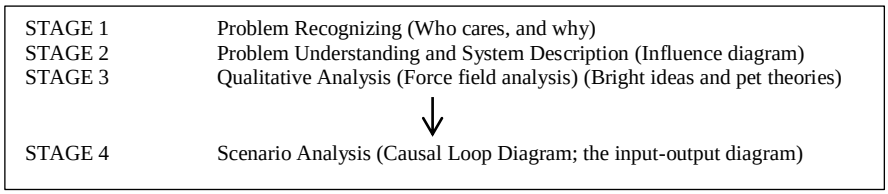

Figure 1. *System thinking* Analysis (Qualitative)
Source: Modified by the writer (2017), adopted from Coyle (1996, p.10-11)

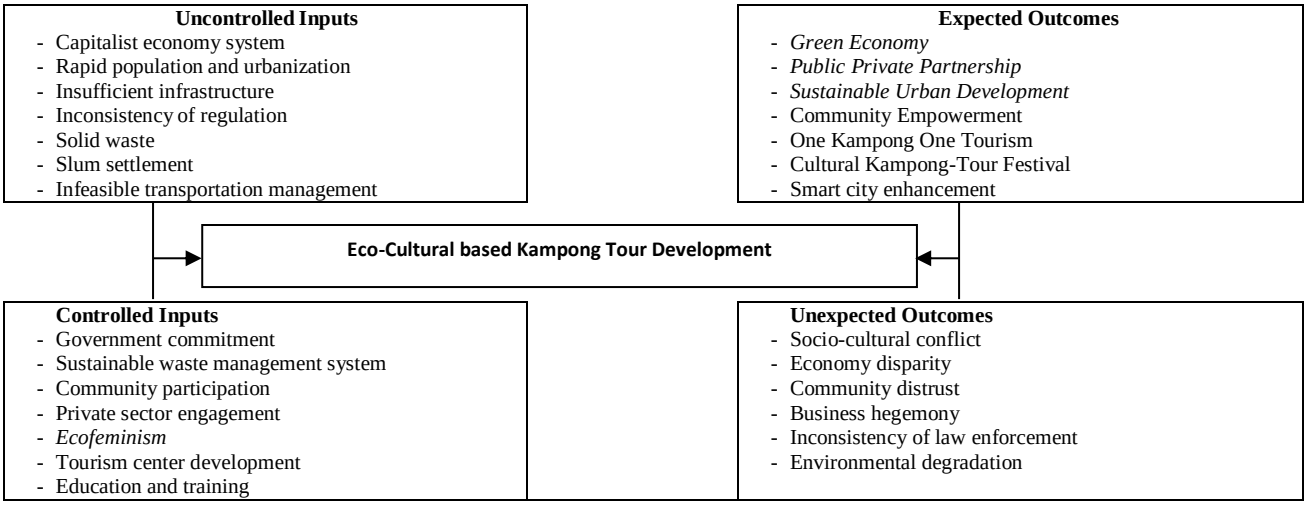

Figure 2. The Input-output Diagram
Source: Analyzed by writer (2017)

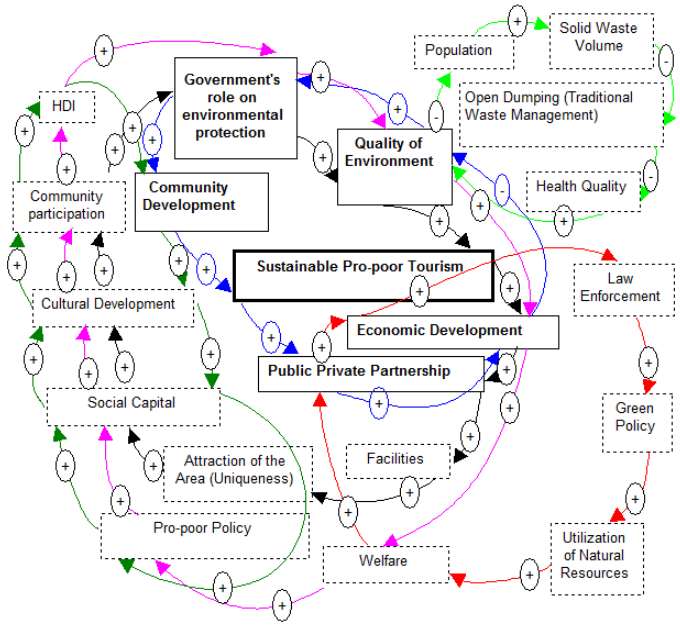

Figure 3. Causal Loop Diagram: Sustainable Pro-poor Tourism
Source: Powersim analysis by writer (2017)

3. Conclusion

Sustainable pro-poor tourism requires the balance of economy, eco-culture, and empowerment (3E) to succeed pro-poor policy program. Sustainable pro-poor tourism considered to be one of effective strategies of pro-poor policy to bridge socio-economy disparity and maintain eco-cultural development in urban area. The analysis of system thinking concludes that sustainable pro-poor tourism may combine community based tourism and eco-tourism. Practically, Kampong Warna-warni is recognized to be more sustainable than Jakarta Hidden Tour. The best supporting factors are social capital and Ecocracy. Direct impacts of Jakarta Hidden Tour are (still) very limited to simple education assistance for children; however Kampong Warna-warni has successfully developed significant benefits on economy and ecology. In summary, Good Local Governance and Public Private Partnership must be enhanced to gain more impacts on economy and cultural through community owned business development and Kampong-tour festival.

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The Perception of Visitors towards The Level of Satisfaction on Park (Case Study: Singha Merjosari Park Malang)

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Abstract

Public spaces are the most important element in the urban area, that aims to perform several activities. Park is one of the public spaces. It is used to get happines and comfort. Malang is the second largest city in East Java and one of the five cities that provide cleanest air in Asia (NGO CCAP research). The purpose of this study is to reveal how the visitor's perception of the comfort level at Singha Merjosari Park and also the desire of visitors of Singha Merjosari Park in the future. The approach method in this research is quantitative descriptive. The analysis technique used is Importance Performance Analysis (IPA) and Customer Satisfaction Index (CSI). Based on the results of IPA for Singha Merjosar Parki, what needs to get attention is the aesthetics of lighting, the cleanliness of the parking area and toilets, the shade in the park area, and the availability of clean water and based on the analysis of CSI is 65.30%. This means that visitors feel satisfied, but visitors are still not satisfied overall. Recommendations from these results are the aesthetics of lighting is expected to be more creative as well as their placement is set so that the area of the park becomes bright at night; the parking area is expected to be cleaned at least twice a day, while it is also expected that the broken toilet floor is fixed and the cleaning done regularly 2-3 times a week; the level of shade in the garden area is expected to get an addition of a shade plant in the park area (park area and parking area) evenly; and variable of utilities is the availability of clean water for 24 hours.

Keyword : Visitors, Perceptions, The level of Satisfaction, Park;

1. Introduction

The public spaces are important elements in the city that aims to perform several activities with specific interests to interact [1]. Meanwhile public space according to the Project for Public Spaces in New York in 1984, is a form of space used by human to perform several activities such as roads, pedestrian, parks, plazas and etc.

Park is a fenced plot of land which is used for fun, excitement, and comfort [2]. Meanwhile, according to [3], the park is a plot of land that is open for public with a certain area, in which there are trees, shrubs, bushes and grasses that can be combined with the creation of other materials. [4] states that the park is part of the public sphere that should be accessible to different kind of citizen.

Malang is a city and the second largest city in the East Java, Indonesia. It is located in the south of Surabaya with 90 km of distance. Malang area is 110.06 km^2 and divided into five districts. The population of Malang in late April 2016 reachs 887.443 people (Department of Population and Civil Registration - Malang). Population growth in Malang is about 1.58 percent each year. Malang is one of five cities that have the cleanest air in Asia. This result is released by research institute of non-government organization (NGO) and Cities Clean Air Partnership Program (CCAP). This award is a shared commitment between the government and all citizens of Malang to continue to preserve and beautify the face of Malang with the existence of parks.

Therefore, the assessment of the visitors perceptions is one way to see the level of comfort of the park. This assesment is done to improve the quality of the park. This study is conducted to answer the question "What is the level of comfort at Singha Merjosari Park?". The purpose of this study is to reveal how the visitor's perception of the comfort level at Singha Merjosari Park and also, visitors' desire to Singha Merjosari Park in the future.

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2. Methods

In this study, the method used is descriptive quantitative. The data collection methods used in this research that uses primary data is a questionnaire to the Singha Merjosari Park Malang visitors. The sampling technique used in this research is accidental sampling and the number of samples used is 100 respondents. The analysis technique used in this research is Importance Performance Analysis (IPA) and Costomer Satisfaction Index (CSI).

3. Results

Based on calculations using the IPA, the level of conformity is the result of a comparison between the level of visitors satisfaction (x) with the level of interest (y). Here is the table of average satisfaction and interest in Singha Merjosari Park Malang as follows:

Tabel 1.The average of satisfaction and interest in Singha Merjosari Park Malang

No.	Factors	Satisfaction		Interests		Weights (X)	Weights (Y)
		Value	Average	Value	Average		
1.	Aesthetics						
	Plants	381	3.8	430	4.3	0.05	0.05
	Supporting facilities – Lights	299	3.0	426	4.3	0.04	0.05
	Supporting facilities – Gazebo	368	3.7	436	4.4	0.05	0.05
2.	Cleanliness						
	Park Area	350	3.5	448	4.5	0.05	0.05
	Parking Area	304	3.0	430	4.3	0.04	0.05
	Trash can	341	3.4	444	4.4	0.05	0.05
	Toilet	274	2.7	423	4.2	0.04	0.05
3.	Security						
	Playground	346	3.5	424	4.2	0.05	0.04
	Activities in park area	367	3.7	420	4.2	0.05	0.04
	Parking area	338	3.4	422	4.2	0.05	0.04
4.	Circulation						
	The ease of access to park area	388	3.9	412	4.1	0.05	0.04
	The ease of surrounding park	390	3.9	410	4.1	0.05	0.04
	The ease of parking vehicles	368	3.7	417	4.2	0.05	0.05
5.	The Aroma						
	From waterways (ditch)	336	3.4	410	4.1	0.05	0.04
	Trash can	351	3.5	430	4.3	0.05	0.05
6.	Climate Regulator (Climatology)						
	The level of shade in park area	277	2.8	455	4.6	0.04	0.05
	The level of wind circulation in park area	368	3.7	408	4.1	0.05	0.04
	The facility to take shelter if it rains in park area	284	2.8	412	4.1	0.04	0.04
7.	Utility						
	Availability of wi-fi	175	1.8	342	3.4	0.03	0.04
	Availibilty of power sources	232	2.3	375	3.8	0.03	0.04
	Availibility of clean water	249	2.5	430	4.3	0.04	0.05
	Availibity of communication network (signal)	350	3.5	430	4.3	0.05	0.05
Total		7136	71.5	9234	92.4	1	1
Average			3.3		4.2		

From table 1 above shows the average of satisfaction and interest in Singha Merjosari Park in Malang. The result of calculation will be displayed in the form of Cartesian diagram, which in that diagram there are quadrants that contain about maintaining the achievements (quadrant), redundant (quadrant II), a low priority (quadrant III) and the main priority (quadrant IV). Here is the cartesian diagram Singha Merjosari Park Malang as follows:

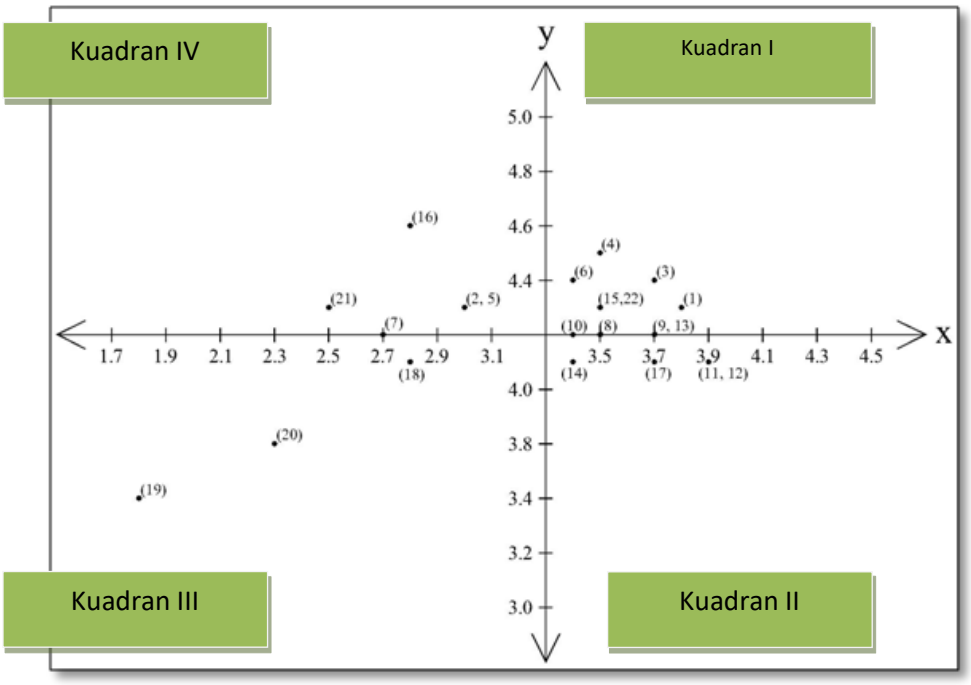

Fig. 1 Cartesian Diagram of Singha Merjosari Park Malang

Based on calculations using the method of IPA, the attributes that need to get attention are the factors that exist in quadrant IV. Factors contained in quadrant IV are considered important and in poor condition

Results of the index calculation of user satisfaction in Singha Merjosari Park Malang can be seen in Table 2.

Tabel 2. Index of Users Interests and Satisfaction

No.	Factors	Interests (I)	Satisfaction (P)	Score (S) (S) = (I) x (P)
		Skala 1 - 5	Skala 1 - 5	
1.	Aesthetics			
	Plants	4.3	3.8	16.34
	Supporting facilities – Lights	4.3	3.0	12.9
	Supporting facilities – Gazebo	4.4	3.7	16.28
2.	Cleanliness			
	Park Area	4.5	3.5	15.75
	Parking Area	4.3	3.0	12.90
	Trash can	4.4	3.4	14.96
	Toilet	4.2	2.7	11.34
3.	Security			
	Playground	4.2	3.5	14.70
	Activities in park area	4.2	3.7	15.54
	Parking area	4.2	3.4	14.28
4.	Circulation			
	The ease of access to park area	4.1	3.9	15.99
	The ease of surrounding park	4.1	3.9	15.99
	The ease of parking vehicles	4.2	3.7	15.54
5.	The aroma			
	From waterways (ditch)	4.1	3.4	13.94
	Trash can	4.3	3.5	15.05
6.	Climate regulator (Climatology)			
	The level of shade in park area	4.6	2.8	12.88
	The level of wind circulation in park area	4.1	3.7	15.17
	The facility to take shelter if it rains in park area	4.1	2.8	11.48

No.	Factors	Interests (I)	Satisfaction (P)	Score (S) (S) = (I) x (P)
		Skala 1 - 5	Skala 1 - 5	
7.	Utility			
	Availability of wi-fi	3.4	1.8	6.12
	Availibilty of power sources	3.8	2.3	8.74
	Availibility of clean water	4.3	2.5	10.75
	Availibity of communication network (signal)	4.3	3.5	15.05
	Total	Y = 92.4		T = 301.69

$$CSI = \frac{301.69}{5\ x\ 92.4} x100\% = 65{,}30\%$$

Based on the results of data processing and analysis can be concluded that the Singha Merjosari Park visitor satisfaction is in the good level, but visitors are still not satisfied overall. This is proven by the results of the CSI value which is 65.30%. For that, improvement is needed in order to increase visitor satisfaction.

4. Conclusion

Based on calculations using the IPA, there are attributes that need to get attention. It is the attributes contained in quadrant IV. Factors contained in quadrant IV are considered important and in poor condition. Based on the results of the analysis, it shows the attributes that need improvement and increase citizen satisfaction is aesthetic variables which include supporting facilities - lighting; variable of cleanliness which is parking area and toilet; variable of climate regulator which is the level of shade in the park area; and variable of utility which is the availability of clean water.

Based on the results of data processing and the analysis using Customer Satisfaction Index (CSI), it shows that visitor satisfaction towards Singha Merjosari Park Malang is in the good level, but visitors are still not satisfied overall. This is proven by the results of the CSI value is 65.30%. For that, improvement is needed in order to increase visitor satisfaction

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Community-Based Livelihood Management in Relations to Natural Disaster– A Study on Teknaf (coastal) Area of Bangladesh

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Abstract

Teknaf is an Upazila under Cox's Bazar District of Bangladesh, it's a coastal area with strong influenced by the Naaf river estuary of the Bay of Bengal. The study outlines the major livelihood groups or community in the area. It was observed that the livelihoods are severely affected by climatic and non-climatic changes. For example, the increased salinity of both soil and water has seriously affected all livelihood resources, in particular agriculture, fishery, livestock and forestry. The increase in frequency and intensity of natural disasters - floods and cyclones, has made it difficult for the local people to secure their livelihood. In addition to natural factors, several anthropogenic factors remain the major form of vulnerability for the farmers, fishers and other livelihood sections of the society. Due to a large portion of land lying fallow, the wage laborers face unemployment and are forced to migrate in search of employment. Petty traders find difficulties in getting buyers on a regular basis. Large businesses and rich farmers were found vulnerable by a lesser degree. However, during natural calamities like droughts, floods, cyclones etc. this group also becomes vulnerable to some extent as their business and assets get damaged. But due to better access to assets, this group is not considered severely vulnerable to changing climatic conditions. The study revealed that the local people have evolved many local adaptive practices to deal with the difficult climatic conditions.

Key words: Livelihood, Natural Disaster, Climate change, Management, resource, community

1. Introduction

The coastal zone of Bangladesh consists of the 19 coastal districts. This area has further been divided into exposed and interior coast considering degree of vulnerabilities to disasters rooted in the seawards direction. More than 35 million people live in the 47,201-sq. km area of this coast (IUCN, Jan 2011). Major livelihoods in the coastal zone are agriculture, fishery, salt farming, shrimp culture, industrial and agricultural labour, and extraction of forest resources etc. Livelihoods activities of the people's dependent on natural resources are degrading the coastal ecosystems and invading spaces of biodiversity. The major environmental issues faced by the country includes cyclones and storm surge, land erosion, flood, drainage congestion, salinity intrusion, drought, earthquake, shortage of drinking water & arsenic contamination, ecosystem degradation, pollution and climate change. The country is repeatedly struck by severe cyclones leaving devastations for human beings as well as biodiversity. In this report tried to identify the scopes and prospects of improving lives and livelihood of the Teknaf area, a brief description has given below on the study area.

2. Objective of the Study

Climate have major physical impacts on agriculture, industry, infrastructure, disaster, health and energy and consequently on people's livelihood in terms of employment, income and consumption. Various groups in society will experience the impacts in various degrees dependent upon their initial economic conditions (poor or non-poor), location (coastal or non-coastal, rural or urban) and gender. Low economic strength, inadequate infrastructure, low level of social development, lack of institutional capacity, and a higher dependency on the natural resource, make the country more vulnerable to climate stimuli (including both variability as well as extreme events). Addressing present and future problems related to the climatic effect is appeared to be a complex issue for Bangladesh. Considering the

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above circumstances, it was necessary to conduct current research on "Community-based Livelihood Management in relations to Natural Disaster– A Study on Teknaf (coastal) area of Bangladesh".

Specific objective of the study

Specific objective of the study intended to

- Review livelihood related management policies and practices of the disaster-prone coastal zone communities of Bangladesh;
- Identify climate change issues affecting the livelihood of the area people;
- Identify/Document livelihood systems of the communities in Teknaf upazila of Cox's Bazar district;
- Identify the major problems of the community, ranking and solutions perceived by the community;
- Recommend appropriate livelihood management strategies for Teknaf area.

3. Literature Review

Different level of research has been conducted on the coastal management, livelihood management and related issues in home & abroad. From the existing literature review gives an way forward to know about coastal livelihoods an introductory analysis, living in the coast people and livelihoods, living in the Coast Problem, Opportunities and Challenges, living in the coast measuring quality of life, living in the coast urbanization, resource use by indigenous community in coastal zone of Bangladesh, coastal livelihoods situation and context, generating sustainable employment in the coastal zone Bangladesh - present situation and future potentials etc. All the existing research are divers and covering vast area of coastal livelihood of the country. All the prior studies/ research has objective that are related to this study and not similar. From review all these related documents this study has got a path to go forward.

4. Methods

This paper is fully based on primary and secondary information collected from different sources. Secondary data collected from existing literature review of various book, journals, reports, website etc. Primary data has collected from the field by visiting physically as well interviewing people form the study area. The integral part was to identify and collect data; they were classified, analyzed, interpreted and presented in a systematic manner to find the vital points. The assessment activities were carried out in four major steps given below figure:

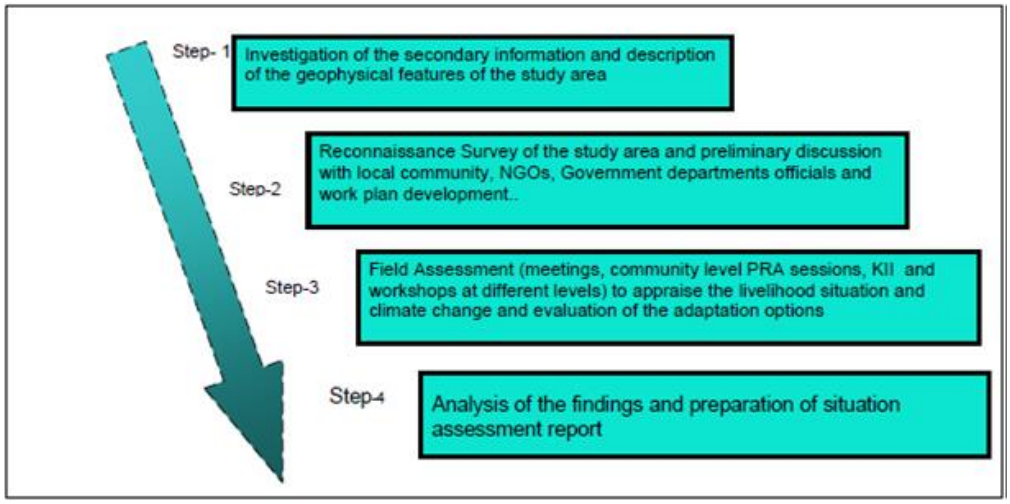

Figure 3: Steps of assessment activities

5. Results

Different livelihood groups and patterns, including their respective vulnerability, were identified. Assessed local livelihood options and their seasonal dimensions and changing trends. A livelihoods classification was done through a participatory discussion with the community people and based on national data in order to understand the status of the livelihood groups of the study area in below table.

Table: Union wise livelihood classification of the community in the study area

Livelihood group	**% per union**			
	Teknaf Sadar	**Nhila**	**Subrang**	**Baharchara**
Farmer (Salt)	3	7	4	3
Wage laborer (Fishing & Salt production)	19	8	15	21
Fishermen	66	63	71	66
Businessmen	6	14.5	6	5
Service holder	5	4.5	3	4
Others	1	3	1	1
Total	100	100	100	100

The local community in the study area Unions consists of various livelihood groups as mentioned above. Almost all livelihood groups are affected by different types of natural and man-made risks (like natural disaster - cyclone, storm surge, inundation with saline water etc.; climate change – sea level rise, rise of temperature, increase of soil & water salinity etc.) However, the vulnerability of these livelihood groups to different risks depends on various physical and socio-economic factors:

a. Physical assets – cultivable land, irrigation facilities, agriculture/ fishing equipment, livestock, housing conditions, orchard/ homestead garden etc.

b. Human resources- literacy, education, knowledge and skills, availability of health facilities, overall health of the family etc.

c. Socio-economic conditions - Overall social status, access to local decision making groups, cash savings credit and markets, cash valued assets)

As the same risks, may have different impacts on different sectors and members of society, the local communities have been divided into various livelihood groups, i.e. small/ marginal farmers, large farmers, rural wage laborers, fishers, large business men and petty traders. Special attention was given to the specific vulnerability of women.

The degrees of vulnerability (very high, high and medium) of farmers in the four unions of the study area to various risk factors are shown in below table, which is based on focus group discussion and interaction with different organization.

Table: Union wise levels of vulnerability of small & large farmers

Major risk factors	**Nature**	**Teknaf Sadar**	**Nhila**	**Subrang**	**Baharchara**
Salinity	Climatic	VH*	M*	H*	VH
Tidal water intrusion	Climatic	VH	M	VH	H
Tidal Surge	Climatic	VH	M	VH	H
Drought	Climatic	H	H	H	M
Heavy rainfall	Climatic	H	M	M	M
Water logging	Non-Climatic	M	H	M	M
Flood / Flash Flood	Climatic	M	M	VH	M
Kalboishakhi	Climatic	M	M	M	M
Depression	Climatic	M	M	M	M
Hail Strom	Climatic	M	M	M	M
Thunderstorm	Climatic	H	M	M	M
Cyclone	Climatic	VH	VH	VH	VH
River Bank Erosion	Climatic	VH	M	VH	NA
Insect- pest infestation	Non- Climatic	VH	H	M	VH
Fog	Climatic	NA*	NA	NA	NA
High price of agricultural inputs	Non-Climatic	M	M	M	M
Unavailability of agricultural inputs	Non-Climatic	M	M	M	M
Crop yield reduction	Non-Climatic	H	M	M	H
High Temperature	Climatic	M	M	M	M
Change in land use pattern (from agriculture to shrimp/ Salt cultivation)	Non-Climatic	VH	M	NA	

*Legend: VH- Very high; H- High; M- Medium, NA – Not Applicable

A list of the major local climatic and environmental hazards and the frequency of their occurrence was generated through documents from a website. Concerning vulnerability and the risks, a perceptions assessment was done by taking opinion, about the occurrence, frequency, intensity of the hazards and the impact on livelihoods of the local people. The risk from coastal hazards is characterized by the frequency of occurrence and severity of the hazards. People had been asked to rank the natural disasters by assigning points to them. The most common hazards considered by the respondents are cyclone, storm surges, sea erosion. Below figure shows that in Teknaf Area, 82.7% people, irrespective of their background consider cyclone be most risky. Another 13.9% people consider cyclone to be risky. Around one fourth of coastal people rank tidal surge to be most risky event. Around 67.6% people categorize tidal surge to be risky. Around 85% -95% of the coastal population have rated Earthquake and Draught as either "least risky" or "moderately risky", whether livelihood groups deviate from this general perception is explored then. It is found that people from all the livelihood groups are consistent in rating riskiness of natural hazards. These findings help to deduce that cyclone and tidal surge appear to be major threats for all the livelihood groups.

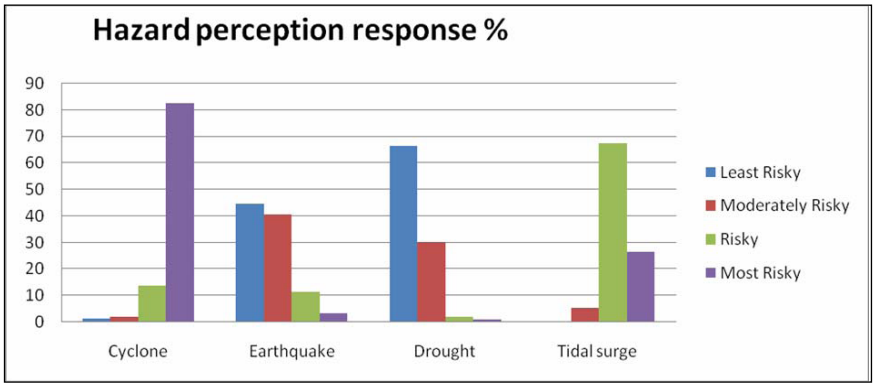

Figure: Hazard perception response of the local community

A possible future risk scenario including its impact on the livelihood was drawn by the community people, using a risk identification matrix as shown in below table. The scenario was based on the peoples' past experiences and perceptions, and current trends of increasing risks due to changing climatic conditions and accelerating intensity and frequency of natural hazards. The people perception is that if the climatic conditions keep on changing at the current rate, the impact of the main natural hazard on agriculture and allied sectors will be even more adverse in the next ten to fifteen years.

Table: Future risk scenario (based on local community perceptions and linking it with the climate change/ impact data)

Hazard	Vulnerable sector	Climate change impact/risk in coming future
Salinity	Agriculture/crop	Major crop losses per year, lower growth rate of plants, leaf injury and yield losses
	Livestock	Approx. 20% less production
	Fisheries	Loss of domestic fish varieties, approx. 70% yield losses
	Forestry	Plants become infested with different diseases, plants death rate increases, less production of fruits, enormous loss of betel nut, mango, jack fruit and litchi tree
Cyclone	Agriculture/crop	Huge crop damage, especially of Rabi crop
	Livestock	Increased death rate of livestock
	Fisheries	Approx. 50% of fish washed out from water bodies, increased fish death rate
	Forestry	Approx. half of the total tree stock damage
Storm surge	Agriculture/crop	Huge crop losses
	Livestock	Approx. 30% livestock losses
	Fisheries	One third fish loss, increased disease infestation
	Forestry	Approx. 30% of nursery seedling damaged
Flood	Agriculture/crop	Two third loss of T. Aman crop and huge damage to preserved food grain storage
	Livestock	Increased disease infestation, large number of deaths of cattle and poultry
	Fisheries	fish washed out from many fish fields
	Forestry	About 20% damage to nursery seedlings and saplings
Drought	Agriculture/crop	Rice crop damage
	Livestock	Scarcity of animal feed, livestock losses
	Fisheries	Approx. 20 % fish loss, increased disease infestation
	Forestry	Lower productivity of coconut and betel nut, increased fruit dropping, plants damaged due to lack of irrigation
Water logging	Agriculture/crop	Increased fallow land area, sweet potato, water melon, potato, gourd, chili, and tomato crop losses,

Hazard	Vulnerable sector	Climate change impact/risk in coming future
	Livestock	Increased disease infestation, approx. 20% less production of live stock
	Fisheries	About 15% fish loss
	Forestry	Approx. 15% seedling damaged

The local population in the study area is trying to adapt the changing climatic and other socio- economic conditions. There is, however, scope for identifying new options and for upgrading and/or refining the existing ones to meet the local livelihood needs. many local elite/experienced persons and various government and non-government organizations officials a number of options have been identified as having the potential to improve livelihoods adaptation and the management of climatic risks in the area. They are in below table:

Table: Major Problems and proposed Solutions Locally can be adaptation options

Problems	Solution	Recommendations
Fishes are decreasing day by day.	Banning of Trawling in Shallow (less than 40 Bam) water.	- Organize area based organization and aware the local people about the rules and regulation of trawling. - Inform the positive side of banning of trawling in shallow water. - Imposing a system of huge penalty for trawling in shallow water. - Involving Coast Guard and way along with low enforcing agency. - Increase Government Control over trawling. - Involving small fish boat as a source against trawling in shallow sea.
	Banning all types of fishing in the month of June, July & August.	- Form area based organization and make people aware of the positive impact of this solution. - Involving local elites and aged group in awareness campaign. - Measures should be taken so that no trawler & boat can either enter or exit the fishing ghat in these 3 months. - Government should take the responsibilities so that Hatchery cannot collect mother shrimp in these months and trawlers cannot go to sea. - Employ guard along the sea shore to implement the solution.
	Repairing the existing embankments and constructing new one's so that sea water cannot enter in to lakes and canals.	- At first existing embankments, should be repaired and this repair should be made in the month of October - January. - Quality materials must be used in repairing the embankments. For the spots, too close to sea, bolder sand concrete blocks should be used. - After the repair work plantation, should be done with heavily rooted plants species. - Measures should be taken so that lakes and canals cannot be turned to salt field or shrimp farm. - Embankment maintenance and fresh water aquaculture practice should be done by local conservation groups.
Problems in Agriculture.	Dept. of Agriculture should arrange training for the farmers.	- Farmer training program should be arranged through area based group. - Farmers with a small land or no land should be preferred for training. - The topics of the training should include seed bed preparation, using proper fertilizer pesticides etc. - Successful trainees should be facilitated with loan so that they can implement these trainings in field. - Farmers should arrange at least one meeting a month on different Agro- issues and NGO's should represent the meeting.
	Chemical fertilizer should be easily available in the area and should be properly used.	- First of all a list of genuine farmers should be made by the local area organization and should be trained in right use of fertilizer. - The local Agricultural office should test the Farmer's land fertility in free of cost. - The smuggling of fertilizer should be stopped by forming effective committee involving local elites and politicians. - Punishing the involved persons in smuggling. - Farmers should get the fertilizer directly instead via dealers. - Government should help the local organizations. - Local farmers should be trained and award to use organic fertilizer.
Number of trees has decreased in the area.	Arrange local community through group and involving them in social forestation in the Government Khas land.	- To make aware the local community social forestry. - Through area based group/ organization, Khas land should be leased from UNO/DC/ Forest office. - Beneficiary group selection and completing the agreement draft. - Strong measures should be made so that conflict do not arise in selecting beneficiary group. - Along with plantation the beneficiary group should be well award about the maintenance of the social plantation. If they cannot bear the expense of the maintenance, then Government should help them and it should be noted in the agreement made between Government and beneficiary group. - A committee should be formed from the beneficiary group who will take care of the whole plantation and willmake solution of all conflict. - Upazila level officers should be involved in all steps of agreement. - Along with social plantation, villagers should be trained in alternative income

Problems	Solution	Recommendations
		generation activities and they should be trained on "High tech stove.
	Unnecessary deforestation should be protected and trees should be planted in homestead area.	- Villagers should be informed about the financial value of the homestead trees and plants. - Free Government seedlings of timber, medicinal plants should be distributed by locally formed group and this group is also responsible for maintenance of the planted trees. - The seedlings should be distributed without any favoring to anyone. - NGO initiative should be taken to establish nursery in the area. - Government official should visit the plantation to make people interested in plantation.
Embankment related problem.	Embankment should be repaired and highly rooted plantation should be made on the sides of embankment.	- At first locally formed group should take the permission of plantation on embankment from the respective office. - The plants for plantation should be locally available. For this purpose, nursery, should be established. - The villagers should be trained on plantation & plantation management. - The income/ profit from the plantation should be divided 50/50 between the local groups fund and plantation care taker. - The plantation should also be used in other income generative activities. - The repair work of the embankment should be directly supervised by Authority; not the contractors. - Embankment should be repaired through "Atel" types of soil. - Physical survey is must before, construction of new embankment. - Regular visit is essential by Government officials in maintaining the embankment. - The part of embankment which is too close to sea should turn inside. - Along with Government supervision, a local Committee should be formed to maintain the embankment.
Natural Disaster issues	In case of any devastation like cyclone, Storm etc.	- Build awareness about the natural disaster situation. - Ensure early warning system from all level. - Train people on emergency evacuation, rescue, response & recovery. - Strengthening community by cooperative activity like food bank etc. - Insist community to face any problem collectively. - Increase participation, cooperation and collective effort to the community - NGO's and other Government organization should take initiative to increase capacity and insist community to be united for their better livelihood.

6. Conclusion

In Teknaf Upazila, adverse impacts of climatic risks and its increase in near future the lives of local community are badly affected in many ways. In the four study area unions, increased cyclone is ranked as number one risk, causing huge damage to the crops, water and the entire environment of the area. In addition to Cyclone, the other major risks posing direct threat to livelihoods are salinity and floods, storm surge, droughts, water logging, deforestation and forest degradation, insect and disease infestation and virus infestation in fishes. The vulnerability of different livelihood groups depends on various physical and socio- economic factors, deciding the coping capacity of the individual group to resist the disaster impacts. Among the various livelihood groups, the rural wage laborers are at the highest risks, followed by small / marginal farmers and fishers. Women due to number of socio- cultural and other physical reasons are generally more vulnerable to climatic and non-climatic risks.

The situation study showed that the local population, vulnerable to various natural and human induced risks is already trying to adapt the changing climatic and other socio- economic conditions. There is however, need for further updating and/ or refining of existing practices. Several adaptation options have been identified which have the potential to improve the livelihoods adaptation capacities and the management of climatic risks in the area. Further research is needed to assess climatic effect on livelihood management of all other disaster prone areas over Bangladesh.

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The Role Local Initiatives in Community Based Disaster Risk Management in Kemijen, Semarang City

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Abstract

Community-based disaster risk reduction is one of the homegrown initiatives efforts and community empowerment oriented in disaster management. This approach is very important because no one can understand the conditions in a region better than the local communities. Therefore, the implementation of CBDRM always emphasize local initiatives in decision making. The existence of local initiative is necessary specially to anticipate the impact of climate change which is increasingly affecting towns in coastal areas, including settlements in Semarang. Kemijen Urban Village is one of the informal settlements in Semarang, which has the highest intensity of flood that is 12 times during 5 years (2011-2015). The research question is how the level of local initiatives in flood disaster management in Kemijen, Semarang? This study aims to assess the level of local initiatives in Kemijen as the community adaptive capacity of flood prevention in pre-disaster, emergency response, and post-disaster. Local initiatives assessed on water supply, sanitation, food, shelter, health, drainage maintenance and waste management. This study shows the level of local initiatives in pre-disaster and post-disaster is almost same and bigger than the response phase. Scoring results showed that pre-disaster is 35.002, 27.9577 for emergency response, and post-disaster is 34.9862 with each category that is independent, empowered, and independent. This study also shows that local initiatives in Kemijen largely formed by individual initiative and only a few were formed by a collective initiative.

Keywords: Local iniciative; flood; CBDRM; urban disaster

1. Introduction

In recent years, the impact of climate change is increasingly affecting the cities in coastal areas. This is a result of unplanned urban growth, especially the increase of informal settlements occurs in large scale in the coastal areas [11]. The growth of informal settlement growth phenomenon occurs in cities in developing countries, including Indonesia. As unplanned neighborhoods with the heterogeneity of society, the village has problems such as poor quality of the houses, where public space is minimal and the quality of public spaces is low and the legality of land [8]. Living in informal settlements makes people more vulnerable to climate change. Public vulnerability is compounded by the very limited resources, inadequate infrastructure, and weak institutional systems weak and ineffective [1]. It shows that living in informal settlements is particularly at risk for experiencing a loss in the face of disaster. The ability of communities in disaster risk management is necessary especially in the informal settlements that are vulnerable to disasters. Disaster risk management is a systematic approach to reduce vulnerabilities and risks, and to strengthen disaster resilience.

In 2011 extensive tidal inundation in Semarang amounted to 1538.8 ha, it spreads over 8 out of 16 districts. One the district is the Eastern District of Semarang with an area of 44.15 ha reaches tidal inundation, tidal inundation area was just scattered in the Kemijen [9]. Kemijen also has the highest intensity of flood in the city of Semarang with 12 times the incidence during the period of 5 years (2011- May 2015). However, these conditions do not make public to avoid staying in the Kemijen village and chose to remain in the region for various reasons such as economic constraints. For further information, most people in Kemijen about 45% are as industrial workers whose earn the regional minimum wage (UMR) of Semarang. Adaptability to reduce disaster risk at the local level is necessary. Since Kemijen community feel and direct observe themselves, so that they can understand the condition of the region especially related to the disaster. It's important to associate the risk of flooding with initiatives related to adaptation to climate change, and the specific issues of urban planning and management, such as the construction of infrastructure and provision of basic [11]. Local initiative itself is also included in one of the core elements proposed by [4] in an awareness empowerment. All the steps and the activities carried out in PRBBK are based on the process of awareness

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planned [6]. Therefore, this local initiative is part of a community-based disaster risk reduction. These local initiatives need to be explored in Kemijen Village community as one of the capital to improve adaptability in disaster management.

Taking consideration on those issues, this study was conducted to answer the research question "What level of local initiatives in the prevention of flooding in the Kemijen?" The aim of this study is to assess the level of local initiatives in Kemijen village as the adaptability of the public in flood prevention in three stages of disaster, namely the pre-disaster, emergency responses and post-disaster.

2. Methods

This study focused on the role of the community in the initiative for disaster management based on aspects of the Sphere Project in three stages of a disaster, according to the issues that have been formulated in this study. The Sphere Project's aspects used as a study variable are namely the water supply, sanitation supply, food supply, provision of shelter/transitional shelters, health care provision and rescue, drainage maintenance and waste management [10]. This research used quantitative research methods. The sampling technique used was Probability Sampling with random sampling technique. The samples technique was done by assuming one representative family in Kemijen as one respondent. Furthermore, this study used the Slovin formula in determining the number of samples with a tolerance limit of 10% or 90% level of accuracy. So that it can be claimed that this study used 98 families.

This study used a descriptive statistical analysis to describe the results of data processing which is then presented in of charts, graphs, and maps. To determine the level of local initiatives, this study used scoring function to assess the criteria listed in each indicator by using Likert scale. The weight of the score for each indicator is based on the number of indicators in each variable, so that the total score is well distributed and balanced.

3. Results

The Analysis of Kemijen Community Characteristics. This analysis describes the conditions of the community that contains two things: the socio-economic characteristics of society which include level of education, livelihood, income levels and characteristics of local institutions in the form of formal institutions and informal (community) in the local level relating to development and disaster in the Kemijen village. Marfai et al. [7] described the socio-economic characteristics of the local community as one of the key factors that affect disaster response measures.

Community Socioeconomic Characteristics. This aspect is about the level of education and economic conditions as seen from livelihood and income levels in Kemijen. Income level. General overview on community's education level in Kemijen is low. It is proved from the population with 36% are primary school graduates, further, there are also the population who do not complete primary school so that the total percentage of both at 44%. The level of education is one of the important indicators which show the quality of the population in Kemijen. The low level of education affects the livelihood and their income, therefore Kemijen village is dominated by the workers. The level of education also influences in disaster relief efforts, because of insight or knowledge affects how people think and take the initiative before they undertake the necessary measures for disaster mitigation in Kemijen.

Economic Conditions. The majority of the population in Kemijen are low-income communities (MBR) or below Rp 2.100.000, - per month with a percentage of 84%. It can be seen that generally people work as laborers in the amount of 51%. It is in line with the level of education of the people. Moreover, based on monographs data, there are 1,340 households included in poor communities. This condition makes people choose to in rural areas. Low income level which indicates poverty in Kemijen makes people vulnerable to floods.

Analysis of Local Institutions. The local agency in Kemijen village consists of formal and informal institutions (community). One of the characteristics of the local institution is the existence of collective consciousness, as mentioned by Durkheim[3]. The explanation strengthens that community-based disaster risk reduction is related to the concept of community empowerment, in which one of its core elements is awareness.

Local Initiatives Analysis in Flood Prevention Needs Supply. This analysis will discuss indirectly how local action and local knowledge contained village Kemijen as part of a local initiative in flood disaster management in Sub Kemijen associated with the provision of clean water, sanitation, food, shelter / temporary shelter, medical services and rescue, as well as drainage and solid waste management.

Water Supply. Clean water sources used by Kemijen's community are same at three stages of disaster. As many as 72% of people in Kemijen are using PDAM (Municipal Waterworks) water and 14% are using wells water. Those who use well water said that they can not use PDAM water because it is difficult access in the installation, so the installation will be more expensive, especially if the installation is not done at the same time. Seeing these conditions, there is one person in Kemijen initiative in the provision of clean water as well be big opportunity for him becoming a distributor of clean water. The result is amounted 14% of people in Kemijen buy clean water from this distributor.

Other issues come up related to the clean water supply and the water is turbid. However, people have been thinking over on these issues. They take the water in a container and then wait the dirty go down so that the clean

water is in the top, then they consume it. On the other hand, people who are lack of water supply initiate to accumulate the water, so that it can be used whenever they need it. Generally, all the initiatives in this variable are the individual initiative, while the collective initiative has not been seen in the provision of clean water. It is not in line with what Lassa et al. [5] said about.

Provision of Sanitation. More than 94% of community already have private toilets in their house that, while 6% of the people do not have private toilets. Those who do not have private toilets said that they could not able to build a septic tank and private toilets for sanitation purposes, therefore they use communal toilets. To see the spread of communal toilets can be seen in Figure 3.

Since there are many people still do not have private toilet, it drives the community to ask the government to build communal toilets for them. All communal toilet construction was done by the people, but the financial resources were from the government, private sector and the community. Usually the government funds a kind of permanent toilet, while the community build semi-permanent toilet.

Analysis of Local Initiative on Floods. After doing the calculations scoring for each respondent, then the whole question added up in order to get the total score at each stage of the disaster. The total score will be categorized based on the level of empowerment in the context of disaster management. So it can be formulated whether people in Kemijen seen from initiative at three stages of disaster, namely, pre-disaster, disaster response and post-disaster included in the category of powerless, capable, independent, or civil. Here is the scoring result of the level of local initiatives Kemijen Village community in disaster management.

Table 1 Scoring results of local initiatives Village Kemijen

Variable	Pra Disaster	Emergency Response	Post Disaster
Water Supply	55,1633	54,1224	54,8571
Provision of Sanitation	55,7755	55,3469	55,5306
Food Supply	46,5306	49,8571	46,8367
Provision of Housing / Temporary Shelter	0,0000	13,5612	0,0000
Provision of Health Care and Rescue	4,0408	5,2653	4,6531
Drainage Management	38,5459	0,0000	38,0867
Waste Management	44,9592	17,5510	44,9388
Total	35,0022	27,9577	34,9862

The total scores of local initiatives when categorized based on the level of empowerment in the context of disaster management at the three stages of a disaster, the result is Kemijen community is powerless in the stage of the emergency response. Category helpless still considered unfavorable because it signifies that the community as a whole still depend on government and private sector, so that society is less visible initiatives in this stage. As for the pre and post-disaster, community is in independent category. Independent category is assessed quite well in this stage, because it indicates that the majority of people have initiative in making or proposing a program and to apply, besides the public have also been able to access and maximize existing resources.

4. Conclusion

The overall level of local initiatives in Kemijen included in self-help category at post-and pre-disaster stage, which means generally community can meet their needs in accordance with the initiative by utilizing the existing resources. The community already has initiative in making or proposing a program and applying it, though the government and private sectors still give assistance. On the other hand, response stage of the community included in capable category, which means that the community still needs assistance in responding flood disaster, although the community itself is capable to optimize what they get. Results of assessment on the level of local initiatives at pre-disaster and post-disaster stage have the same results in all the variables. It can be seen from the community's mindset about the different stages of a disaster with what is found in the literature,. Some people think that there are only two phase in disaster process, disaster and no disaster. In addition, a variable which is closely related to the disaster management process has a low yield compared with other variables which has high related to daily living needs.

When referring to the theory used in this study, the study's results supports the Chaskin theory (2001) on how the interaction aims to promote and maintain the welfare of society emphasizes the action initiative. The results also support Chaskin (2001) argue that the initiative is divided into two types, namely the individual initiative and collective initiatives. The individual initiative is the initiative that the idea comes from individuals and decision-makers in action lies in the individual, although this initiative will have an impact for the public. One example is a person who acts as a distributor of clean water. Costly water supply through the PDAM and unclean wells water is yet provided to make the person take the initiative as a distributor of clean water in Kemijen. Collective initiatives is the

collective ideas of several individuals as outlined in the deliberations for the resulting agreement or a joint decision. One example is there are people felt sorrow for access to sanitary, therefore some people apply for aid when (discussion was held) musrenbang to the government related to the provision of communal toilet. Collective initiativeint is in line with theory that was purposed by Lassa et al. [5], namely the increasing of sense of belonging, sharing the same disaster risks. Geographically, community is in the same location and they are vulnerable to disasters. It means, they have the same catastrophic risks, so that society take the initiative in meeting the needs of disaster management. However, when we see in the earlier analyzes, local initiatives in Kemijen is largely shaped by individual initiative and only few things is formed by collective initiative. It shows that the flooding problems in Kemijen are not included as collective problem, meaning that the definition of sense of belonging, sharing the same disaster risk has not been established in most societies. Therefore, based on those issues, the accommodation is needed in reducing disaster risk in community-based institutional which is carried out by KSB Kemijen.

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Remittances and Expenditures Of Foreign Labours In The Malaysian Construction Industry

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Abstract

Foreign labours are commonly employed in the Malaysian construction industry. Their existence helps to stimulate the economic growth through construction activities. The income received are remitted to their home countries and at the same time they also spend it for basic needs in the host country. Through desk study and face to face interviews using questionnaire surveys, the study explores the amount of remittances and types of expenditures by these labours. A total of 200 foreign labours were interviewed around Klang Valley. The results suggested that these foreign labours remitted between 30%-40% of their monthly income and transfer it back home. In the meantime, the types of their expenditures in host country include food, clothing, transportation, levy and others (entertainment, etc.).

Keywords: Remittance, Foreign labour, Construction, Expenditures

1. Introduction

The Malaysian construction industry is one of the major employers of foreign labours. Locals shine out of the industry due to the negative perceptions towards the industry which is labelled as dirty, dangerous and difficult. Although the employment of foreign labours helps to fulfill the demand for labours in the industry, they also contributed towards the outflow of money from the country, i.e; remittances. At the same time, they spend their monthly income on basic needs for daily life.

The study reported herein is based on a survey conducted by Sharina & Khairuddin [1] on estimating remittance from foreign labour in the Malaysian construction industry.

This paper aims to explore the amount of remittances and types of expenditures by foreign labour in the Malaysian construction industry. This paper is in 5 parts; Part 1 introduces the paper and Part 2 discusses the employment of foreign labours in the Malaysian construction industry. This is followed by Part 3, the methodology of the study reported herein, Part 4 discusses the results of the study and lastly Part 5 concludes the paper.

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2. Foreign Labours in Malaysia

Migrations happen because of the economy, social and physical factors. Foreign labours migrate to other country to seek opportunities for better employment and income, which are considered impossible in their home country. This section discusses foreign labour employment in Malaysia and in the construction industry. Data are presented to show the no. of foreign labours employed in the various sector in the economy and their country of origins.

2.1 Data on Foreign Labour

Table 1 below shows the no of foreign labours employed in the various sectors of the Malaysian economy from year 2010 to 2016. The table indicates that construction is one of the major employer of foreign labours in the economy.

Table 1. No of foreign labours in various sectors in the economy (2010-2016)

Year	Total (million)	Manufacturing	Plantation	Construction	Services	Agriculture
2010	1.9	717,747	300,627	266,806	471,420	122,318
2011	1.6	533,885	198,906	151,917	564,583	118,449
2012	1.6	603,924	310,772	233,880	307,569	145,775
2013	2.1	733,200	347,149	425,532	N/A	N/A
2014	2.0	722,750	N/A	415,599	N/A	461,400
2015	2.2	770,518	314,362	437,803	N/A	N/A
2016	1.9	763,400	345,400	431,200	N/A	N/A

Source: Economic Report (2009/2010 – 2015/2016) [2] – [9]

Table 2 below shows the no. of foreign labours based on their country of origin. It can be derived from the table that the foreign labour are by large coming from Indonesia. The majority of foreign labours in the country are dominated by Indonesian and it remains as the major supply of foreign labour in Malaysia. This is partly due to the almost similar culture, religion and language shared between Malaysia and Indonesia, making it easier for the labours to adept to the local environment and assimilate with the locals.

Table 2. No of foreign labours according to country of origin (2010-2016)

Year	Indonesia (%)	Bangladesh (%)	Nepal (%)	Myanmar (%)	Others (%)
2010	50.9	17	N/A	N/A	N/A
2011	35.2	6.7	N/A	N/A	N/A
2012	48.5	8.5	N/A	N/A	N/A
2013	N/A	N/A	N/A	N/A	N/A
2014	40.4	14.9	20.9	7.2	16.6
2015	38	12	24	6	20
2016	40.9	12.9	21.9	7.3	13

Source: Economic Report (2009/2010 – 2015/2016) [2] – [9]

2.2 Remittances

Remittances happen when there are labour movements within countries. Ferdous et.al [10] defines remittances as the process of transferring money by foreign labours to their country of origins. Remittances is a powerful economic force for economic development whereby many labour-exporting countries provide financial resources that helps to reduce poverty by providing the basic needs for the labours' families. It also serves as an important source of income to the labour exporting countries.

Remittance transaction flows can occur through two approaches; formal transaction or informal transaction. The formal transaction is done by remitting the money though formal channels such as through banks or Post Malaysia.

Other channels are through licensed money transfer companies, i.e; Western Union or Money Gram. Besides the formal channels, the informal transaction happens through courier services, employment agencies, friends or families travelling back home, etc. Due to the existence of the informal channels to remit money, the actual amount of remittances is difficult to be established.

2.3 Expenditure

Monthly income received will also be spent on basic needs to survive in the host country. Foreign labours in the construction industry in Malaysia are normally being provided with accommodation by the employers, either on site or elsewhere. Common basic needs are such as food, clothing, transportation (to get the necessary basic needs; food and clothing, etc.) and others (telecommunication, entertainment, etc.) [11]. The amount spent on each type of the expenditure would vary from one person to another.

3. Methods

Data for the study was collected through face to face interview using a set of questionnaire survey. A total of 200 respondents, consist of foreign labours working in construction sites around Selangor and Klang Valley were interviewed. The face to face interview were done to ensure the optimum quality data received since not all respondents are able to complete the survey on their own. The survey were conducted from April to September 2013.

4. Results

From a total of 200 samples, only 199 (99.5%) were considered valid for analysis. One (0.5%) of them was incomplete. The valid data was analysed using SPSS software.

Briefly on the demographic data of the respondents:

- Gender: 91% male and 9% female
- Country of origin: Indonesia (43.5%), Bangladesh (42%), Pakistan (8%), Nepal (0.5%), Myanmar (3%) and Others (3%).
- Trade of work: Construction worker (94%) and Machine operator (6%)

Remittance

Result from the survey suggested that the amount remitted by the labours is from 30% to 40% (with the majority remits between RM500 to RM800) of their monthly income. The amount varies, depending upon their expenditures in host country and the needs of dependents in home country. The method of transferring remittances are through both formal and informal method. Formal methods are through bank, Post Malaysia or remittances registered company while informal methods are through courier services, friends/families travelling back home, etc. The mean frequency of money remitted back home is 9 times per year.

The results also indicated that the mean basic monthly salary is RM1,494.92 and mean total monthly income (including overtime) is RM1,871.28.

Expenditures

Table 3. Results on the types of expenditure and its mean monthly amount

Type of expenditure (monthly)	Mean (RM)
Food	298.47
Clothing	31.23
Transportation	31.86
Others (Telecommunication, Cigarette, Entertainment, etc.)	214.75
Levy (Annually)	1,857.39
Total Expenditure/month	731.09

Table 3 above shows results on types and monthly amount of expenditures by foreign labours in Malaysia. The mean amounts were derived based on the results from 199 valid samples. From the table above, the types of monthly expenditures are food, clothing, transportation and others (telecommunication, cigarette, entertainments, etc.). In addition, they also pay levy annually.

The mean amount for each type of expenditures are RM298.47 for food, RM31.23 for clothing, RM31.86 for transportation and RM214.75 for others. On item 'others', the respondents mentioned that they are spending their income on telecommunication to contact family back home, cigarette, entertainment and etc. All respondents are staying in accommodation provided by the employers, either on site or elsewhere. Therefore, accommodation is not included in the type of expenditures. The mean of total monthly expenditure is RM731.09 (48.91% of total basic salary and 39.07% of total income (including overtime)).

5. Conclusion

The paper discusses on the employment of foreign labours in the Malaysian construction industry, particularly on the remittance and their expenditures in Malaysia. It is obvious that the purpose of seeking employment in the industry is to seek better pay, given that the opportunity of employment due to the vacancy left by the locals. The demands for labour in the industry has attract foreign labours to influx the industry to fulfill the demand.

These labours received income and remit the money to help their families back home. At the same time they also spend it for basic needs in Malaysia. The amount remitted depends on the needs of the families and the result suggested that on average, they remit between 30% - 40% of their monthly income at the average frequency of 9 times a year.

The study reported herein also reveals that the types of monthly expenditures by the labours are food, clothing, transportation and entertainment. In addition, they also pay levy annually. The average amount of monthly income spent on expenditures is RM731.09 or 39.07% of their monthly income.

The study is preliminary in nature. However, data collected are considered useful to understand remittances and expenditures of foreign labours employed in the Malaysia construction industry. Further in-depth study is on-going.

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Patterns Of Social Networks Senior High Students (SMA Negeri 8 Malang) in the selection Mode

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Abstract

Malang is the education city, in the movement of students toward educational facilities the tendency of students high school age (ages 16 – 18 years) is often seen using a motor vehicle and other rollicking mode. Based on the theory that teens tend to follow the opinion of his group and his Group considered that it is always true and the tendency to join peers so that the students are still the labile social groups potentially huge can affect the choice of travel mode. The Purpose of this research is to know the pattern of social networking senior high school 8 Malang in the selection of the mode of transportation for travel for the purpose of education. The analysis that is used to look at the pattern of grouping selection mode is based on the selection of the mode of using Social Network Analysis. So the results of this research were graph social networking students based on the results of the analysis of the Social Network Analysis of the use of a mode of travel for the purpose of education. The research results will be show the students have a different mode of usage patterns to go and home school. the school students doing away the moment the use of mode are individually with different types of transportation modes while the moment home school changes a significant mode of use. so a pattern was obtained by use of the tendency of the mode of transportation that interpret the patterns of social networks between each students tend to have an affinity towards the use of transportation modes.

Keywords: Selections-Moda, Social Networks, Social Network-Analysis, The Towns Of Malang

1. Introduction

In Indonesia, especially in the city of Malang, the tendency of students of high school age (ages 16 –18 years) using motor vehicles are often seen. High school students is a group of communities that are vulnerable to the influence of the environment in determining the choice of modes of movement/travel, be it a family environment or partner environmental.What mode of transportation Use or have to traverse a route where, more frequently adults or parents even influences from the surrounding friends can also specify. Teens tend to follow the opinion of his group and his Group considered that it was always true. The tendency to join with peers is driven by the desire to be independent [1].

According to [2] the main factor in the election, which will be used in this research is a factor of cultural, social, privacy and psychology. This study uses social factors because of the high school students see the character in taking Options tend to go with the flow and group of his friends who became the see.

2. Methods

2.1 Sampling Method

Sampling Methods students use are purposive sampling or elections purposefully with consideration of the respondent is an actor or a high school student who has the option of use the mode using the mode of transportation of personal and public transportation modes. determination of the number of samples using the theory of [2] based on the error rate. Error rate/significance which is used by 10%. Of the total population of 883 people, so that the number of samples obtained as much as 208 people.

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2.2 Research Variables

For variables of the social group in this study are as follows:

a. Participation Rates

Analysis of the rate of participation is carried out to find out the level of participation of students in senior high school 8 Malang.

b. The Level of Density

Density analysis conducted to know the density of the connections of the respondents in one school.

c. Level of Centrality

Centrality on a graph is to find the strength and influence of the students (nodes) that are most influential in a social network.

In general it can be explained that the study of the patterns of social networking high school students in the selection Mode (case study: senior high school 8 Malang) use evaluative analysis :

1. (Social Network Analysis) and SociogramThis analysis uses data which is input from the analysis results of Analysis Data Exploratory that groups and participants; affiliated students, students who are isolated; GEODESIC distance and the type of relationships between pupils [4] using the help application Gephi 0.8.2 Beta.

The output of this research is a social network graph students based on student characteristics and social groups as well as the influence of the trend of the use of a mode of travel for the purpose of education.

3. Results

Analysis of the characteristics of the mode of selection of Senior high school 8 Malang Characteristics of the use of the mode of transportation for travel with the intention of education of student senior high school 8 Malang outlines the characteristics of the students based on the type of the selected mode of transportation respondents either to go to school or home school.

3.1 Analysis Of The Characteristics Of The Mode Of Selection Based On Network Social High School Students Negeri 8 Malang

Network the social will be identified in the scope area of SMA Negeri 8 Malang is social networks are formed in social groups are followed by students. Social groups identified on the basis of membership of a social group, namely primary and secondary social group. The size of organizations/social groups in a network graph visualization is modularity, i.e. the size of the power Division of a network into one or several communities.

On the application of Gephi, a measure of the level of closeness/weight using linkert scales each value is as follows:

Value of 1 = not very Close

Value 2 = Not Near Value 3 = mediocre The value 4 = Close

Level of organizational/social group symmetry 2 direction describes the connectedness between students who are on the Organization/the same social groups. This relationship is symbolized by Gephi applications on Edge that the attribute is the value/weight of closeness/ weight between each student SMA Negeri 8 Malang.

Visualization of Value modularity describing to the kuatan student relations with students around him were as for the Numer of modularity describe distribution node on social networks, such as modularity class 0 has a number of node 1 node as many students, modularity class 1 as much as 16 nodes students and so on.

A. Rate of Participation

The participation rate measures the number of people who are in the labor force who are working, willing to work, or are actively looking for work.

Rate of Participation = the Sum of the Diagonal Matrix/Numb of Respondents

The calculation of the level of participation, illustrating each student at SMA Negeri 8 Malang average follow the total number of type of organization/social group in senior high school 8 Malang.

B. Density

Undirected graph: The edges of a graph are assumed to be unordered pairs of nodes. Sometimes we say undirected graph to emphasize this point. In an undirected graph, we write edges using curly braces to denote unordered pairs. For example, an undirected edge {2,3} from vertex 2 to vertex 3 is the same thing as an undirected edge {3,2} from vertex 3 to vertex 2.

Directed graph: In a directed graph, the two directions are counted as being distinct directed edges. In an directed graph, we write edges using parentheses to denote ordered pairs. For example, edge (2,3) is directed from 2 to 3 , which is different than the directed edge (3,2) from 3 to 2.

The density of a graph G = (V,E) measures how many edges are in set E compared to the maximum possible number of edges between vertices in set V. Density is calculated as follows:

An undirected graph has no loops and can have at most |V| * (|V| − 1) / 2 edges, so the density of an undirected graph is 2 * |E| / (|V| * (|V| − 1)).

A directed graph has no loops and can have at most |V| * (|V| − 1) edges, so the density of a directed graph is |E| / (|V| * (|V| − 1))

The average degree of a graph G is another measure of how many edges are in set E compared to number of vertices in set V. Because each edge is incident to two vertices and counts in the degree of both vertices, the average degree of an undirected graph is 2*|E|/|V|.

On the application of Gephi, to calculate the density of the graph options using the density of network students high school 8 Malang. This is to look at the density of each pair of organizations/social groups in the network.

C. Centrality

The centrality of nodes, or the identification of which nodes are more “central” than others, has been a key issue in network analysis (Freeman, 1978; Bonacich, 1987; Borgatti, 2005; Borgatti et al., 2006). Freeman (1978) argued that central nodes were those “in the thick of things” or focal points. To exemplify his idea, he used a network consisting of 5 nodes.

The middle node has three advantages over the other nodes: it has more ties, it can reach all the others more quickly, and it controls the flow between the others. Based on these three features, Freeman (1978) formalized three different measures of node centrality: degree, closeness, and betweenness.

1) Degree Centrality

Analysis of degree centrality define actor/students the most instrumental based on the number of edge or relationships that occur between a node with other nodes .

2) Closeness Centrality

This measure describes the closeness of this node with another node . Getting close, getting connected with other/affordability of a node and all other nodes in the network.

3) Betweeness Centrality

Betweeness Centrality is a measure to demonstrate how far an actor can control information between other actors as well as an actor who is a facilitator in the network.

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City Prosperity Index of Malang City

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Abstract

Make cities and human settlements inclusive, safe, resilient and sustainable is 11th target of SDGs, with Indonesia as one of the participant of SDGs is still working to achieve it. The City Prosperity Index (CPI) act as a tool to measure the sustainability of cities created by UN-Habitat in 2012, is proposed to become the monitoring system or tool of Goal 11 and any other targets that have or can have an urban basis. Based on City Spatial Planning of Malang Municipality which is currently enact from Peraturan Daerah Kota Malang Nomor 4 Tahun 2011, the policy itself aim to achieve the sustainability of spatial planning in Malang City. Therefore, the purpose of this resreach is to measure the current sustanability of Malang City. The measurement is done by using *City Prosperity Index* (UN Habitat, 2015) which consist of six measurable indicators, such as Productivity; Infrastructure; Quality of Life; Equity and Social Inclusion; Environmental Sustainability; and Governance Legislation. The CPI value of Malang City is 32,905 which means very weak classification. Therefore it is highly recommended for Malang Municipality to measure and publish the current unavailable data for short term strategies, and put some actions to improve the necessary dimension value by using proper strategies for long term strategies to achieve the sustainability as it is stated within the 11th target of SDGs. Hopefully this resreach may prove useful for further city development strategies to achieve the 11th target of SDGs by the end of 2030, which may also refer to the achieveness of Sustainable Nation through Urban Managenent.

Keywords: Sustainability, Prosperity, Productivity, Infrastructure, Life, Equity, Environmental, Sustainability, Governance.

1. **Introduction**

Sustainable Development Goals (SDGs) is world development agenda for the period 2015 – 2030 which followed by 193 countries and consists of 17 goals. Make cities and human settlements inclusive, safe, resilient and sustainable is 11th target of SDGs which mainly addressed to measure the sustainability of cities. UN Habitat has already publised a tools to measure the 11th target of SDGs called City Prosperity Index (CPI) [6]. CPI consists of six measurable indicators and each indicatos are standardized using internationaly-observed benchmark. The indicators of CPI consists of Productivity, Infrastructure, Quality of Life, Equity and Social Inclusion, Environmental Sustainability and Governance Legislation which briefly explained in fig.1.

Indonesia as one of the participant of SDGs among with 192 other countries is still working to achieve it, especially the 11th target of SDGs. Malang City which mainly functions as education city enact its City Spatial Planning of Malang Municipality Regulation No.4 Year 2011 [4], has already aimed to achieve the sustainability through spatial planning. In this case, it is needed to measure the current sustainability of Malang City especially its shares the same period with SDGs which both will ended by the end of 2030.

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Based on those circumstances, the purpose of this resreach is to measure the current sustainability of Malang City. The measurement is done by using *City Prosperity Index* [6] which consist of six measurable indicators, such as Productivity; Infrastructure; Quality of Life; Equity and Social Inclusion; Environmental Sustainability; and Governance Legislation. The calculation of each indicator with index unit will be averaged to classify the CPI of Malang City which consist of 6 classifications. Hopefully this resreach may prove useful for further city development strategies of local government to achieve the 11th target of SDGs by the end of 2030, which may also refer to the achieveness of Sustainable Nation through Urban Managenent.

2. The Content

The content consists methodolgy, brief explaination of highlight research results and research conclusion of City Prosperity Index of Malang City.

2.1. Methods

Measurement of Malang City's current sustainability is done by using City Prosperity Index (CPI) consist of six measurable indicators which briefly expained in fig.2 [6]. The City Prosperity Index (CPI) is, by deinition, a multidimensional index. Hence, the prosperity of a city is determined based on a collection of factors or dimensions that are related to conceptualizations of a prosperous city. Each dimension is composed of sub-dimensions, which are deined from a group of variables (or indicators) that are measured for each city. When sub-dimensions are made-up by two or more indicators, they are aggregated into one single value. Indicators are standardized using internationally-observed benchmark [7].The process to calculate the CPI is briefly expained in fig.3 [6].

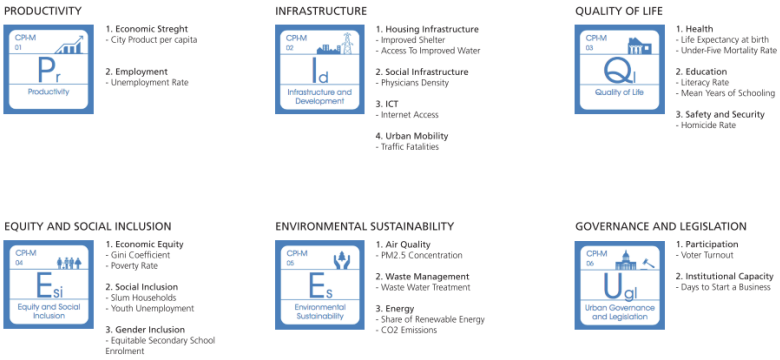

fig.2 Measurable Dimension of Each CPI Indicators

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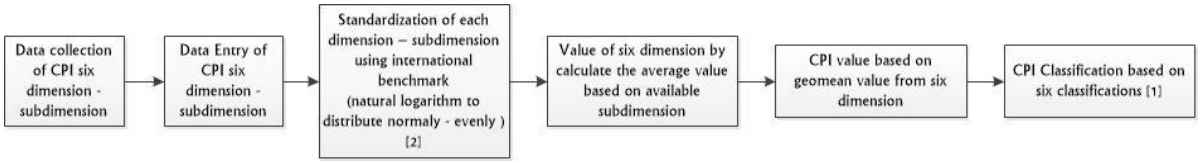

fig.3 CPI Calculation Process

Based on fig.3 data entry is done by using available data collection of CPI six dimension – subdimension. Therefore data entry has to get standardized by using international benchmark accordingly to available natural logarithm formula [7]. The next step after standardization of each dimension is calculate the average value of each dimension based on standardized value of each subdimension. Therefore the value of CPI gained by calculate geomean value from six dimension, and then the CPI value will be classified based on six classifications [6]. The calculation of each indicator with index unit will be averaged to classify the CPI of Malang City which consist of 6 classifications. The classification consists of very weak; weak; moderately weak; moderately solid; solid and very solid classifications which explained in fig.4.

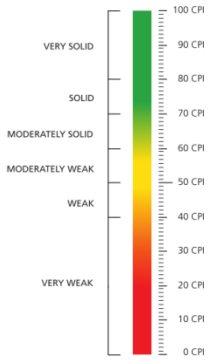

fig.4 Classifications of City Prosperity Index (CPI)

2.2. Results

The measurement of Malang City's current sustainability is done by gathering the necessary data to generate the Malang City's City Prosperity Index value. Data gathered based on subdimension of each CPI dimension is explained in Table.1

Table.1 Data Availability

Dimension	Subdimension	Value	Source
Productivity (Pr)	City Product per Capita	N/A	N/A
	Old Age Dependency Ratio	7,81	Malang Municipality in Figures 2016 [1]
	Economic Density ($/km^2)	290219	Malang Municipality Annual Performance Report 2015[3]
	Unemployment Rate (%)	7,28	Malang Municipality in Figures 2016 [1]
Infrastructure (Id)	Improved Shelter	N/A	N/A
	Access to Improved Water (%)	64	Malang Municipality Annual Performance Report 2015[3]
	Physicians Density (per 1000)	1,11	Malang Municipality in Figures 2016 [1]
	Internet Access (%)	N/A	N/A
	Traffic Fatalities (%)	13,38	Malang Municipality in Figures 2016 [1]
Quality of Life (Ql)	Life Expetancy at Birth (year)	71,14	Malang Municipality Annual Performance Report 2015[3]
	Under Five Mortality Rate (%)	0,57	Malang Municipality in Figures 2016 [1]
	Literacy Rate (%)	99,91	Malang Municipality Annual Performance Report 2015[3]
	Mean Years of Schooling	N/A	N/A
	Homicide Rate (%)	0,03	Malang Municipality in Figures 2016 [1]

Dimension	Subdimension	Value	Source
Equity and Social Inclusion (ESI)	Gini Coefficient	N/A	N/A
	Poverty Rate (%)	4,20	Malang Municipality Annual Performance Report 2015[3]
	Slum Households (%)	4,991	Malang Municipality Annual Performance Report 2015[3]
	Youth Unemployment (%)	7,28	Malang Municipality in Figures 2016 [1]
	Equitable Secondary School	N/A	N/A
Environmental Sustainability	PM 2.5 Concentration	N/A	N/A
	CO_2 Emissions (Metric Tonnes per Capita)	0,15	a. Qurrata, et.al. 2015. [5] b. Malang Municipality in Figures 2016 [1]
	Share of renewable energy	N/A	N/A
Urban Governance and Legislation	Voter Turnout (%)	35,19	kpud-malangkota.go.id (mayor election of Malang City year 2013) [2]
	Access to Public Information	N/A	N/A
	Days to Start a Business	N/A	N/A
Data Availability Rate	(Avaiable Subdimension Data / Maximum Number of CPI Subdimension) * 100	(17/25) * 100	64,00%

The CPI value of Malang City generated by standardization of available subdimension data value (based on Table 1) with 64,00% of data availability, using international benchmark accordingly to available natural logarithm formula [7]. Therefore the standardized value of each dimension generated by the average value of each dimension based on standardized value of each subdimension. Finally value of CPI gained by calculating geomean value from six dimension, then its value will be classified by CPI Classifications based in Fig.4. The CPI calculation process is explained in Table.2

Table 2 CPI Calculation Process

Dimension	Subdimension	Value	Standardized Value	CPI Dimension Value	CPI of Malang City
Productivity (Pr)	City Product per Capita	N/A	N/A	44,675	32,905 (very weak)
	Old Age Dependency Ratio	7,81	62,60		
	Economic Density	290219	65,36		
	Unemployment Rate	7,28	50,74		
Infrastructure (Id)	Improved Shelter	N/A	N/A	27,072	
	Access to Improved Water (%)	64	28,00		
	Physicians Density (per 1000)	1,11	35,55		
	Internet Access (%)	N/A	N/A		
	Traffic Fatalities	13,38	58,73		
Quality of Life (Ql)	Life Expetancy at Birth	71,14	58,14	97,229	
	Under Five Mortality Rate	0,57	130,60		
	Literacy Rate	99,91	100,00		
	Mean Years of Schooling	N/A	N/A		
	Homicide Rate	0,03	147,32		

Dimension	Subdimension	Value	Standardized Value	CPI Dimension Value	CPI of Malang City
Equity and Social Inclusion (ESI)	Gini Coefficient	N/A	N/A	29,517	32,905 (very weak)
	Poverty Rate	4,20	59,81		
	Slum Households	4,991	93,76		
	Youth Unemployment	7,28	23,53		
	Equitable Secondary School	N/A	N/A		
Environmental Sustainability	PM 2.5 Concentration	N/A	N/A	20,783	
	CO2 Emissions	0,15	83,13		
	Share of renewable energy	N/A	N/A		
Urban Governance and Legislation	Voter Turnout	35,19	35,190	17,595	
	Access to Public Information	N/A	N/A		
	Days to Start a Business	N/A	N/A		

Based on CPI calculation from Table 2, CPI value of Malang City is 32,905 which means its on very weak classification. Compared to CPI value of Jakarta which is 57,326 (weak) with 100% of data availability [7], it is still possible for Malang City (currently with 64,00% of data availability) to get better CPI value if the municipality had already measured and published the unavailable data of each subdimension. Surprisingly the value of Quality of Life dimension has the highest standardized value, while urban governance and legislation has the lowest standardized value. Therefore it will be quite a challange for Malang Municipality to achieve the 11th goal of SDGs by the end of 2030 if there is no proper strategies to measure and publish the current unavaiable data, and put some actions to improve the necessary dimension value. It is highly recommended for Malang Municipality to measure and publish the current unavailable data for short term strategies, and put some actions to improve the necessary dimension value by using proper strategies for long term strategies to achieve the sustainability as it is stated within 11th goals of SDGs.

2.3. Conclusion

The current sustainability of Malang City is measured by City Prosperity Index which act as a tool to measure the achieveness of a city regarding 11th goal of Sustainable Development Goals. CPI value of Malang City with 64,00% data availability rate is 32,905 (very weak classification). Therefore it is highly recommended for Malang Municipality to measure and publish the current unavailable data for short term strategies, and put some actions to improve the necessary dimension value by using proper strategies for long term strategies to achieve the sustainability based on 11th goals of SDGs.

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Part 3

Urban Studies

The 3rd International Conference Planning in the Era of Uncertainty:
Sustainable Nation

Cellular Automata Algorithm for Spatial Modelling of Urban Physical Development in Dubai, United Arab Emirates

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Abstract

Dubai is one of the most populous cities in the world that has rapid urban development in the last several years. Urban development identified from built up area development in Dubai. Landsat 7 ETM+ imagery (acquisition date in 2003) and Landsat 8 OLI (acquisition date in 2016) is useful for extraction an urban development data. Multispectral classification use to produced the spatial data of built up area from two periods (2003 and 2016). Urban development identified from monitoring the spatial data of built up area in two periods. *Cellular automata* used for predict built up area development in 2030 consider of urban development trend in several years before. The model also considering the driving factors of urban development, such as slope, primary roads, secondary-tertiary roads, and public facility. Result of spatial analysis present the spatial trend of urban development in 2003 – 2016 direct to south-western from city centre. Spatial statistical analysis explains than slope factor has a highest influence of urban development. Spatial modelling of urban development explains the development in 2030 is centralized. It caused by sparsely the spatial distribution of public facilities in suburban area.

Keywords: Built up area, urban development, Landsat, cellular automata, Dubai

1. Introduction

Urban area has primary activity in non-agriculture, as centre of government, social service and economy activity [1]. Based on geographic approach, [3] urban defined as a cultural landscape that released by natural components and non-natural components with society centralization, high heterogeneity and materialistic. Dubai is one of the most populous cities in the world that it has rapid urban development in last decade. About 1980, many people predicted economy sector of Dubai not optimal if they only focused in crude oil stock. Government and entrepreneur have to think to invest in other sector, one of them is real estate, nowadays real estate become a primary economy sector in Arab [2]. Control of urban development must consider for urban planning. Understanding of the urban physical characteristics is necessary in order to avoid the negative effects of the development of urban [12].

The problems appear when urban planning not used spatial data optimally. One of spatial data is satellite imagery that produced by remote sensing process. Remote sensing is information extraction method without contact with object [8]. Spatial data like satellite imagery able to identify of urban physical distribution and spatial trend of urban development. This is why remote sensing data like satellite imagery is useful [11]: a) can explain phenomena, region, and many tendency in earth surface manifestly; b) remote sensing data has large coverage area and permanent data recording; c) can observed through a stereoscopic observation, be visible 3D effect; d) able to explain about condition of location or area that not able explored by terrestrial survey.

This study aims to identify the change of urban land cover, explain intensity of urban physical development, and predict urban development in the future (especially in 2030). The aims achieve by integration of remote sensing and Geographic Information System (GIS). Interpretation of urban land cover using pixel based classification of Landsat imagery. Monitoring of urban land cover using change analysis from multitemporal land cover classification. Prediction of urban physical development using cellular automata model. The model made consider spatial trend of urban development and infuence factors. The factors such as slope, main roads, non main roads, and public facilities. *Cellular automata* used in this study because have been widely used for environmental simulation like modeling land features dynamics [7]. The result of this study provided the area of land use changes disribution and direction in 2003 untill 2016. Land use prediction in 2030 use to efforts the urban management in minimize the uncontrol physical

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development in the future. The spatial model of urban development in the future expected able to give information about highest factor that influence urban development and expected become reference for urban planning.

2. Methods

This study area is Dubai as the one of the greatest cities in the world. Dubai has rapid urban development in last several years. Materials that used in this study are, (1) Landsat 7 ETM+ imagery acquisition in May 2003, spatial resolution 30 meters; (2) Landsat 8 OLI acquisition in September 2016, spatial resolution 30 meters; (3) Digital Elevation Model (DEM) data; and (4) Spatial data of roads network and public facilities.

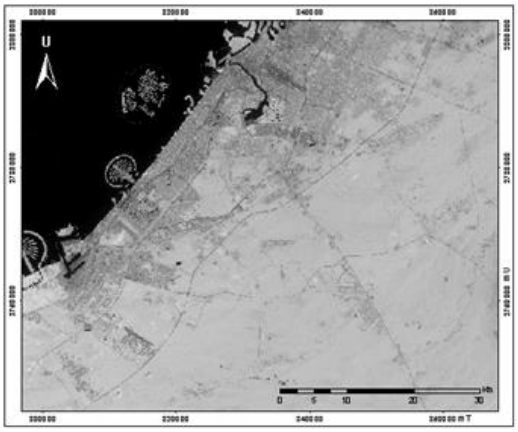

Fig. 1. Study area, Dubai, United Arab Emirates.

Imagery is still corrected in geometry, but not corrected in radiometric. In this study, radiometric correction is not used because classification based on spectral pattern distribution not in spectral value. The quality of imagery see from the presentation of cloud cover.

2.1. Built up data extraction

Landsat 7 ETM+ (acquisition date in 2003) and Landsat 8 OLI (acquisition date in 2016) extracted to get land cover information. Classification of land cover in the first level divided into four class, include water, vegetation, open land, and built up land. But, in this study classification of land cover are conducted into built up and non-built up area. The spatial data extractes using multispectral algoritm classification, it was maximum likelihood. This algorithm applied to processes land cover classification based on pixel analysis. Election of Region of Interest (ROI) become an important step in the multispectral classification.

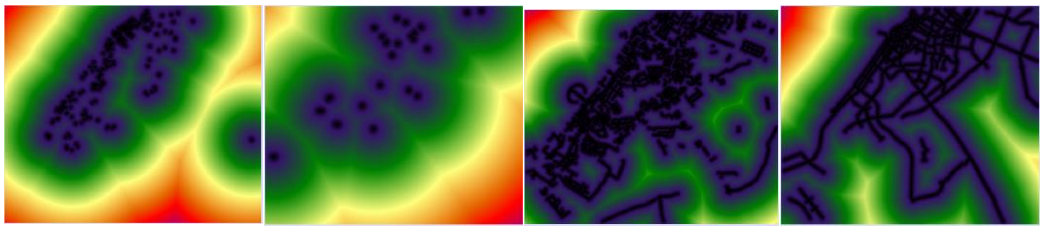

Fig. 2. Spatial data of (a) built up area in 2003; (b) built up area in 2016

Settlement patterns tend to be linear because the existence of the sea in the west Dubai as a barrier of urban development. The development not sporadically occured in any direction influenced by sand materials that composed the land

2.2. Urban development analysis

Spatial distribution pattern and land cover changes known using a multitemporal approach. This approach applied in two spatial data with a different of time period to analize the urban development. Land cover monitoring used for

monitor the built up area using TerrSet software. This result can identify the spatial distribution of new built up area and show the changes in 2003 till 2016. Identification of urban development trend based on conversion of non built up to built up area. Conversion of non built up to built up area in thirteen periods occured in the back of built up land in 2013 and batch area.

Slope is the physical componen of land that directly influence the activities in an area. Development of built up area always consider the slope as one of the requirement of built up area or settlement. Road networks has also become driving factors because it is one of the sources of accessibility. Physical urban development indentic with human activities that closed into road networks.

2.3. Spatial trend analysis

Spatial trend of the physical urban development automatic identified using *TerrSet* software. The trends see from the area and direction of built up changes. Spatial process of the development trend built from the spread of built up area data in two periods. The result of trend analysis show the development of built up area in all direction with different intensity. The most rapid development of built up area occured from the center of city to the south west influence by Abu Dabi City as the capital city of United Arab Emirates. Urban physical development in the north west occured more slowly influence by Persia Bay as the barrier of development.

Determination and recommendation urban development priority in the future needs to achieve the equitable development of the city that followed by equitable of community services. The most proper recommendation for urban development planning are in the south east and north east of the city center. The physical condition of this area are composed by sand materials like in the south west, south, and east that more developed before.

2.4. Urban development prediction in 2030

Prediction the spatial model of urban development in this study made for 2030 using with *cellular automata algorithm*. This algorithm is one of the optimum method in applied remote sensing, especially in simulation processing of satelite imagery. *Cellular automata* have been widely developed in environmental modelling, such as land dynamic. Development of the urban area caused by some driving factors, such as slope, primary roads, secondary-tertiary roads, and public facilities. The distance of each factors identified using *euclidean distance analysis*. Assumtion that use in this process are the area that located near the roads or public facilities has high probability of changes to be built up area.

Spatial modelling of physical development carried on the probability of changes. The probability values measured by influence of driving factors of the physical urban development in each study area. Result of the modelling indicate that the most possibilities from non built up to buil up area until the year of 2030 will occur in the flat untill gently slope area. This is caused by availability of road networks and existing of public facilities.

Slope is the most driving factors tha influence the physical urban development eith relevance weigh reached 0.86. Public facilities is the littles of influental factors with the relevance weigh about 0.4. The high different of the influence rate occured because slope is the natural aspects that very limited the built up development in the not suitable slope.

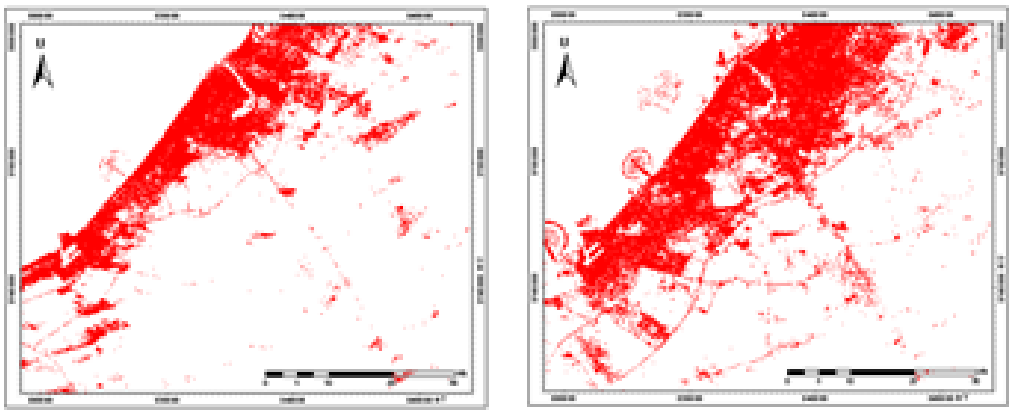

Fig. 3. (a) primary street; (b) secondary-tertiary street; (c) and (d) public facilities

Spatial pattern of built up area in 2030 is not so different with the existing built up area in 2016. The visible changes that occured are expansion of the built up area and increasing of built up density. This condition can occurs in the center and surounding of the city centre. Increasing the dencity of city may be occur that influence by accessibility of roads and public facilities.

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The Centrifugal and Centripetal Force Influence on Spatial Competition of Agricultural Land in Bandung Metropolitan Region

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Abstract

As one of the most important economic activity in Bandung metropolitan region, agricultural activity has suffered massive land functional shift caused by market mechanism. In such case, we argue that the existence of agricultural land in urban spatial structure is the result of interaction between centrifugal and centripetal force on spatial competition. This research aim to explore how several recognized centrifugal and centripetal force influence to the existence of agricultural land in Bandung metropolitan region land development. The analysis using spatial regression models indicate that the existence of agricultural land at the location of study is affected by population density and degree of urbanization, as well as the amount of agricultural land in its neighbouring locations. Meanwhile, the distance between the location of the city centre and employment opportunities is not significant in affecting agricultural land available. It is opposed to the theory of Von Thunnen and monocentric model in general. One of the possible explanation of such condition is that the assumption of centrally located market does not met. In addition, the agricultural land density decay in the southern parts of the area was related to its geographical conditions as protected areas or unfavourable for farming activity. It was suggested that Bandung metropolitan region was at the early phase of polycentric development. Hence, better policies that lead redirected development to the southern part of the region is needed as well as population control and regulation of land use.

Keywords: agricultural land; centrifugal and centripetal force; spatial competition

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1. Introduction

Indonesia has experiencing rapid economic growth by transforming its national development policy to modern industry. One of the major agglomeration of industrial activity, especially on the textile industry is located in Bandung Metropolitan Region (BMR) [1]. Bandung Metropolitan Region initially consists of two areas: the city of Bandung as core and its surrounded periphery region. It was administratively divide into three regency and a city, and became the third largest metropolitan region in Indonesia. Its recent urban development has a unique pattern of leap frog sprawl phenomena which correlate slope/topography, accessibility and location to the urban development direction [2]. This contribute to spatial mismatch of population growth trend and employment growth trends, namely disagreement between the population and employment center locations [3]. To cope with these problems the government has adopted a policy of counter magnet development, aimed at decentralizing the urban economic activities from Bandung City to its surrounding small towns, particularly Soreang, Majalaya, Banjaran, Padalarang and Ujung Berung [1].

Urban land use has becoming one of the main issue in Indonesia's urban land development. Recent urban development was followed by land use changes in the urban area and conversion of prime agricultural land to residential as well as other urban function in the peripheries [4]. The problems faced by Bandung metropolitan region which has suffered massive land functional shift of agricultural activity. Having 340,000 hectares of area and 8.25 million of population, Bandung metropolitan region facing serious shrinkage of agricultural land. The data from agricultural census showed that the number of agricultural activity in the region during the decade of 2003-2013 decreased by 22.75 percent, with about 84 percent of whom are smallholders. The conversion has not only taken place in the prime agricultural land of the urban fringe, but has also occurred on land designated as conservation areas, such as Northern Bandung [5]. This result not only could endanger food security but also have a detrimental impacts on the environment.

As a human process, land use change is affected by spatial interaction [6]. Gravity model as the most widely used type of spatial interaction model interrelate two basic element which influencing land use change: scale (mass factors) and distance. The land use change in the urban area shows that it was a dynamic organism constantly in process of evolution, which involve both modification of long established function and the addition of new function. Among the forces that determine the urban function, form, and pattern, two groups stand prominently [7]. The first group is made up centrifugal forces to migrate from the urban center towards, and the second is centripetal force that promote agglomeration in the center. With regard to the importance of location in market mechanism, empirical result has shows its relation with urban structure dynamics (see [8]–[11] for example). Since the influence of each of these factors would be differ depends on the context of the location, therefore it was important to recognize the effect of the two force on the shape of urban spatial structure.

Urban spatial structures are shaped by market forces interacting with regulations, primary infrastructure investments and taxes [12]. [13] consider that the urban-rural land conversion was a special case of the more general equilibrium location of firms in a von Thunen plain changes in the condition of demand and supply for the commodities they produce. [14] argue that this theory is appropriate to explaining the loss of agricultural land to non-agricultural uses. From the perspective of classic theory, the monopolistic power of a firm against other within an area is determined from its production and transportation cost [15]. While production cost is tend to be fixed, firms minimizing its cost by simultaneously choosing the location which could reduce transportation expenses. Since land resource is immobile and the market located within specific area, whole economics stakeholder such as household, farm, and firm will always compete for the most strategic spatial environment [16], known as spatial competition.

The integration of urban agriculture into urban economic system and urban ecosystems compete in acquiring land with other urban functions, affected by planning and urban policy [17]. In such case, we argue that the existence of agricultural land in urban spatial structure is the result of interaction between centrifugal and centripetal force on spatial competition. Therefore, the protection of agricultural land is a challenge for spatial planning in the urban area that requires special handling strategy. The policy making need an accurate information on the extent of linkage characteristic of the spatial structure of urban land use against the competition. Nevertheless, research on spatial competition that is done in this area still has not received much attention. This research aim to provide empirical proof of how several centrifugal and centripetal force believed to explain the existence of agricultural land as a result of spatial competition in Bandung metropolitan region.

This paper is organized into four parts. The first part discusses the issue of agricultural land as a competition spatial form of land use in the metropolitan area of Bandung. The second part is a review of the literature about factors that affect land use change and the structure of the city. The third section is a discussion of the methodology used and the results of the analysis. In the last part, conclusion and some appropriate policy recommendations is proposed for strengthening the protection of agricultural land.

2. Methods

We have identify several factors representing centrifugal and centripetal force of urban evolution which assumed to have influence to the existence of agricultural land in Bandung metropolitan region. These factors include distance and population density [8]–[11], as well as the level of urbanization [8]–[10] and employment [8], [9], [11]. Although such literature came from distinct model of urban structure, but the study of the morphology for the whole area of the location study has so far not provided. However, we have informed that urban economics decentralizing policy does not work effectively, so that the city of Bandung, the core of BMR, has grown faster than the small towns surround [1]. This imply that the city of Bandung played as center of gravity of for surrounded areas, or in other word, BMR was monocentric.

Due to the data limitation, our object of research is smaller compared to the area of Bandung metropolitan region which described in [1], since we exclude the district located in Sumedang Regency. Analysis was performed using regression method with the addition of spatial effects, on sub districts level. We construct hypothesis that these four factors have a significant influence in affecting the agricultural land in the metropolitan area of Bandung. Each data used here is considered to be a representation, or as an approach of its actual figure. The analysis is conducted using software FreeGeeoda. The whole data collected from National Statistics Agency, but since the data on sub districts level available only on different census, then the time span used in this research was also vary.

Table 1. The Description of Variable Used In Linear Regression Modeling

Variable Type	Variable Name	Brief description of data used	Notation
Dependent variable	Agricultural land area ratio	The percentage of agricultural land area compared to the entire land area (%)	Y
Independent variable	Distance	Straight centroid distance to the central business district of Bandung (Km)	X_1
	Density	Number of inhabitants per Km^2 (person)	X_2
	Urbanization	The percentage of in-migrate residents on years 2005-2010 against the total population in 2010 (%)	X_3
	Employment opportunity	Growth in the number of non-agricultural businesses during the years 2006-2016 (%)	X_4

3. Results

At first, we made linear regression model from the data and check its assumption.

$$Y = 40{,}98 - 0{,}14\,X_1 - 0{,}001\,X_2 - 1{,}22\,X_3 + 0{,}052\,X_4 + \varepsilon \qquad (1)$$

Model (1) indicate that there were linear relationship between the agricultural land area and the centrifugal and centripetal force. Partial examination on each variables shows that only density and migration variables to have significant influence on the agricultural land area. The whole assumptions are met, but the variation of the force which could explained is only 48,76 percent, which seems to be less favorable. This suggest that there might be other factors which could explain the variation of dependent variables.

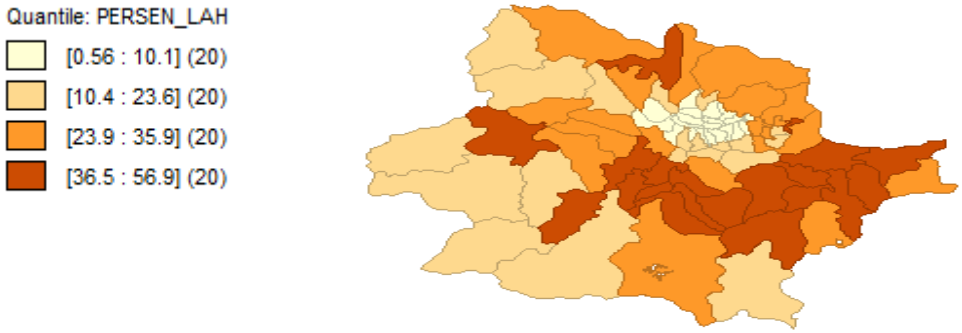

Fig. 1. Spatial pattern of district's agricultural land area in Bandung Metropolitan Region, 2013 (percent)

The analysis of spatial effect test shows that Moran's Index is very significant. We choose Queen contiguity to determine each districts neighborhood due to the nature of the border between districts. This indicate that there are significant spatial variations, which could verify of visual interpretation on Figure 1. The Lagrange Multiplier (LM) for a lag effect and the effect of error both showed a significant result. However, examination of Robust (LM) found that a lag effect has statistically significant while the error effect is not. It can be concluded that the spatial model used is the spatial lag as in equation (2). Because it is not statistically significant in explaining variation of agricultural land area, the distance and employment opportunities variables is excluded from the spatial regression model.

$$Y = 0{,}372WY + 24{,}65 - 0{,}0007\,X_2 - 0{,}69\,X_3 + \varepsilon \qquad (2)$$

Model (2) has smaller value of AIC and SC so that it can provide better estimation results than the linear regression. The whole assumption regression has also been met so that the model fit for use. With concluded that the amount of agricultural land at a site in Bandung metropolitan region could be determined by population density and degree of urbanization, as well as the amount of agricultural land areas in neighboring locations. Higher population density and urbanization would give negative impact to the existence of agricultural land area, while the presence of the area on neighboring district would make opposite impact of spatial effect test shows that Moran's Index is very significant.

4. Conclusion

In urban areas, the existence of agricultural land is the result of spatial competition mainly driven by market mechanism. Bandung metropolitan region has suffered massive agricultural land use shift to non-agricultural function. In such case we argue that there were several centripetal and centrifugal force characteristics which has contribute to the existence of agricultural land in Bandung metropolitan region. The Characteristics assumed to affect the existence of agricultural land area in a location include distance and population density, as well as the level of urbanization and employment opportunity. We use linear regression method with the addition of spatial effects to verify of how the whole and each factors influence to the area of agricultural land in the region. Assuming the city of Bandung as center gravity for surrounded areas, we choose monocentric models as analysis base.

The Result indicate that there are linearly negative relation between the existence of agricultural land area in Bandung metropolitan region with current population density and degree of urbanization, as well as the existence of agricultural land is in neighboring locations. Meanwhile, the distance between the location of the city center and the employment opportunities available in the non-agricultural sector in each locations, is not statistically significant in affecting available agricultural land area. With regard to the theory of Von Thunnen and monocentric, the finding on distance factors seems to be opposed. One of the possible explanation of such condition is that the assumption of centrally located market or business district does not met. The agricultural land area density decay in the southern parts of the area affected by its geographical conditions as protected areas or being unfavorable for farming activity. This support the argument of leap frog sprawl phenomenon of land development, which has divide market and employment concentration to several location within.

Contrary to the argument of failing implementation of counter magnet policy, we believe that Bandung metropolitan region has actually at the early phase of polycentric development. However, it must be admit that spatial

mismatch could not be avoided due to the lack of infrastructure which connect between center within the region. It was suggested a need of policy that lead to population control and provide regulation of land use within the radius of 5 to 15 km from the city center to maintain agricultural areas. The direction of development should deployed towards rural areas behind the agriculture land concentration, for example Ciwidey or Rongga sub districts. Through these policies is expected that the new growth center not only can reduce the socio-economic impact, but can bring progress to the region bordering on the southwest. At the same time it needs the support of Bandung metropolitan region infrastructure plan which mainly supported development in the south area of the metropolitan region. The planned infrastructures should be more compact due to the physical morphology of the Bandung basin area. The development in the north should be limited as well because there is a tendency to form population centers while there is a hill area [3].

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The 3rd International Conference Planning in the Era of Uncertainty:
Sustainable Nation

Malioboro as a Value of Special District of Yogyakarta City

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Abstract

Yogyakarta is a province that has a status as a Special District. The specialty of Yogyakarta is set based on its history, because it was led by the Noble and has social culture embedded with Javanese tradition. Recently, the development of Yogyakarta has changed, along with the dynamics urban activities and technologies, into a tourist destination. It is a challenge to enhance the status of 'privilege' of Yogyakarta.

Malioboro is an important part in the structure of the city of Yogyakarta. Apart from being one of the constituent elements of the north-south axis, Malioboro also serves as a public space that is rich in cultural activities, economic and social interaction. If it reviewed according to its privileges, Malioboro is one part of the city of Yogyakarta which has an important role in maintaining local values that forms the privilege character of Yogyakarta.

As a city that responds to the needs of the society, Yogyakarta provides various supporting infrastructure. Maliboro is located at a strategic area that became the target of investors as site to build public and commercial facilities. Malioboro is an iconic street of Yogyakarta, become one of the tourist destination because of its uniqueness, especially as the affordable shopping area. For that reason, it is necessary to study how Malioboro should maintain its local value to conserve the privilege of Yogyakarta as a special district, but also has ability to adapt nowadays development of Yogyakarta City.

This paper will provide the study about the values of Malioboro which conserve the status and the meaning of the privileges for Yogyakarta, when viewed from the historical, social and cultural. It will continue the discussion about the development of tourism and economic activities that are affected by tourist's demand. The result of the paper will describe (1) the aspects that we have to keep to conserve the privilege of Special District of Yogyakarta and (2) the aspects that we can change or adapt, so that Malioboro continue to develop its role as an iconic street. The study will provide an alternative perspective for Malioboro's development.

Keywords: Special District of Yogyakarta; privilege area; Malioboro; urban tourism; urban structure

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1. Introduction

The dynamics of live in the city continue to change with the times that influenced by human needs. In the main time of urban development, the city needs a plan that can be developed with human needs and support human activities. Some experts have given their opinions and the theory about urban design, some of them are Roger Trancik with Finding Lost Space (1986) [4] and Kevin A. Lynch in his book Image of The City (1960) [2].

Yogyakarta when viewed through the theory from Finding Lost Space (1986) [4] and Image of The City (1960) [2] will generate a unique urban design and certainly different from the other cities. Yogyakarta itself administrative own uniqueness, namely the status of Special Region. That's because the governor of the Yogyakarta area is held by hereditary of the Sultanate of Yogyakarta. With its status, Yogyakarta develop into areas that were not merely administrative privilege but also special because of the customs and traditions of Javanese culture and natural beauty. Malioboro is an important part in the structure of the city of Yogyakarta. Apart from being one of the constituent elements of the north-south axis, Malioboro also serves as a public space that is rich in cultural activities, economic and social interaction. Many old buildings with spesific detail are lined up along the street, malioboro is not only as a street, but also as a withness of historical aspect of Yogyakarta urban development [3]. If the terms of the privileges, Malioboro is one part of the city of Yogyakarta which has an important role in maintaining local values are becoming forming the character of the privilege of Yogyakarta.

2. Methods

The research use primary data form the site which is collected during survey and observation. The research use qualitative method and use single case study as research approach [1]. Malioboro is the site which is investigate as one place that emerge the 'speciality' factor of Special District of Yogyakarta (*Daerah Istimewa Yogyakarta, DIY*), because as a great street of Yogyakarta, it has specific character, not only as a path but also as a linkage and as a place. The paper will focus on the architectural elements of Malioboro that has a dominant impact on the image of Malioboro, so that it could carry on its role as a great street, not only as a street but also as a commercial area, tourism spot and the most important is as an element that strengthen the character for Special District of Yogyakarta.

3. Results

In urban life, the street become one of the important roles. Not only as a physical element, but the street is also a space/place for people to do their activities [5]. In a city, the street can be metaphor as the lifeblood. Because through the street, all the activities of the city flowed. By street which is a public space, there are a lot of social and cultural interaction. Through the street all human activities can be connected and human able to move the wheels of the economy and social relations in a city.

Streets in urban areas not only as a current passing for human activities, urban street developed into the economic places, business places, tourist places, commercial places, public places, social place, and even transformed into a symbolic space for a particular area. Streets especially in the Asian region has become part of the culture and tradition of the people, since a long time streets become part of the public space. In urban areas can be seen that along the street, there are a lot of informal sector, such as the emergence of street vendors [5].That's because along the side of the streets are always have potential as a gathering place for humans.

Relation to the urban design, streets can be connected with the theory stated by Roger Trancik (1986) in his book Finding Lost Space [4], the Linkage theory that explains the dynamics of circulation becoming generator in the city forming. The streets is also a role as human circulation and helps the movement of people, as well as connecting the dots in a particular city.

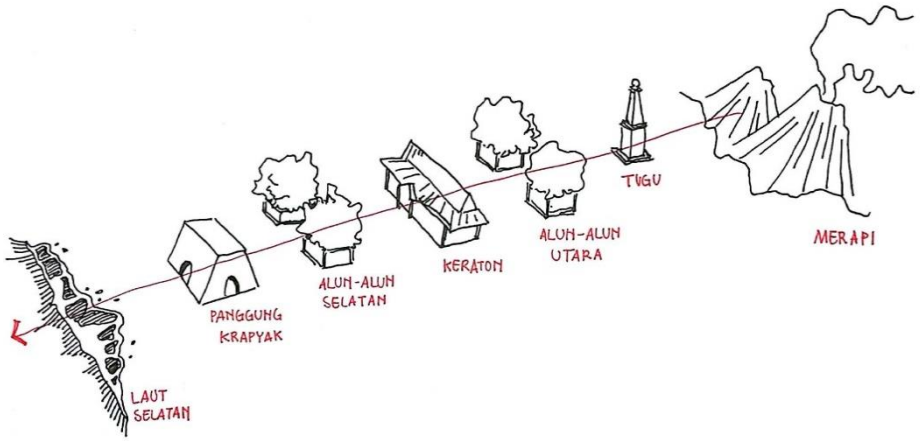

Fig. 1. Imaginary Axis Image

The same thing happened in the malioboro street that located in the center of Yogyakarta, Malioboro itself located parallel between Tugu and Keraton who passed the imaginary axis as a link between the volcano, Keraton and the south beach. For the people of Yogyakarta Malioboro street not just as a connecting street, but also as a place for human activity [5]. Around the malioboro can be found in economic activity, social, cultural and tourism.

Since ancient times, around the 19th century, Malioboro is built as a government and economic center by the Dutch colonial government. Since old times, malioboro street is known as a shopping center and the economy center, because in Malioboro besides the shops there are also Bringhardjo market. Commodity sold on the malioboro street mostly accessories and souvenir. In malioboro street are famous for shopping, there are shopping activities are socially indistinguishable from traditional and modern shopping activity. Known traditional shopping activity because there are still haggling on the stalls of street vendors and modern shopping activity happend in the mall located on the malioboro street, in the mall the goods have been pegged at a price that fits, and there is a classification of goods.

In addition to economic activity, on the malioboro street, there are also take place for social activity, because as a public space, malioboro be a place of social interaction for people of Yogyakarta with people who come to visit there. With combination of social activities there, making people who come to malioboro can recognize faces of Yogyakarta through the interaction with the people who were there. In the Malioboro street is also a place for culture activity, because in Malioboro Street mixed various cultures. As the township Chinatowns in Ketandan, as well as buildings with colonial-style architecture, and the people of Yogyakarta who uphold the traditional Javanese and also domestic tourists and international tourists who visit there add more various cultures in malioboro street. Malioboro as a famous street in Yogyakarta, capable of being a symbolic space for the city of Yogyakarta [5], it can be seen from the many cultural events, or other events that concentrate on Malioboro street and the event even become identicals with malioboro street. For the example the event that held in malioboro street is the Chinese New Year celebration event, carnival, also the other special ceremony.

The number of human activities that occur in malioboro with cultural values, social and economic, making the tourism potential of the region malioboro become stronger, and able to be an attraction for the city of Yogyakarta. But along with the times and technology, especially in the field of transportation and the investors who make their investment malioboro region, turned Malioboro turned into a commercial area and the tourist area. Before new design of pedestrian ways of malioboro nowdays, a lot of both the motor vehicle and a car parked along the malioboro street. Increasing the volume of the vehicle also makes the area malioboro becoming increasingly congested and avoiding by the people of Yogyakarta itself, because it is known for the density and traffic jams. Besaide that, the construction of facilities for tourists such as hotels malioboro region also increased the density in the area.

Fig. 2. (a) Malioboro in the past (b) Malioboro 2015 (c) Malioboro nowadays

It is changing the habits of interaction in the malioboro streets, people being oriented into vehicle. No longer enjoying the experience of walking in malioboro. But now, the area of Malioboro street began to repair, the most significant change was the side of the road. The arrangement which prioritizes pedestrian and the vehicle parking was move to the north side of the malioboro streets.

With values and human activity at malioboro, malioboro is able to provide a special atsmosfer of malioboro street and the city of Yogyakarta. Surely the atmosphere cannot be found in other streets. Uniqueness at Malioboro Street can be maintained with attention to cultural, social and economic. [4] also explains one of urban design theory that Place theory emphasizes the importance of its historical, cultural and social values on an open area in the city, as well as maintains a sense of urban space. Doing the development in Malioboro, we need to pay attention to the cultural aspects of standard rule in the construction, as well as the models of the buildings that remain in tune with malioboro current building (colonial style and Java), so that you can physically bring a nostalgic memories from the past in the area of Malioboro street. Socially is also note that malioboro from time to time is a place for humans, and the development of malioboro still able to maintained public spaces for the community.

By maintaining the values of local wisdom in Malioboro Street, we will be able to continue to maintain the privilege of Malioboro Street, which will eventually be able to strengthen the image of Yogyakarta.

4. Conclusion

Street is one elements of the city, where we can find the historical side of the city. On their theory, [2] and [4] put street as a path [2], as avoid, as a linkage and as a place [4]. They give the base point for us to learn how the urban street, like Malioboro, run its role in urban scale.

Malioboro has layers of information, layers its roles and layer of its users. So, if there is a new development that applied on Malioboro, it should consider the layers that embedded on it. Learning from the Maliboro, that the street is not valued by it dimension and the physic of old building, because people who come to Malioboro not because of them. The layer of activities that connecting the street, the building, the pedestrian and the people. We can see the difference of elements of Malioboro from time to time, but we still can see the atmosphere that describe the dynamic of specialty aspects of District of Yogyakarta.

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The 3rd International Conference Planning in the Era of Uncertainty:
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Way finding Concept in University of Brawijaya

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Abstract

Wayfinding is an activity related to the orientation and motion from first point to point of destination. Benefits of wayfinding in the area of education, namely as a means of helping direct a person to a destination so as to reduce the lostness and assist users in remembering the way through the role of space and objects wayfinding. Around 48% new students of University of Brawijaya (UB) 2015 that ever lost when entering the campus. This shows the need for wayfinding concept to someone who was unfamiliar with the surrounding area as freshmen. This study uses mental map analysis to find the objects hierarchy wayfinding determination based on the respondents and the space syntax (visual graph analysis) as a hierarchy based on the determination of the configuration space. The overlay result say that hierarchy between both of analysis shows there are several objects which are potentially in wayfinding process on the campus of UB. The concept of wayfinding generate different treatment of the selected object based of wayfinding classification, both in maintaining the function of the object in space and develop the potential of the object wayfinding.

Keywords: wayfinding; mental-map; space-syntax; Brawijaya-University

1. Introduction

Wayfinding is an activity related to the orientation and movement from one place to another [5]. In Brawijaya University (UB), the increase number of new students affect the movement of existing activities on campus, such as the addition of infrastructure, road widening, and a variety of construction of new buildings. This affects difficulty in identifying the space to wayfinding in UB, especially new students who are unfamiliar with their surroundings. Based on the survey, 48% of new students UB 2015 ever lost when entering the university. Difficulties and confusion for new students in finding a place that became a destination within the campus became the main idea in this study. Process- oriented and wayfinding related to several factors, namely the capacity of people, processes and cognitive maps awakened in the mind of the individual, and the role of environmental information, includes architectural wayfinding element, signage system, and other sensory information [4]. Architectural wayfinding elements identified by a) path and circulation; b) landmarks or markers; c) nodes; d) edges; and e) districts or zones [5]. In urban design elements, there is one sign or signage elements of architectural design as a form of information and orientation of the city [9]. Then role of wayfinding support in other sensory information, such as the shape of paving sidewalks, street lights, and vegetation can help users in the process of wayfinding [1].

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2. Methods

This study identifying the object condition as the wayfinding elements common in UB. Then identify wayfinding objects by the experts and respondents whose based on object from the variable architectural wayfinding elements (path, edge, zone, node, and landmark), while for the supporting wayfinding elements, such as signage and other sensory information, are include in questionnaire directed to new students of UB. Retrieving the data using mental map analysis to determine the hierarchy of objects by the respondents as well as a questionnaire on the supporting wayfinding elements. The hierarchy of mental map is obtained by comparison scores by the result of questionnaire mental map that consist of criteria from each elements. The hierarchy of space syntax is obtained by comparison between average of imaginary point score from each objects in wayfinding element. Then do a clasification and comparison between the hierarchy of objects by mental map and the spatial configuration hierarchy by space syntax (VGA).

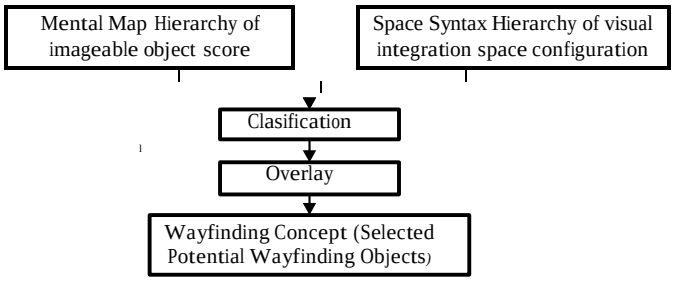

Fig. 1. Line of research methodology

3. Results

The results of this study based on the analysis of space syntax mental map and associated mental images and other supporting elements such as signage systems and other sensory information. Result form this studies contain of potential wayfinding objects from each elements to support wayfinding activities for new students in Brawijaya University.

3.1. Space Syntax

In wayfinding concept study in UB's campus, researchers use the application Depthmap 0.30, with a base map of UB in dxf format from AutoCAD. Results obtained from the analysis is the distribution of color resulting from an imaginary point that describes the visual gradation integration in UB. The red color means that the high value of visual integration, and lower value for blue in gradation**.**

Fig. 2. Space syntax output (visual integration in UB)

3.2. Mental Map

Results mental map in the form of hierarchy obtained from the results of the questionnaire respondents. Results hierarchy is then converted to a map and get the highest level of visualization objects based on user opinions. The explanation about mental map will be discussed in every elements of wayfinding in UB.

A. Path

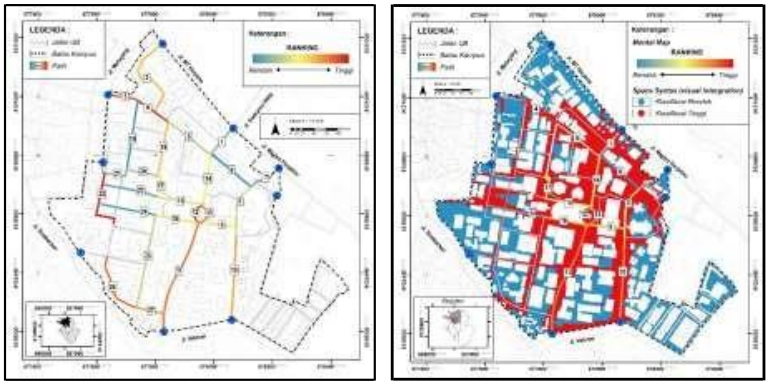

Fig. 3. (a) Visualitation Paths of Mental Map ; (b) Overlay Path Mental Map and Space Syntax

Before analysis, path element has 28 objects obtained from the experts and respondents. After the overlay, path has 15 objects that is potential to become wayfinding objects. The treatment for path elements has 5 objects that only need to be maintained or strengthened, such as Path 4, 10, 11, 12, and 13, and 10 other objects that have the potential to be developed into main wayfinding, the Path 1, 5, 6, 8, 9, 14 , 15, 16, 17, and 24.

B. Edge

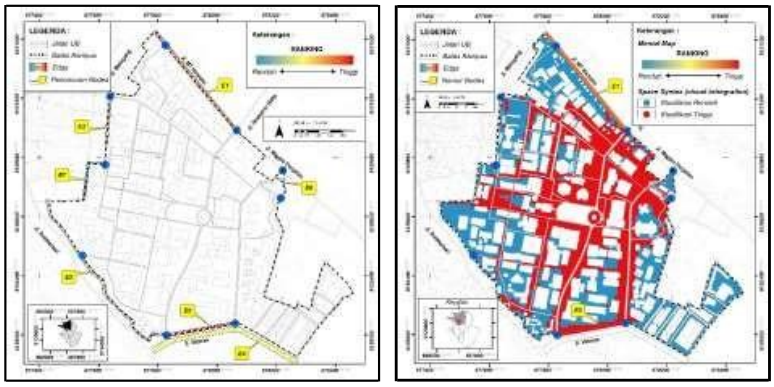

Fig. 4. (a) Visualitation Edge of Mental Map ; (b) Overlay Edge Mental Map and Space Syntax

The survey shows that there are 7 objects that include as the wayfinding elements. After the overlay process, there are only 2 edges which is the mark as the potential wayfinding. The treatment for that edges need to be maintained or strengthened as wayfinding objects in UB space, such as Edge 1 and Edge 2.

C. Zone

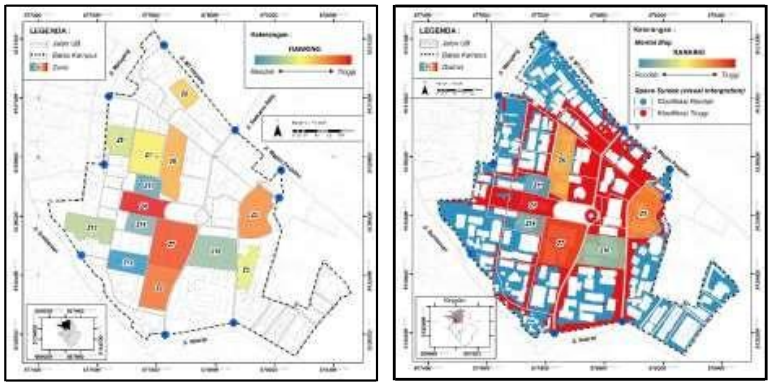

Fig. 5. (a) Visualitation Zone of Mental Map ; (b) Overlay Zone Mental Map and Space Syntax

Zone element has 14 objects obtained from the experts and respondents. After the overlay, zone has 7 objects that is potential to become wayfinding objects. The treatment for zone elements has 4 objects that need to be maintained or strengthened, such as Zone 4, 5, 6, and 7, and 3 other objects that have the potential to be developed into main wayfinding, the Zone 10, 11, and 14.

D. Node

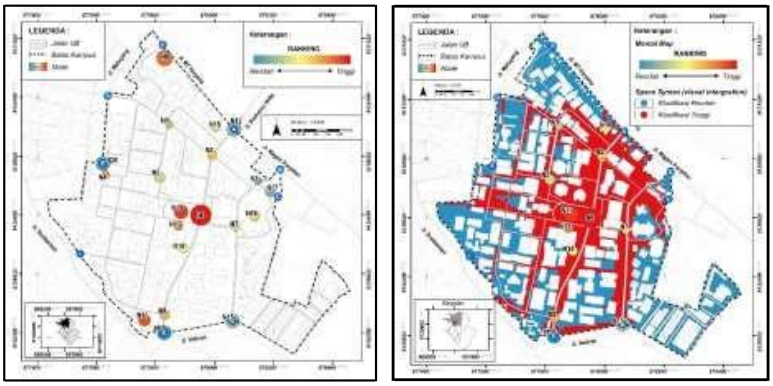

Fig. 6. (a) Visualitation Node of Mental Map ; (b) Overlay Node Mental Map and Space Syntax

Node element has 20 objects obtained from the experts and respondents. After the overlay, node has 12 objects that is potential to become wayfinding objects. The treatment for node elements has 3 objects that need to be maintained or strengthened, such as Node 6, 10, and 13, and 9 other objects that have the potential to be developed into main wayfinding, the Node 1, 2, 5, 7, 8, 14, 15, 18 and 19.

E. Landmark

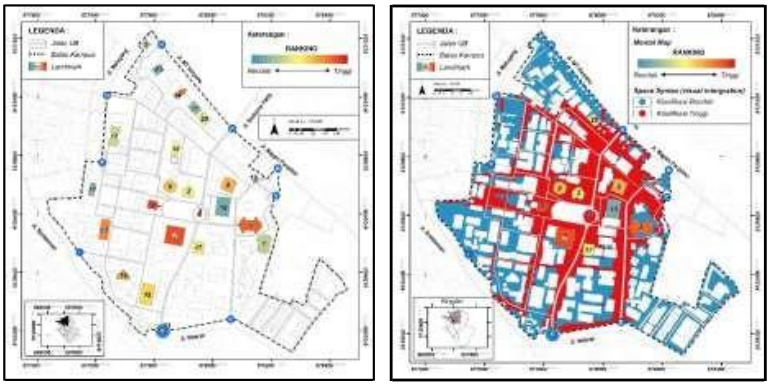

Fig. 7. (a) Visualitation Landmark of Mental Map ; (b) Overlay Landmark Mental Map and Space Syntax

The survey shows that there are 23 landmark objects that include as the wayfinding objects. After the overlay process, there are 12 objects which is the mark as the potential wayfinding. The treatment for landmark elements has 6 objects that need to be maintained or strengthened, such as Landmark 4, 5, 6, 7, 8, and 9, and 6 other objects that have the potential to be developed into main wayfinding, the Landmark 2, 17, 18, 19, 20 and 23.

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Human Settlement Improvements In Kota Tua With Green And Clean Approach, Case Study: Kelurahan Pinangsia, Kecamatan Taman Sari, Jakarta Barat

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Abstract

Jakarta is the destination the immigrants from various regions who wish to improve their lives. They caused the population density in Jakarta increase every year that affect the deterioration of the quality of housing in some areas. The Local Government has a wide range of policies to reduce the level slum condition, started from organizing of the river bank, revitalizating of green areas, controlling land use and the last one to establish "Kampong Deret".

One forms is acceleration for improvements the settlement area is physical improvements of human settlement and economic improvement based on community empowerment. But in addition to the economic empowerment by improving the environment there is an alternative which was considered quite friendly to people and the environment is, the Green and Clean approach. These concept emphasizes on composting activities where this concept not only improve the quality of the environment and increasing people's income but bring a sense of pride the local communities.

Pinangsia is one of the "Kelurahan" which are slums in Jakarta Barat, quite close to the Kota Tua area, to revitalize by the concept of Green and Clean approach. Which this concept considered quite environmentally friendly and acceptable to the society in general without causing conflicts.

Keywords: green and clean; revitalization; settlement; quality improvement

1. Introduction

Area of settlement in DKI Jakarta area, based the Land Use Planning (RTRW) has been directed to be a settlement area with a high density that is intended low- and middle-income people. As a preliminary step required restructuring area based on the a feasibility and the rules land use planning. There should also be active participation in a society such as participation, aspirations for the community welfare so the settlement area be livable back. The role of the community becomes indispensable to creates a sense of belonging to the neighborhood settlements to ensure the sustainability of settlement area clean and healthy.

The term resource recovery is used to describe the extraction of usable materials or energy from waste. The recovery process may involve conversion of the waste to energy, chemical transformation into a new substance, re-use in the same application after processing , or recycling into another product. Most anything can be recycled, recovered, or reused. The question is whether it is economic to do so for a particular waste stream at a given time and place. As natural supplies of materials and inexpensive energy are depleted. The quantity, composition, and source of the waste will dictate which recovery options are economically feasible. There are many chemical and physical processes that can be used to recover various types of materials from certain waste streams. Valuable inorganic materials can be recovered by separating a large-volume organic component from a small-volume inorganic component. Two factors have contributed in the last two decade, to growing interest in the recovery of resource from material that previously would been discarded the diminishing supply of inexpensive raw materials, and growing environmental concerns as reflected by regulatory policies.

a. Environmental concerns and regulation resulting from them are an influences on resource recovery system which conflicting affect on family economics.

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b. Composting is becoming alternative to clean condition for many waste type. As the cost green and clean environment increase people looking at resource recovery in case where it may not be economically profitable by it self but can serve to offset cost associated which their waste

With green and clean action was expected to resolve the problems of garbage and build a culture of clean and green in every neighborhood in Kelurahan Pinangsia based to community.

2. Problem research

How to planning the implementation Green and Clean concept in Kelurahan Pinangsia , considering this *kelurahan* inside to the conservation area Kota Tua DKI Jakarta. Moreover in this research will also be known how the pattern will be done by the community, especially in terms of sustainability in order to Green and Clean program can be run continuously uninterruptedly.

3. Methods

In this research are used field research methods. While the type of research is qualitative research which sought to give an overview of object observed

4. Literature Review

In social life quality of the environment can be associated with the quality of life. The higher the quality of life then it will be better the quality of their environment. Refer to Sugandy & Hakim 2007:

> *There are four indicators that can be used as a benchmark for sustainable development that can simply be used both for the central government and the region to assess the success of a Head of Government in the implementation of the sustainable development process.*

4.1 Green and Clean

Green and clean is a program that aims to create conditions for a clean, green and health environment to inhabited by society which is achieved through several activities that concern to waste treatment and greening. Processing of household waste consist of sorting, utilization of organic and anorganic waste Green and clean is an effort to create a living environment clean and beautiful with a base solid waste management. Sustainable solid waste management of household is a challenging task. To minimize solid waste and is needed community participation increase the recycling rate. The success of any recycling program depends highly on people participation actively and sorting activities.

4.2 Human Improvement

Demand for space for residential construction, public facilities and infrastructure etc, increase by average 600 ha / year (RUTR 2005 DKI Jakarta). According to the increase of demand for land, the value of land economically increases too.

In terms of procurement of housing DKI Jakarta almost 75% are self-help housing of their efforts and generally as innovation either individually or in groups. Furthermore, the supply pattern of land for housing treated as a commodity to be traded in which causes increasing in house price is a consequence of middle-income society to owned house more difficult. Formal requirements, the provision of technical and administrative felt not affordable with medium economy class societies, thus encouraging the private sector to housing development to be uncontrolled and unsupervised well. The increase in self-help housing is indispensable concern to government through various improvement programs which include facilitation of assistance to the community to build and improve the quality of their neighborhoods.

4.3 Policies to Improvement Quality in Urban Settlement by Government

With the condition of most settlements with poor conditions and the housing needs in the future, so the policy of increasing the quality of the settlement are as follows:

a. Society together with the government working together to repair or restore existing homes gradually by subsidies of between community groups.
b. Environment with crowded population and poor environmental condition need to be rearranged to urban renewal
c. For housing existing in kampong with bad condition, needs to be restored through kampung improvement program involved public funding sources.
d. The government require to increase its role in the form of provision of land, infrastructure and public facilities as well as construction of new housing in direct or indirect involvement.
e. Improvements objective will be implemented addressed to a residential area of the kampong improvement but still prone to flooding.Headings

4.4 . Sustainability

The concept of Sustainable words that have been formulated by Gro Harlem Brundlant in 1986. Brundtland defines sustainability as:

"meeting needs of the present generations without compromising the ability of future generations to their own needs" (Kiel 2007)

Based on these definitions can be concluded that the concept of the needs not only basic human needs are food, clothes and houses, but the needs to live comfortably without diminishing the needs future generations and can be responsible for what you have done for humanity in an environment certain parts of the environment. Mankind must take responsibility for his pace to not harm the community in the future.

4.5 *Community Participation*

In improving community responsibility about the environment required in which related communities to develop a sense of responsibility about the environment with the expectation green and clean sustainability can be maintained and remain sustainable. There are several levels of achievement of participation [1] where each level can provide different roles for each community and stakeholders. The level of community participation was described as the ladder upstairs where more community tenure about the environment will be even greater.

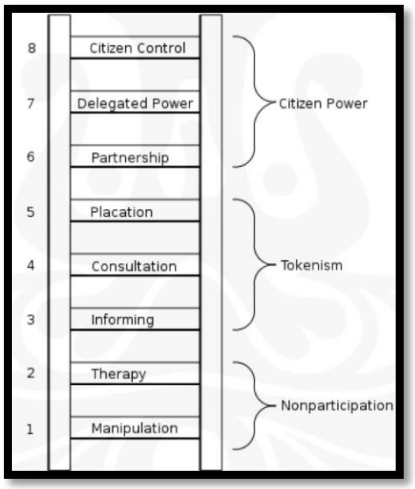

Fig.1. Ladder of Citizen Participation

5. Results

5.1 Green and Clean in DKI Jakarta

Gerakan Lingkungan Hijau (Green Environment Movement) – Ciliwung Merdeka, Bukit Duri – Kampung Pulo. In 2007 Ciliwung Merdeka realizing the environmental programs and community-based economic empowerment. The purpose of this program is to raise public awareness of Bukit Duri - Kampung Pulo through economic empowerment, self-help and community solidarity. As originally Ciliwung Merdeka initiated the formation of community groups formed by the name Gerakan Lingkungan Hidup Gerakan Lingkungan Hidup programs is:

a. Waste management program (organizing and building a home composting)
b. Clean water and build toilets
c. Nutritional increase programs
d. Health self-help programs
e. Healhty environment educational programs

For waste management program in the area of Bukit Duri - Kampung Pulo focused to the improvement of the quality of life so that people who do not have jobs (unemployment) or family income was little preferred for training so that the expected garbage processing segments of society as it was to earn extra income. The scope of waste management are taught ranging from how waste sorting between organic and non-organic to organic waste can be processed into compost which can be used alone or sold as extra income. With a waste management program all citizens care about the cleanliness of the Ciliwung and no longer citizens who throw garbage in the river. With a waste management program all citizens concerned with the cleanliness of the Ciliwung and no longer citizens who throw garbage in the river. In addition residents also increasingly eager to collect garbage, the more the more garbage garbage are processed.

5.2 Building Typology in Pinangsia

The implementation of concept of green and clean on Pinangsia applied in Jalan Lada Dalam which is located on Kelurahan Pinangsia. Building conditions in this neighborhood tend to be regular with fairly good physical condition with the majority of the allotment of land for settlements. Then for type of building in this area most of the permanent building

Fig.2. Building and Street Condition in Jalan Lada Dalam

5.3 Paradigm Pinangsia's Resident in Waste Managements

Green and Clean policies is expected to improve the environmental quality of the community in Pinangsia. Application of Green and Clean in Pinangsia very much on the resource component in the form of public knowledge, support facilities, as well as the level of sustainability of waste management. Paradigm household waste management in Pinangsia still use the traditional way, garbage was collecting into the bin or plastic bags which placed in front of their house. Each household will pay to cleanliness officer to take out the garbage periodically. That garbage that has been taken by the cleanliness officer will be taken to a disposal site which will then be disposed of to the final disposal. For that, the old paradigm of waste management it is time left behind, replaced by a new paradigm based on the understanding that waste management is a systematic, comprehensive, and sustainable waste reduction and handling. The new paradigm also consider waste as a resource economical value and can be used, for example: to compost, energy, or industrial raw materials.

5.4 Knowledge About Waste Management

Knowledge of waste management is needed in green and clean program, because the knowledge about waste management can change people's behavior in dealing with different types of waste. By following the chart below are known if the head of household as respondents around Jalan Lada Dalam as many as 75% of respondents only know the general differences in color bins, while the functions in detail they are less understand it. As for the various types of waste can be recycled or not, society in Jalan Lada Dalam only knew in generally that is organic or non-organic 96%, while for step sorting of waste, the family head Jalan Lada Dalam already know 80%. Their waste sorting was limited if provide economic benefits in brief such as old newspapers, old magazines, which can be sold by a kilogram to the waste collectors. While for the other waste such as plastic, bottles, and household garbage disposal was still mixed place.

5.5 The concept of Green and Clean in Pinangsia as The Basis for Improving the Quality of Human Settlement

Environmental management activities can be done if the cover of the built environment and social environment. In the Jalan Lada Dalam area have environmental as well as settlements in the city generally. The concept of waste management in this area is the training of waste involving community participation. With the training about waste management, the society is able to determine the waste that can be processed further. So that after training, the community can be a cadres environment to initiate waste banks. For non-organic waste that has been collected can be used as an alternative material to renovate houses. Material feedstock must pass through several stages of processing which is quite difficult (complicated) as non-organic material going through the design process further.

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Implications Of Craft Industry Cluster Pearl, Gold, Silver (PGS) Towards Settlements Region In Karang Pule Village, Sekarbela District Of Mataram City

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Abstract

The existence of industry clusters in Mataram City gave effect to the surrounding residential areas [9]. In accordance Spatial Plan of Mataram City in 2011-2031 PGS industry cluster in the village of Karang Pule, Sekarbela district established as shopping tourism area. Distribution of industrial locations were in four of seven environments in Karang Pule. Distribution of PGS industry is divided into three (3) groups: craftsmen, craftsmen who is also a seller, and the seller (merchant). The location of the craftsmen, craftsmen who are also businessmen and entrepreneurs are also used as a dwelling house or workshop and store. So most of the people living in settlements around clusters of industry that there is a link between industry cluster and settlements. This study aims to determine the implications or the impact of the presence of PGS industry clusters the surrounding residential areas. The method used in this research is descriptive qualitative with the collection of primary data through direct observation and questionnaires. Based on direct observation on the shopping tourism area there are inequality between the conditions of industry clusters and settlements area by the presence of slums. The results showed that the PGS industry cluster impact on social, economic and environment near settlements area. Impacts that occur are: 1) the social aspect, there is a significant change in the level of education, social welfare and social disparities but less significant to the formation of institutions, particularly in community participation , 2) the economic aspect of the change status of community work, and increased revenue and 3) the environmental aspects of the change to the condition of the building, the quality of public housing, the presence of slums, changes in infrastructure and the environmental pollution.

Keywords: Implications; Industry Cluster; Settlements; Inequality

1. Introduction

Mataram city is a city that has a lot of potentions, one of those is the potential industry. The existence of this industry has a very important role in economic development and growth of a region because it can increase revenue and provide jobs for the local community. The existence of the industry itself can provide a wide range of effects both positive and negative impacts. Karang Pule Village, Sekarbela district of Mataram City established as a small industry cluster featured to craft Pearl, Gold And Silver (PGS). Regional Regulation Number 12 of 2011 on Spatial Planning of Mataram City in 2011-2031, Sekarbela district included in the development of settlements area while Karang Pule village established as shopping and tourism area of small business development. Beside those potentions, the presence of issues such as environmental, economic and social. Settlements region can be used as industry activities lead to the presence of slums. The slums can cause the inequality between environmental, economic and social aspects that exist in the PGS industry cluster of Karang Pule village. This research was conducted in order to determine the implications of PGS industrial clusters on the settlements region.

According to Law Number 1 of 2011 [2] on Housing and Settlement region, referred to the settlements which consisted of more than a unit of housing that has the infrastructure, facilities, public utilities, as well as having to support activities other functions in urban or rural areas. According to the Law of Industry Number 3 of 2014, the industry is all forms of economic activity that processes raw materials and or take advantage of industry resources to produce goods that have additional value or higher benefits, including industry services. From the geographical perspective, the industry as a system, sub-system is a mix of physical and human sub-system [8]. Ministry of Industry of Indonesia's national industry grouping into 3 major groups: 1) Basic Industry, 2) Miscellaneous Industry, and 3) Small Industries. According Soepono (1999) [7],

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agglomeration by modern location theory is one of the factors that influence economic activities, agglomeration also be one of the factors in addition to compare advantage and economies of scale that explains why the industry raised areas and cities. Some things that can cause agglomeration [1] are: 1) labor provided many of which have the ability and expertise better than the outside area, 2) a company becomes an attraction for other companies, 3) development of a companies from small to large, causing other companies to support the enlarged company, and 4) transfer of production activity from one place to some other place. Other companies approach the source material for the production activity generated by existing companies to support each other. So agglomeration is the concentration of economic activity spatially arise because of the savings gained due to nearby locations.

The effect by each industrial area varies according to the characteristics and potential sector at different certain sectors. Thus, if an industry or industry area built in a location and then the industry is growing then it would be predicted that other economic units tend to pick a location connected directly which is ultimately going to give mutual benefits. The existence of PGS industry clusters in the village of Karang Pule have an impact on social, economic and environmental. Social impact, with the presence of PGS industry clusters raises the number of people that affect the building density and increased economic activity. It is also impact on the environment, such as pollution, and the formation of slums around the industry area due to industry conditions that are in settlememts [9].

2. Methods

The location of this research is located in the village of Karang Pule, Sekarbela district of Mataram. The approach used in this study is derived from the rationalistic approach theory and empirical truth. Kind research used a qualitative descriptive that systematically describe the situation, the situation, the specific program [6]. Data collection methods used were primary data collection in the form of direct observation and questionnaires.

3. Results

3.1. Region Overview

Karang Pule village has an area of 106.7 square kilometres. Karang Pule village have 544 households with a population of 10423 people divided into seven environments. Karang Pule village is divided into seven environments, they are : 1) Karang Pule, 2) Pande Besi, 3) West Pande Mas , 4) East Pande Mas, 5) Karang Seme, 6) Mas Mutiara and 7) Kekalik BTN.

3.2. Distribution

PGS for the distribution industry Karang Pule Village is divided into three groups: craftsmen, craftsmen who is also the seller, the seller (merchant). There are four environments is a core area of industry PGS Karang Pule village is in the Environment of Pande Besi, Pande Mas West, East Pande Mas, and Mas Mutiara. For the spread of the location of PGS the industry cluster in the village of Karang Pule, can be seen in the table 1.

Table 1. Number of Handicraft Industry Location PGS divided Per Type and Environment

No	Environment	Craftsmen	Craftsmen and Sellers	Seller
1	Pande Besi	1	3	4
2	West Pande Mas	13	0	9
3	East Pande Mas	62	1	14
4	Mas Mutiara	0	4	7
Jumlah		76	8	34

For the distribution of craftsmen more dominant location in the Village of East Pande Mas. The location of the craftsmen is housing that is also used as a workshop while the spread of craftsmen who is also the seller is housing that is also used as a workshop or shop. Location spread of sellers is largely a shop and a small portion of which is used as homes and shops. For the spread of sellers (traders) were in four environments, which are scattered along major roads namely Sultan Kaharudin street which is indeed the most strategic location to sell products.

3.3. Relationship Between Industrial Zone PGS with Settlement Region

Cluster according to Porter (1998) [5] is the geographic concentration of companies and institutions that are interconnected in a particular area. In this case of the PGS industry cluster is not only related to the industry sector alone but also to the surrounding residential areas associated with the location of industry craftsmen PGS who also serve as homes and workshops and stores. It shows that the agglomeration occurs between industry clusters with surrounding residential

areas. Thus indirectly, the industry activity in the region of course affect the surrounding residential areas, both in terms of social, economic, and environmental.

Judging from the distribution of industry location map can be seen that the location PGS craft industry are located in settlements areas. This can be seen in the following figure.Equations are to be numbered consecutively throughout the paper. The equation number, in parentheses, should be placed flush with the right-hand margin of the column. When possible, use an equation editor. Equations and formulae should be typed and numbered consecutively with Arabic numerals in parentheses on the right hand side of the page (if referred to explicitly in the text),

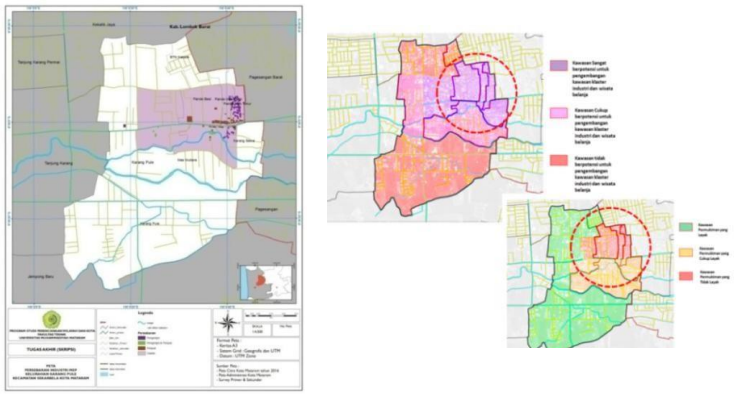

Fig. 1. (a)Distribution Map (b) Linkage cluster

From mapping the distribution of the industry, it is obtained a regional division based on its potential in the development of PGS industry cluster area, here is a map of the distribution of potential area for the PGS industry cluster. Based on the distribution map of potential area PGS industry can be seen that the most potensial area in the development of industry cluster is settlements that is unfeasible. This suggests that industry activity PGS's in the Village Karang Pule affect the surrounding residential areas. The slum area located at Pande Besi, West Pande Mas and East Pande Mas environment with an area of 13.50 ha, or approximately 10.23% from the total area of Karang Pule village. As for the quite feasible settlement contained in Mas Mutiara environment with an area of 18.65 ha, or approximately 14.12% and had a feasible settlement are outside the region, namely in Kekalik BTN and Karang Pule environment of 95.20 Ha or about 72.10%. For Karang Seme environment which are outside the PGS industry cluster included in the category of settlements region is quite feasible with an area of 4.69 ha, or approximately 3.55%. For more details can be seen in the following table 2.

Table 2. Feasibility of Settlement Region On PGS Industry Cluster and PGS Non Industrial Cluster

No	Environment	Land Area (Ha)	Persentase (%)	Eligibility Settlement Region	Cluster type
1	Karang Pule	92,40	69,98	Feasible	Non Cluster
2	Kekalik BTN	2,80	2,12	Feasible	Non Cluster
3	Mas Mutiara	18,65	14,12	Quite Feasible	Pgs Cluster
4	Karang Seme	4,69	3,55	Quite Feasible	Non Cluster
5	Pande Mas Timur	2,80	2,12	Unfeasible	PGS Cluster
6	Pande Mas Barat	2,87	2,18	Unfeasible	PGS Cluster
7	Pande Besi	7,83	5,93	Unfeasible	PGS Cluster
Total		132,04	100,00		

3.4. Implications of PGS Industrial Cluster

The implication is a change caused by an activity, a business investment in development activities have the potential ability to create an impact. So the implications are the PGS industry cluster effect of the emergence of human activity in the construction on the environment, including human PGS industry group.

3.5. Social implications

The impact of the presence of PGS industry clusters towards the surrounding settlements in the social aspects include: level of education, public welfare, institutional and social inequality. The social implications of the presence of PGS industry clusters can be seen in Figure 3 below

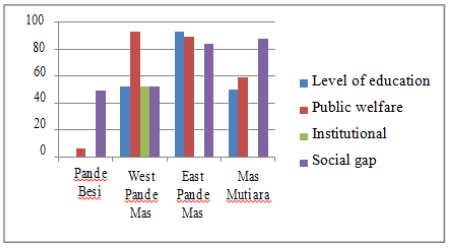

Fig. 3. Social Aspect Diagram

The social implications of the presence of PGS industry clusters in the Village Karang Pule is:

1. There were changes in levels of public education in four environments and the highest in Mutiara Mas environment by 90%.
2. There were changes in the welfare of society in four environments and the highest in the neighborhood West Pande Mas by 90%.
3. The establishment of the institutional environment West Pande Mas at 50%, is still not evenly distributed in the other surroundings.
4. There was social inequality in four environments, and the biggest is in Mutiara Mas environment up to 90%.

So the social implications of PGS industry clusters to settlements region is the presence of a significant change in the level of education, social welfare and social disparities, but less significant to the formation of institutions, particularly in community participation and or community.

3.6. Economic implications

The existence of PGS industry clusters for the economic aspects include: employment status and income growth. The economic implications of PGS industry clusters can be seen in Figure 4 below:

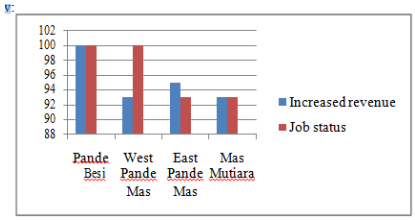

Fig. 3. Economic Aspect Diagram

1. There were changes in the people's income fromfour environments and the highest in Environmental West Pande Mas and Pande Besi amounted to 100%.
2. There were a change in the status of community work fromfour environments and the highest in Environmental Pande Besi and East Pande Mas of 100%.

So the economical implications of the PGS industry cluster settlement area is a change in the status of community work, and significant increases in revenue in four the environment, especially in the Environment Pande Besi and West Pande Mas.

3.7. Environmental implications

The existence of the industry on the one hand the changes that have an impact on the socio-economic, but on the other hand also brought changes that have a negative impact, the negative impacts include pollution of the environment surrounding the industry. Environmental aspects with the PGS industry cluster include: the condition of the building, the quality of buildings, slums, infrastructure and environmental pollution. Environmental implications of the presence of industry clusters PGS can be seen in Figure 5 below:

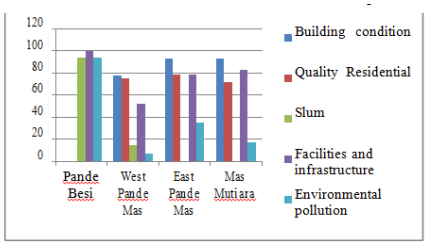

Fig. 3. Environmental Aspect Diagram

1. The existence of the PGS industry affect the condition of the building in four environments and the highest is in the East Pande Mas environment about 85%.
2. The existence of the PGS industry affect the quality of residential communities in four environment and the highest is in the East Pande Mas environment amounted about 75%.
3. PGS industry gave rise to slums in four environments and the highest is in the Pande Besi environment amounted about 80%.
4. The presence of PGS industry cause changes in the number of facilities and infrastructure in four environments and the highest is in the Pande Besi environment amounted about 85% .
5. PGS industries cause environmental pollution that occurred in four environments, and the highest is in the Pande Besi environment about 90%.

Thus, the environmental implications of PGS industry clusters towards settlements region to the environmental aspect is the change of the condition of the building, the quality of public housing, the presence of slums, infrastructures changes and the environmental pollution

4. Conclusion

From the research that has been done can be concluded as follows:

1. The existence of the PGS industry cluster linkages to settlements regions as the presence of slums thus indirectly impact or implications for the joints of people's lives both in terms of social, economic and environmental.
2. There were settlements region is unfeasible or slums on three environment located in the PGS industry clusters, namely Pande Besi, East Pande Mas and West Pande Mas while quite feasible settlements region located at Mas Mutiara environment. For Karang Seme environment which are outside the PGS industry cluster included in the category of settlements region is quite feasible too. Also had a feasible settlement are outside the PGS industrial cluster, namely in Kekalik BTN and Karang Pule environment.
3. The presence of PGS industry clusters implications on the feasibility of settlements region in the presence with the slums while settlements are outside the PGS industry cluster included in the category of feasible and quite feasible.
4. The social implications of PGS industry clusters to settlements region is the presence of significant changes in the level of education, social welfare and social disparities, but less significant to the formation of institutions, particularly in community participation.
5. The economic implications of PGS industry clusters towards the settlements region of the economic aspect is the change in employment status of the community and significant increases in revenue from four the environment, especially in the Pande Besi and West Pande Mas.
6. The environmental implications of PGS industry clusters on the settlements region are the changes of the building conditions, the quality of public housing, the presence of slums, infrastructure changes and the environmental pollution.

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Determination of Alternative Incentives And Disincentives in The Utilization of Space at Priority Areas – Case Study: Village Tunggulwulung & Tasikmadu Malang

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Abstract

Subdistrict of Tunggulwulung and Tasikmadu is an area with high growth rates that need to be driven to its growth in equitable development. Efforts to encourage growth in a particular area cannot be carried out by the City Government's own Unfortunate given the existence of budget constraints, therefore the need for collaboration (partnership) with private parties as well as the surrounding communities. This research aims to determine alternative incentives and disincentives that are most needed in the area of priority in order to speed up or encourage the growth of the region in Subdistrict Tunggulwulung and Tasikmadu. Some form of control the use of space is the granting of incentives and disincentives is a form control that maintains an active role in society. Observationally, the existing land use and spatial product reviews reviewed according to variable criteria (location) incentives and disincentives by using descriptive qualitative methods as well as a study on the policy of incentives and disincentives of using content analysis, especially regarding the application of the procedures and the enforcement of the policy of taxation, levies, licensing, provision of infrastructure, subsidies, compensation, and others who are on site research, then the utilization of space in the village Tunggulwulung and Tasikmadu that can earn incentive, namely the residential , trading and services, education, and health with alternative forms of incentives for the utilization of space that can be applied is tax relief, reduction of the levy, the provision of infrastructure, the ease of licensing, lease space and levy shares, while for disincentive in Subsdistrict of Tunggulwulung and Tasikmadu directed at the region boundary SUTT with all forms of disincentives can be applied.

Keywords: Utilization Of Space; Incentives and Disincentives; Areas Of Priority

1. Introduction

Malang as one city in East Java province developing have a problem space that can interfere with the intensity of its growth. With a vision that is "accomplishing the Malang as quality education, Cultured, Prosperous Society towards Environmentally" then the direction of growth in the education sector will greatly influence the development of Malang. The existence of a very Unfortunate development rapidly it certainly will bring consequences will request an increase in the land for a variety of business activities as well as for the settlement. The development of the neighborhood generally use land that has not been awakened, both in the form of rice fields, moor or other dry ground. In other regions in the area woke up precisely the development of symptoms appear different, i.e. at about the location of the strategic land use changes from a less productive into more productive activities, for example from housing into the shops, from the building of the super block (plaza, supermarket, department store) and so on. It has also been the cause of the occurrence of the development of the finite on main lines, so that the direction of the growth of the city became less evenly distributed because it focused on strategic areas only.

So much as happens on the Hapless North area that is directed as a supporter of the education area in the city of Malang, less smooth the growth of the city resulted in the need to encouraged the growth in some areas of the city/region. In the Raperda Malang in 2011 about Spatial Detail Plan of the city center, the hapless North Sub in 2012-2032 mentioned that high-growth area that needs to be encouraged its growth include the Villages Tunggulwulung and Tasikmadu, where the high growth area of handling plans referred to do with seeking the construction of a facility is

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estimated to be around of which stimulates the growth of the housing development being built by the developer. As the areas prioritized for encouraged its growth in equitable development effort sure Village Tasikmadu Village and Tunggulwulung need to get special attention.

Subdistricts of Tunggulwulung and Tasikmadu Villages were two wards are it is located north of the city's most Unfortunate and bordering Subdistrict Singosari Malang that still has plenty of land was not awakened. In addition there are also some educational facilities which have a scale of national-regional-local Campuses including ITN Malang 2. The development of the area of the education scale national/regional (College, high school, SMK) surely give effect (multiplier effect) to the development of urban spatial as well as economically in the future. As a priority that needs to be encouraged and growth have some towing facilities of course there needs to be an effort control the utilization of the space so that the growth of this region can be in line with the spatial plan has been determined.

Efforts to encourage growth in a particular area of course cannot be conducted by the City Government's own Unfortunate given the existence of budget constraints, therefore there needs to be cooperation (partnership) with private parties as well as the community around. One way to encourage growth in the region to speed up/ fixed in line with the priorities and plans of the existing space by private parties and society is to provide incentives and disincentives utilization of space. In law No. 26 of 2007 mentioned that the form control of utilization space is done through zoning regulations the assignment, licensing, granting incentives and disincentives utilizing spaces as well as sanctions. Of some form of control of the use of space is the granting of incentives and disincentives is a form control that maintains an active role in society.

Under article 38 is explained in the implementation of the use of space to let use of space in accordance with the plan of spatial locality can be given incentives and disincentives by the Government and local authorities. The incentive is a device or an effort to give the reward against the implementation of the activities in line with the spatial plans while the disincentive is the device for preventing, limiting or reducing growth, activities not in line with the spatial plan. Incentives can be given to the utilization of space activities in the region are driven development, while rendered disincentive for the use of space activities in the area of restricted development. The incentives referred to above in the form of tax relief and retribution, the granting of compensation, cross-subsidies, in return, rental space, as well as construction stocks, levy procurement infrastructure, ease of licensing procedures, as well as the granting of awards. Incentive and disincentive given by remaining respectful of the rights of the community. Whereas a disincentive is the reverse could be the imposition of taxes/levies raised area, restrictions on the provision of infrastructure, the imposition of a special condition in compensation, licensing, etc. Incentives and disincentives may be given by the Government to local governments, local Government to local government and other Governments to the public. Further provisions concerning the form and procedures for the granting of incentives and disincentives are governed by regulation of the Government.

In accordance with the provisions of the above then the local Government of Malang is made possible to provide incentives or disincentives to the use of space private parties in order to encourage growth in Poor regions of the North, especially in Villages Tunggulwulung and Tasikmadu. The granting of incentives and disincentives utilization spaces adapted to the characteristics and needs of the development of the Poor regions of the North. The granting of incentives and disincentives concerning elements that related locations or the form of incentive and disincentive policies use of space which could be applied

2. Methods

2.1. Identification of a Location can earn Incentives & Disincentives Utilization of Space

The identification of a location can earn incentives & disincentives this space utilization it is the stage of the analysis is done through observation techniques on location Research and the results of the review of existing spatial products. This analysis aims to determine the location of the priorities the granting of incentives and disincentives utilization space or the use of the land that became the target of granting or imposition of incentive and disincentive the utilization of space in the center of the North, especially in Poor Villages Tunggulwulung and Tasikmadu. In this case not all the Villages Tunggulwulung and Tasikmadu can be given the incentives or disince ntives even though it has been mentioned in the Raperda City Hapless in 2011 about the plan of Spatial Detail Poor Central North Sub of the year 2012-2032 [2] high growth area that needs to be encouraged its growth the second area includes the neighborhood. Observation of the results of existing land use and spatial product review there will be reviewed according to the variable – variable criteria (location) incentives and disincentives to determine the location where space utilization which can earn incentive and disincentive the space utilization. The type of method used is descriptive qualitative.

2.2. Identification of a Location can Earn Incentives & Disincentives Utilization of Spaces that can be Applied

The identification of an alternative form of incentive and disincentive utilization of space that can be applied analysis of phases is done after a review on the policy of incentives and disincentives, particularly regarding the procedure of the implementation and enforcement of policies of taxation, levies, licensing, provision of infrastructure, subsidies, compensation, and other on site Research . This analysis is conducted by comparing the results of observation in this space utilization in the field with the study of theory, standards and procedures of the application of existing policy. This analysis is conducted by comparing the results of observation in this space utilization in the field with the study of theory, standards and procedures of the application of existing policy. The technique of analysis used in this analysis is the analysis of content or content analysis.

3. Results

3.1. Determination of a Location can Earn Incentives & Disincentives Utilization of Space

In this case not all the subdistricts of Tunggulwulung and Tasikmadu can be given incentives or disincentives even though it has been mentioned in the Raperda Malang in 2011 about the plan of Spatial Detail Poor Central North Sub in 2012-2032 that area of high growth that needs to be encouraged its growth include the two areas the wards.

From the results of the analysis, known to the utilization of space in the village Tunggulwulung and Tasikmadu that can earn incentive, namely the residential, trade and services, education, and health. The utilization of this space gets incentive because of planned growth as driven and wanting to support facilities are new, but the utilization of this space must comply with the provisions of the location where it has been planned. This means that the utilization of these spaces can earn incentive when built in what the has been planned in accordance with the map plan of pattern space that exists in the product layout space. For example, developers want to build a residential Neighborhood area of Tunggulwulung or Tasikmadu, he will earn an incentive in a location like to used is indeed the intended function of the housing. When it was built in the area with other provisions, such as per merchandise suita, education or agriculture will still be allowed as long as it doesn't violate existing regulations but will not earn incentives that have been promised.

As for the disincentive in the village Tunggulwulung and Tasikmadu directed in the area of the borders of the protected area because is SUTT so that growth in the utilization of other spaces like to be restricted, although there is room pattern plan map locations around the region borders SUTT permitted its utility.

3.2. Determination of Alternative Forms of Incentives & Disincentives Utilization of Space

Referring to law No. 26 of 2007 [3] about Spatial and Government Regulation No. 15 of 2010 About organizing the Structuring of space, there are two classifications of incentive and disincentive i.e. fiscal and non fiscal. On the research of the classification is used both as the basis for the Division of the form of incentive and disincentive utilization of space. Fiscal incentives consist of tax relief and a reduction of the levy, while the non fiscal incentives consist of the provision of infrastructure, the ease of licensing, compensation, rewards, rental space, and urun shares. To disincentive fiscal consists of high taxation and levies, while additions to disincentive non fiscal obligations consist of the member's compensation, special requirements in licensing, duty reward, and restrictions on the provision of infrastructure. As for the variables used in this analysis is the variable alternative (Forms) of incentive and disincentive utilization of space.

Of each form of incentive or disincentive, there is space utilization the eight main components into a form of incentive and disincentive utilization spaces i.e. taxes, levies, infrastructure (infrastructure), licensing, compensation, reward, rent the space, and the stock levy each analyzed using content analysis . Alternative forms of incentives for the utilization of space that can be applied is tax relief, reduction of the levy, the provision of infrastructure, the ease of licensing, lease space and levy shares. Compensation could not be applied as a form of incentive because compensation is a form of compensation or reward in Exchange for the service provided to the affected party's loss due to use of space by one party, is certainly contrary to the purpose of the incentive thus wanted to give rewards to those who make use of the space in line with the spatial rules. As for the rewards could not be applied because of the concept of cooperation is expected to want to harness private party space with its own funds. As for the disincentive, all forms can be applied.

4. Conclusion

The utilization of space in the village Tunggulwulung and Tasikmadu that can earn incentive, namely the residential, trade and services, education, and health. The utilization of this space gets incentive because of planned growth as driven and wanting to support facilities are new, but the utilization of this space must comply with the provisions of the location where it has been planned. This means that the utilization of these spaces can earn incentive when built in what had been planned in accordance with the map plan of the pattern space that exists in the product space. For example, developers want to build a residential Neighborhood area of Tunggulwulung or Tasikmadu, he will earn an incentive in a location like to used is indeed the intended function of the housing. When it was built in the area with other provisions, such as , education or agriculture will still be allowed as long as it doesn't violate existing regulations but will not earn incentives that have been promised.

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Referring to law No. 26 of 2007 [3] about Spatial and Government Regulation No. 15 of 2010 About the Organization of Spatial, there are two classifications of incentive and disincentive i.e. fiscal and non fiscal. In this study using both the classification as the basis for the Division of the form of incentives and disincentives utilization of space. Fiscal incentives consist of tax relief and a reduction of the levy, while the non fiscal incentives consist of the provision of infrastructure, the ease of licensing, compensation, rewards, rental space, and levy shares. Fiscal disincentives to consist of high taxation and levies, while adding to the non fiscal disincentive consists of the obligation to give compensation, special requirements in licensing, duty reward, and restrictions on the provision of infrastructure.

Alternative forms of incentives for the utilization of space that can be applied is tax relief, reduction of the levy, the provision of infrastructure, the ease of licensing, lease space and levy shares. Compensation could not be applied as a form of incentive because compensation is a form of compensation or reward in Exchange for services provided to the affected party's loss due to use of space by one party, is certainly contrary to the purpose of the incenti ve thus wanted to give rewards to those who make use of the space in line with the spatial rules. As for the rewards could not be applied because of the concept of cooperation expected private parties to want to utilise the space with its own funds. As for the disincentives, all the shapes can be applied

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Urban Development Control Based On Transportation Carrying Capacity

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Abstract

Severe transportation problems in Indonesian urban areas are stimulated by one fundamental factor, namely lack of awareness on transportation carrying capacity in these areas development control. Urban land use development towards more physical coverage is typically not related with the capability of transportation system to accommodate additional trips volume. Lack of clear connection between development permit with its implication on the transportation side has led to a phenomenon of exceeding transport demand over supply capacity. This paper discusses the concept of urban land use development control which will be related with transport carrying capacity. The discussion would cover both supply and demand sides of transportation. From supply side, the analysis regarding the capacity of transport system would take both existing as well as potential road network capacity could be developed. From demand side, the analysis would be through the control of a maximum floor area and public transport provision. Allowed maximum floor area for development would be at the level of generating traffic at reasonable volume.. Ultimately, the objective of this paper is to introduce model to incorporate transport carrying capacity in Indonesian urban land use development control.

Keywords: Carrying Capacity; Landuse; Supply; Demand; Volume Capacity Ratio; Level of Service

1. Introduction

In Indonesia urban areas, land use development keep going on to fulfil the residents needs for housing as well as other facilities. However, in most cases, urban land use development does not seem to have a clear reference on transport carrying capacity. Despite long awareness of land use development impact on transport system: land use development causes new trip generation/attraction in urban road network that increases the traffic volume [1], we hardly found a systematic method to take it into land use development control account, especially for Indonesia case. It would be necessary then, to develop a model that systematically incorporate transport carrying capacity as one crucial element in urban land use development control.

In environmental study, carrying capacity is the ability of the environment to support humans and other living beings. Analogically, in transportation study, carrying capacity could be define as the ability of the whole transport system to accommodate trip volume at the level in which a reasonable level of service is maintained. Since we understand that land use development implies additional trip volume, then it should be stopped at the level in which its implication on transport system start to threat the reasonable level of service. (e.g. by using VCR/volume to capacity ratio criteria). Transport level of service is the reflection of volume to capacity ratio. Solving the problems of traffic that comes from an imbalance proportion between volume and capacity can be solved in three ways (Warpani, 2002) [2] :

a. Adding supply capacity by building new roads or widening existing roads. This method may not be carried out continuously since there is certainly limitations of the space for road widening as well as economic-social-cultural problems.
b. Reducing the volume of traffic by reducing the number of vehicles through land use management, public transport provision, etc.
c. Combining the first and the second method through traffic management.

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This paper uses those three ways to further discuss the analytical model of using the transport carrying capacity as the basis for urban land use development control that is able to provide guidance for land use development control to maintain reasonable transport level of service. In this study, land use development control is approached by supply and demand management. According to Massachusetts Highway Department [3] in Setiawan (2009) [4], traffic management is a process of setting on supply and demand in existing road system for specific purpose without adding new infrastructure, through the reduction and regulation of traffic movement. From that definition, it is clear that traffic management is done by optimizing the supply and controlling the demand (Putranto, 2000) [5],

Next section will discuss model development to incorporate all the above variables which basically incorporate transport carrying capacity to urban land use development control. This model may be further develop as a practical tools for urban land use planning permitintroduce the paper. The paragraphs continue from here and are only separated by headings, subheadings, images and formulae.

2. Method

Methods of data analysis in this section is the result of analysis from secondary data. The method developed in this paper is expected to be the initial form of model for future urban land use development control that accommodate transport carrying capacity. The sequential step of the model is based on transport supply and demand management as can be seen in Figure-1.

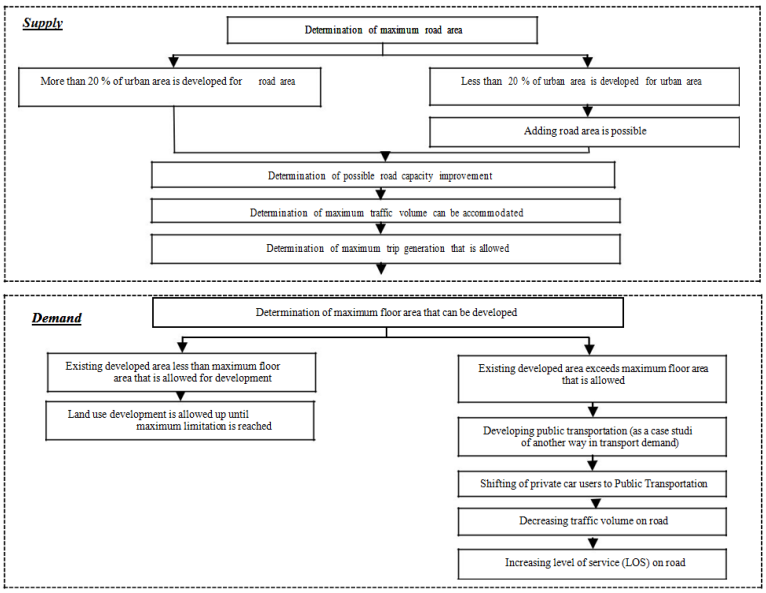

Fig. 1. Flow chart: analysis of transport carrying capacity for urban development control

2.1. Transport Supply

From supply side, the analysis is proceed by calculating maximum road space that still can be developed in urban area. Here are the stages of the analysis carried out from the supply side.

a. Maximum area for road development

Construction on the street in urban area in this study refers to Ministry of Public Work Regulation No. 05/PRT/M 2008 which guide the provision and utilization of green open space in Urban Area [6]. The proportion of the road network in urban areas based on this regulation is 20% of the urban area. Therefore, road space that can be developed can be calculated with the following formula:

$$Road\_Area_{mx} = 20\% \times Urban\_Area \qquad (1)$$

b. Maximum traffic volume

The maximum volume of traffic on this study is maximum traffic volume that can be allowed to pass road network based on volume capacity ratio (VCR) plan. VCR plan that is used in this study is 0.75 which is the limit of level of service (LOS) that is considered a good LOS for road in Urban Area.

Once the Volume Capacity Ratio (VCR) is known, the maximum traffic volume (Vmax) can be counted. Vmax can be described as maximum traffic volume that can be accommodated by the road at the planned VCR. Vmax can be counted by multiplying VCR plan with exixting road capacity (C). Maximum traffic volume (Vmax) is calculated as follow:

$$V_{\max} = VCR_{plan} \times C_{existing} \qquad (2)$$

where :

V_{max} = Maximum traffic volume allowed (pcu/hour)
VCR_{plan} = Volume Capacity Ratio Plan
$C_{existing}$ = Existing Road Capacity (pcu/hour)

Once V_{max} has been known, V_{max} in this study is considered as maximum trip generation maximum (TG_{max}) that is allowed. So, the trip generation that is produced by land use can not pass the maximum trip generation that is allowed.

2.2. Transport Demand

From transport demand management point of view, the approach that is by reducing private car users. These methods are expected to reduce total traffic volume to maintain a reasonable transport level of service. The method of calculation is developed as follows:

a. Maximum floor area development allowed

To calculate trip generation produced by one area, trip rates of each type of land use are required. The value of trip generation can be calculated by using trip rate standard for each land use type. The formulation to calculate trip generation is:

$$TG_{\max} = \sum Trip\_Rate_{GL} \times A_{GL} \qquad (3)$$

where:

TG max = Maksimum trip generation (pcu/hour)
Trip Rate GL = standard trip rate for land use type GL (pcu/ hour/m2)
AGL = Area Floor of land use type GL (m2)

The above formula can be used to calculate the maximum additional floor area development (of land use type GL) allowed, by using the formula:

$$A_{GL} = \frac{TG_{\max}}{\sum Trip\_Rate_{GL}} \qquad (4)$$

Therefore, A_{GL} can be referred as the parameter to control land use development in that area. Land use development permit should be subject to criteria that no further permit would be granted if the total area development has reached A m^2

b. Percentage of private vehicle users that can be converted to public transport

The objective of this section is to estimate the potential traffic volume reduction, by converting some of the mode use from private to public transport. There are numbers of method could be chosen to proceed the calculation, e.g. based on survey questionnaire modal choice. Results of the survey is the percentage availability of private vehicle users who will switch to public transport. In this section, the percentage of mode shift from private car to public transport is based on types of private vehicles used (this study assesses private car and private motorcycle).

c. Traffic volume reduction by private to public transport shift

Traffic volume reduction depend on the number private vehicle user shift to public transportation. After the percentage of private vehicle users can be converted to public transport have been known, we can calculate the reducing volume traffic. There are several steps:

Convert the volume traffic of private vehicle (Vp) into passenger (P) by multiplying to Load Factor (LF)

$$P = Vp \times LF \qquad (4)$$

Multiplying probability of public transport shift (%P) to passenger total of private vehicle to get the number of passenger who convert to public transport (SP)

$$SP = \%P \times P \quad (5)$$

Then the total passenger of public transport is divided by Load Factor (LF) of public transport to get the number of public transport (Npu) that is needed.

$$Npu = Sp / LF \quad (6)$$

Then multiplying the number of public transport (Npu) with standard of pcu (sn) to get the number volume public transport in pcu unit (Vpu)

$$Vpu = Npu \times sn \quad (7)$$

Then the Vpu into the remaining volume of private vehicle (Vp) that does not change into public transport to get the whole of traffic volume (V)

$$V = Vpu \times Vp \quad (8)$$

And the last, to get the newest VCR. Traffic volume (V) is divided by road capacity (C). Then convert VCR to LOS for knowing the change of level of service of roads.

3. Results

The objective of this paper is to introduce model to incorporate transport carrying capacity in Indonesian urban land use development control. The model will calculated maximum land use development based on transportation carrying capacity. Then this model can be a tool for government to give permit for developing land use.

4. Conclusion

Development of urban area control base on carrying capacity needs to be done by approach in transport supply management and transport demand management. In supply side, the supply is related to capacity of space. There is limitation in land to be developed as area of road network. So, the road development should be built to suit the needs. In demand side,

Whenever road development reaches its maximum level, there is a need to control development through demand side. In this study, transport demand management is needed to maintain the level of service (LOS) on road. Land use development control is performed by control maximum land use that is allowed in each of every road classifications. Land use area will affect how much trip generation that is produced. So, land use area should be controlled in maximum capacity road level. Another way of transport demand management approach that is used in this study is creating public transport to decrease traffic volume that crosses on road and increase LOS on road.

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The Approach Methods of Visual Absorption Capability For Conservation Ancient Buildings Area In Pasuruan City

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Abstract

Pasuruan city became one of the VOC terrority in 1706. Becoming the capital of the residency that has economical strategy value for VOC and the Dutch of East Indies. It causes by an increase of the dutchman and the Chinese community interest to come and stay in Pasuruan City. Therefore, many new buildings were established at that time which have the status as ancient building on this day. But today, many ancient buildings were destroyed, besides the local community do not feel the role of the government city to preserve the ancient building according with local regulations about heritage building in Pasuruan City. The purpose of this study is analyzing and determining the zoning recommendations in which it is appropriate for preserving area and grouping the preservation of ancient buildings types in Pasuruan using Visual Absorption Capability (VAC) analysis. The results show the factors that affect the preservation concept of ancient building are incredibility, the role of history, rarity, strengthen regional, cultural and physical factors. While the regional zone of ancient buildings which can be applied in Pasuruan City are; the core zone with 4 area, the buffer zone with 2 area, developing zones with 2 area and supporting zone with 4 area. For those types of conservation that can be applied are preservation (5 buildings), restoration (12 buildings), rehabilitation (2 buildings)/ reconstruction (3 buildings), revitalization (12 buildings)/ adaptation (2 buildings) and demolition (2 buildings).

Keywords: zonation; preservation buildings; region

1. Introduction

Pasuruan City is one of that has legacy of ancient buildings. There are many buildings that are still standing but there is also a building that has been destroyed. Some of the problems that hamper the preservation of ancient buildings area in Pasuruan, including: 1. Provincial regulation on Heritage Buildings made no mention of how many buildings are preserved and the name or identity of the building. It also does not mention the type of conservation that can be applied in Pasuruan; 2. Many ancient buildings were demolished and the establishment of a modern architectural style building in the region of the ancient buildings; 3. Some of the ancient buildings located in Pasuruan change the function that is incompatible with the original function; 4. The absence of cultural heritage zoning in Pasuruan making it difficult for the conservation of ancient buildings. Base on the problems, it is necessary for making research on the preservation of the region and ancient buildings in the Pasuruan City "Approach Methods Of Visual Absorption Capability For Conservation ancient Buildings Area In Pasuruan City" with the aim to provide recommendations zoning and grouping types of ancient building preservation in Pasuruan City.

2. Methods

In general, it can be explained that the research Visual Absorption Capability for Preservation of Ancient Buildings Region in Pasuruan using evaluative-development analysis to answer the problem formulation. The sampling method using the population number of ancient buildings department stated in *RTRW Kota Pasuruan Tahun 2011* that as many as 9 road corridor consisting of 38 ancient buildings. Determining election survey respondents are owners or managers of ancient buildings. It is based on the issue of the problems which explains that *Peraturan Daerah Kota Pasuruan Nomor 24 Tahun 2012* too general as *Undang – Undang Cagar Budaya Nomor 11 Tahun 2010*. Futhermore, the respondents considered to be more aware ancient building conditions than the non owners of old buildings. Based on

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the number of ancient buildings in the city of Pasuruan then conducted survey objective assessment that can be done by researchers using multiple variables ratings (Table 1) with the results used as the grouping type of preservation of ancient buildings. As for the assessment area could use some variables that can be seen on the assessment (Table 2). Determination of zoning and grouping of ancient buildings in Pasuruan done using Visual Absorption Capability (VAC). The determination of regional produce preservation zones and preservation of anci.ent buildings group determined in accordance with the distribution value of VAC. Total grade and internal (i) is calculated using the formula: (1). k = 1+3,3 log n; (2). Interval = Highest VAC rated – Lowest VAC rated / number of classes, with k = number of classes and n = the total number of research plots.

Table 1. Variable Rate Building

No	Variables	Sub Variables
1.	The scarcity factors (X3)	Age of the building
		Characteristic buildings
		The uniqueness of the building
2.	Incredibility factors (X4)	Privileged forms
		Symbolic Meaning
3.	Role of History factors (X5)	The history of architecture
		Value of struggle
		Meaning History of the building
4.	Strengthening regional factors (X6)	The function of the building
		Quality building
5.	Cultural Values factors (X7)	Cultural identity
		Shifting cultural identity
6.	Physical factors (X8)	Shifting function of buildings
		The ownership status of the building

Table 2. Variable of Zoning Region

No	Variables	Sub Variables
1.	Architectural style	The building style
		Character of the building
		Number of floors of the building
2.	Facade of the buildings	Suitability Advertisement
		Suitability laying tree
		Defence wall facade
3.	Land Use	Types of land use
		Functional relationship
		The linkage of land use
4.	Circulation and Parking	Suitability structure
		Landmark
		Landscape elements
		Environmental quality of district
5.	Open Space	Open Space Passive/Active
		The role of public / *private* domain
		Hard/soft Landscape
6.	Pedestrian Area	Suitability area
		Reduction of vehicle attachments
		Atraction creator
		Design area
7.	Signages	Reflection of neighborhood character
		Suitability distance and size
		Conformance to the building
8.	Activity Support	Compatible use activities
		Suitability conceptual aspects
		Coordination of activities
9.	Conservation	Single building
		The structure and style
		The accuracy of the function of buildings
		Age and the feasibility of building

3. Result and Discussion

3.1. Characteristic of Ancient Buildings in Pasuruan

The ancient building in Pasuruan City some located on one street. There is a building that is located clumped but there is also a building that is located not clustered. Some buildings are shifting function that has a highest percentage. The ancient building that run into shifting function or not shifting the ownership status function has different buildings, some of which are private ownership status, there is the status of the city government ownership and status of ownership of a foundation or association with the highest percentage is the status of the city government. The different ownership status of ancient buildings because they do not get the attention from the City Government in providing funding for conservation of the entire ancient building. The highest percentage of resources used in building preservation in Pasuruan are ancient buildings with the city government status. The age of ancient buildings have vulnerable diverse but generally have a building age >100 years, for the vulnerable age of the building is divided into three groups, namely the age of the building 50-80 years, the age of the building ⩽100 years and >100 years, so can be grouped buildings with over 100 years (> 100 years) of age most dominating

3.2. The Grouping Type Preservastion of Ancient Buildings

The final results of the assessment objectively on the variables described in Table 1 and then conducted to determine the number of classes using the formula already desribed in the methods section. Then determine the distance interval distribution of the class by finding the difference between the total value of the highest and lowest value for total and then divided by the number of classes, so that the obtained result of calculation are 6 interval. Then a large interval values are distributed to the rank classification of the cultural heritage area can be seen in (Table 3).

Classification of the potential elements are further classified or adapted to the physical preservation directives that can be done in Pasuruan. Classification adjusted on preservation groups which are divided into four groups. The classification consists of four levels of potential, the direction of preservation and the level of permissible changes made in the ancient buildings. can be seen in (Table 4) and (Figure 1). For buildings included in type of preservation are preservation, rehabilitation, revitalization, demolition, and the following examples of the building can be seen in (Figure 2 and Figure 3).

Table 3. The elaboration of the Cultural Heritage Area Rating

No	Interval	Information	Preservation Group
1.	Grade 6 – 11	Very Low Potential	D
2.	Grade 12 – 17	Low Potential	C
3.	Grade 18 – 23	Medium Potential	B
4.	Grade ≥ 24	High Potential	A

Table 4. The elaboration of the Cultural Heritage Area Rating

No	Classification Potential Building Elements	Physical Preservation Aim	Physical Changes Permitted Levels
1.	High Potential	Preservation	Very Low
2.	Medium Potential	Rehabilitation/Reconstruction	Low-Medium
3.	Low Potential	Revitalization/Adaptation	Medium-High
4.	Very Low Potential	Demolition	High

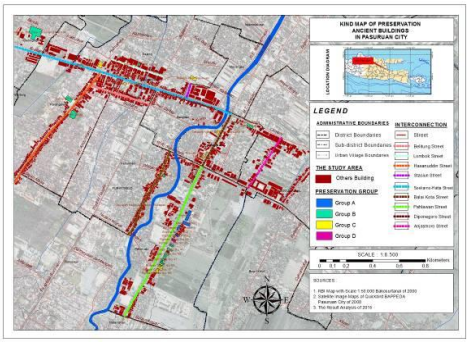

Fig. 1. The preservation of ancient buildings group

Fig. 2. (a) Building with conservation group A; (b) Group B; (c) Group C; (d) Group D

3.3. Formation of Ancient Buildings Zoning Area

Conducting in zone formation, conduct the building assessment objectively using variables in Table 1. Next determine the location of a point (grid) on the map with a distance of 300 meters, in order to obtain as much as 12 corresponding grid (Figure 4). Conduct an assessment using the VAC analysis using the same formula as the preservation of ancient buildings grouping discussed earlier. Then obtained the translation of the intervals class (Table 5). For the results of the Regional VAC of ancient buildings can be seen in (Figure 5). Next to the formation of zoning blocks of ancient buildings that can be seen in (Figure 6).

Table 5. The elaboration of the Cultural Heritage Area Rating

No.	Interval	Rate	Zone
1.	8 – 15	IV	Infrastructure Heritage Zone
2.	16 – 23	III	Utilization Heritage Zone
3.	24 – 31	II	Development Heritage Zone
4.	32	I	Main Zone

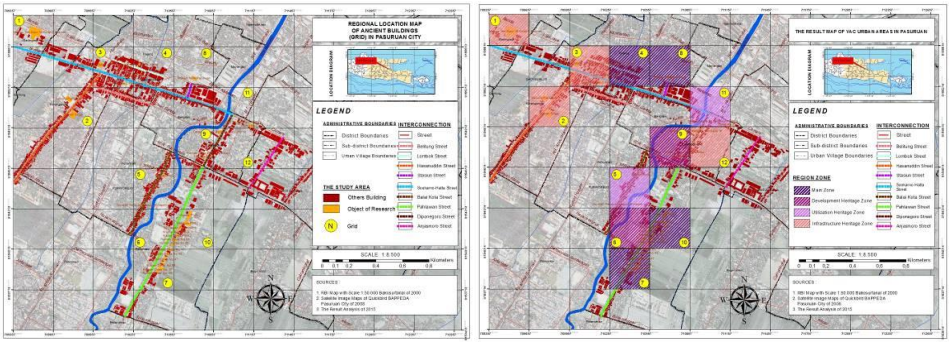

Fig. 3. (a) The determination of point location based on grid; (b) The result of the VAC ancient buildings zoning region

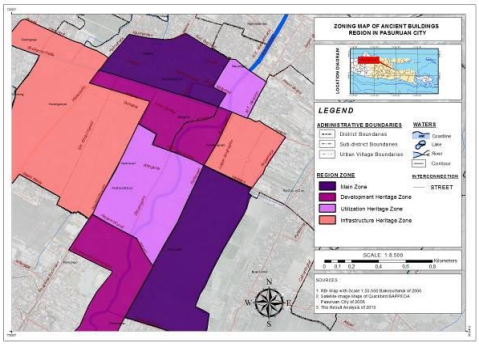

Fig. 4. Zoning area

Zoning area is divided into four zones. The main zone has named as a priority because the zone has a diversity of style and function of the building that became a bustling center of activity. A buffer zone has named by identity development zone since this zone has a role to strengthen the identity of the main zone. For the development zone has named by heritage utilization zone because according to the conditions of the study area that some ancient buildings used for religious activities and education. Supporting zone has named zones of infrastructure heritage according to the function that this zone has a role as a complement or support the fulfillment of the other zones. The main zone (top priority) is a major priority zones to be protected and not allowed to make new development because it is a zone to be protected. The development of Zone identity preservation can be done with the primary function to protect the core areas and improve the city's identity. Heritage utilization zones are only allowed to use to support the main zone and does not decrease the value of the area in the main zone and identity development zones, such as recreational activities, nature conservation area, the cultural life of traditional, religious and tourism. Zone infrastructure preservation of heritage to do with the designation of commercial and leisure activities of common but still consider the main functions in the area of the other zones in order to avoid activities that could damage the preserved buildings.

4. Conclusion

The type of building preservation that can be applied to the conservation of ancient buildings which is, the preservation has 5 buildings, the restoration has 12 buildings, the rehabilitation or reconstruction of buildings has 2 by 3 buildings, the revitalization has 12 buildings or adaptations has two buildings and demolition of the building has 2. Based on these results, then discovered that it is necessary to further research that discusses the image of the region of ancient buildings, stakeholder perception and movement patterns of the area. Society is not expected to perform the installation of billboards regardless of the aesthetics of the building. Besides the need to refer to the local regulations as a reference made to the preservation of ancient buildings.

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Handling Priority Regions and Colonial Buildings of Malang (Case Study : Klojen)

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Abstract

The condition of the historic buildings in the city of Malang underwent many changes due to developments in the case. This has an impact on the value space of the city. Malang is a city with many historical traces of tales in the form of historical relics are still visible to this day. There are some areas that have strategic value and culture need to be handled (conserved). This historic area is handling efforts then poured into the form of descriptive research approach to research. In formulating alternatives handling conducted interviews to collect against several respondents interested parties such as academics and other experts (derived from institutions). The data will be analyzed by the method of AHP analysis, and will eventually be known priority handling will be done in the area and the historic buildings along with the alternatives.

Keywords: Historic Buildings and Areas; priority handling; Descriptive Methods; AHP

1. Introduction

The existence of an ancient historic buildings reflect the story of history, the way of life of culture and civilization of the people. There are a couple of the significance of the existence of an ancient historic building among other economically, ancient building is a historic tourist attraction, socio-cultural aspects of the rights of the ancient building was a close bond between fostering the present and the past and create pride and self-respect as a nation and of the physical aspect of the ancient historic buildings that will enrich the environment faces and create the city's distinctive identity , unique and characteristic (Budiharjo, 1989) [2]. The gradual is followed by the historic presence of modern buildings in addition to remove past history also indirectly cut off views of the city and eliminate the need for conservation of the city's identity against a legacy of historical building in the city of Malang, closely related to the process of the development of architectural forms is to protect some buildings of historical legacy which is expected to be able to describe the historical development of architecture in the city of Malang.

Malang is currently undergoing development of population and an economy that is growing by leaps and bounds. This is in itself encouraging development which is also increasing every year. One of the changes is the condition of the historic building was destroyed, if this is allowed then it would have an impact on the loss of city space values that are not in accordance with the original concept or Malang lost his true identity. Malang has a number of sub area, when are reviewed from a socio-cultural point of view, and more specifically seen from approach to the history of culture (culture, history). Its value will be realized, then the area that need handling wisely gets, i.e. with the conserved and utilized for various purposes for the present and future.

2. Methods

2.1. Research Approach

The research approach used is a qualitative approach. The qualitative approach emphasizes the development of narrative or textual description on the phenomenon that is examined. The qualitative method prefer the way it works with explained the research results based on assessment-assessment of the data obtained. The qualitative approach is divided into several methods including a descriptive method. The descriptive method is one of the types of research methods that attempt to describe and interpret the objects according to what it is.

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2.2. Identification of Historic Change Analysis

Identify changes in historic buildings by using the method of analysis of descriptive and Evaluative analysis. Descriptive research purpose is to make pecandraan (process; the way; the Act describe) systematically, factual, and accurate about the facts and the nature of the population or specific areas. This method of analysis by way of looking at the State of the object of research through the explanation, understanding or explanation against the analysis that is measurable or not measurable. Analysis of evaluative covering changes to the building and peentuan kritria preservation.

2.3. Analytical Formulation Efforts Handling Using AHP

AHP is used to determine the priority of policy. The use of this method for the determination of priority factors used, i.e. by using the techniques of the paired comparison is then processed so the obtained weights on each factor. This analysis tool is run to do interviews to some expert stakeholders, namely Governments, practitioners and academics. The scale that is used in the calculation of weights is to a scale of 1-9.

Table 1 Respondent as a Representation of an Expert in The Area and Historic Buildings

Main Stakeholders	Interest Groups of Stakeholders	Interests
Department of Culture and Tourism, Malang	Culture	Related area and historic buildings
Academician	Historians and Preservation Architecture	Understand theoretically about history especially the preservation of the building architecture

Before undertaking the process of AHP to know in advance the structure of the hierarchy of this process. The hierarchy is composed of four levels. The first level is the selection criteria in the determination of Priority areas and historic buildings. The second level is the capital or the factors that determine the parameters that are used to define the area and historic buildings. There are three kinds of capital that is needed to process an effort handling area and the historic building that is among others: criteria for historic buildings, historic area criteria, criteria of preservation in determining the object to be dikonservasi, typology of the building, formulation and handling upayan actions in conservation. Each capital effort handling area and historic buildings consist of several sub-criteria which occupies the third level with details of sub criteria as follows: 1) criteria changes of historic buildings have sub criterion age of buildings, constructions, the historical value, and the function of the building, 2) analysis of untainted have sub criteria significantly, authenticity, and integrity 3) formulation efforts have area handling the sub criterion, namely external and internal , actions in conservation have sub criteria i.e., restoration, reconstruction, renovation, rehabilitation, adaptation and demosili. The following figure displays the hierarchical structure that will be processed through the method of AHP.

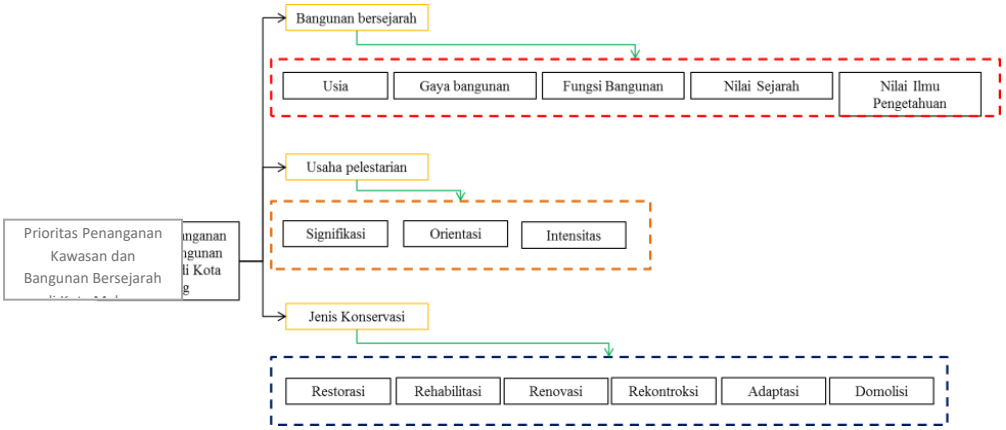

Fig. 1 Matrix effort handling area and historic buildings

3. Discussion

3.1. Change to Historic Buildings

Change of historic buildings in the city of Malang are described by dividing the block historic district that is seen by virtue of the physical boundary of the area and function of the historic district.

a. Block I (The Function of Central Government)

In this block, namely the round square area (monument) has been a lot of changes. As for the change is a change in the shape or form of the physical architecture of the buildings around the square or monument which was, at the time of colonial called by j. P Coen Plein (square bunder). In addition to the physical building, the function of the building also underwent many changes. Change the shape of the building is happening from the beginning until now, the changing shape of the building is low, because the style and shape of the building is still maintained and preserved, although there are some buildings did not experience a change of function.

b. Block II (Ijen and Gajayana Stadium)

In block II i.e. Ijen area has been a lot of changes. As for the change is a change in the shape or form of the physical architecture of the buildings such as the houses which are colonial home. in addition to the physical building, the function of the building also underwent a lot of changes as well as the emergence of new buildings. change the shape of the building is happening from the beginning until today, changing the shape of the building, because of the low, the style and shape of the building is still maintained and preserved, although the stadium changing shape but gayajana does not change the shape of the region.

c. Block III (Town Square)

In block III, i.e. the area of the square is the city's first downtown district in malang, prior to the formation of malang city. More changes that pretty much looks compared to the block I (the square monument), changes that occur is a change in the functions of the buildings and colonial buildings form as well as the formation of new buildings. Change the shape of the building is happening from the beginning up to now change the shape of the building is quite high, because the style and shape of the building is still there which is maintained but quite a lot of changes are clearly visible on the town square Malang, Rainbow Hotel, and the Ramayana.

d. Block IV

Block IV is part of the Hapless city centre which is a colonial and has undergone many changes. This block changes that pretty much invisible, such as the change of the function of buildings, building forms, or layout. change the shape of the building is happening from the beginning until now, Block IV (Area PLN) changes the shape of the building is low or in the event of this not happening are significant building changes, because the style and shape of the building is still maintained and conserved.

Fig. 2 (a) Office Of The Ministry of Treasury of Colonial Era, (b) Office Of The Ministry of Treasury of Colonial Era Today

3.2. Formula of Effort Handling Area and Historic Buildings

This analysis using AHP for handling areas and historic buildings in the city of Malang. In doing the analysis of AHP, there were some respondents who were involved in the field of academics and Government (agencies). As for the variables assessed for priority handling, namely building history, untainted and types of conservation. Based on the results of the analysis that has been performed, the obtained results that handling area of the historic building with authenticity has highest value i.e. 0.714 and inconsistency is 0.00. Authenticity is a State which describes the characteristics of authenticity in the middle of the main variables external environment for the authenticity of its territory, namely:

a. The Plurality

It is said to have a plurality of values if the identity against a things are plural or already found in many places. Of the situation in the field, plurality is namely building Mayor, because the building has a lot of architecture found in other areas.

Fig. 3 Plurality (Balaikota)

b. The Scarcity

It is said to have a value of scarcity if such rare and historic buildings are not replaceable. Of the situation on the ground, conditions of scarcity is that is building the Mayor, because the building functions as the seat of Government and as an icon of the city of Malang. and in front of it there is a monument that is the result of the struggle of arek arek malang-in the fight for rights and obligations as citizens of Malang.

Fig. 4 Scarcity (Alun-Alun Tugu)

c. The Role of History

It is said to have had a role in history, if the buildings of the urban environment which is the location for an important historic event for preserved as a symbolic bond between previous and present events. Of the situation in the field, the role of history in question, namely the square pillar, because the monument square functions as a historical Spears-arek arek malang.

Fig 5 Alun-Alun Tugu

d. Strengthening The Image of The Region

The benchmark used is the building that became a landmark for its environment, in which the presence of such buildings can improve the quality/quality and image of the surrounding environment. Of conditions in the field situation, strengthening the image of the area in question, namely the square monument, City Hall, and the station.

Fig. 6 Image of Alun-Alun Tugu

e. Peculiarity

A benchmark used to assess privilege/fabulosity a building is a building that has certain special properties so as to give the impression of a monumental building, or is the first for a particular function (for example the first mosque, the first school, the first church, etc.). The impression of a monumental building is the monumental scale of votes owned the building. The sense of scale in asitektur is a quality that connects a building or space with human ability in understanding the building or space. Whereas the definition of monumental scale is a scale with an object that has a particular value, so that people will feel the grandeur of the room. By looking at the building that has the monumental scale of the expected observer will feel impressed and amazed, but instead feel fear because feeling small and fragile.

Of the situation in the field, keluabiasaan/privileges is meant i.e. complex school. because the building has certain special properties so as to give the impression of a monumental, or is the first building to a specific function.

Fig. 7 The First School

f. Functional

It is said to have functional value, if it can support the preservation of function but can have other functions such as community service functions and the functions of the service. Of the situation on the ground, functional condition in question that is City Hall, and the station, because the building can support the preservation of function, but also serves as a community service.

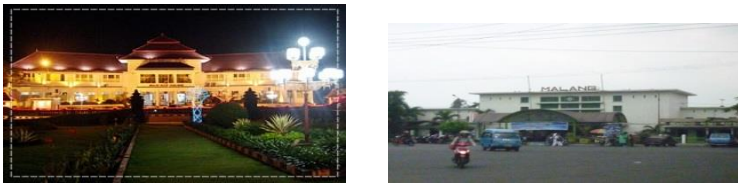

Fig. 8 Functional (a) Balaikota, (b) Stasiun

g. Originality

It is said to have a value of originality if it still retains its authenticity (original meaning that is his style and form is retained in accordance with the original).

Fig. 9 Originality (Balaikota)

4. Conclusion

Malang is experiencing rapid development, both in terms of physical, economic, and socio-cultural. These aspects are certainly bring changes to land use and environmental functions of the city which resulted in a decline in the quality of the image of the neighborhood. To overcome this is to protect and preserve the architectural characteristics of the Hapless City assets in the form of artefacts (historic building). Handling priority areas and historic buildings in the city of Malang with keeping otensitas in the area. Otensitas aspects of handling certainly can reinforce the image of the historic district as the identity of Malang. In addition to handling on aspects of otensitas, will be performed also in the area of preservation and historical buildings in the city of Malang.

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The Influence of Baubau Development to the Image of Buton Palace Fortress Area

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Abstract

Along with population growth and the activities which are more increasing, Baubau city begin to go into development displacement from seaboard to hill area which is close by Buton Palace Fortress. City development in the range of fortress becomes a threat in influencing existence of Buton Palace Fortress, especially the image of fortress area. Accessing the area freely also makes Buton Palace Fortress as track which is often accessed by the citizen in their daily activities. This research aims to know the characteristic of development factors Baubau city and to know the characteristic of the image of Buton Palace Fortress area, also to know influence of the city development factors toward the image of Buton Palace Fortress area. Choosing of study area is based on three consideration, which are number of population, subdistrict orientation to Buton Palace Fortress, and service scale, so it is gotten four subdistricts which are Batupoaro Subdistrict, Wolio Subdistrict, Murhum Subdistrict, and Betoambari Subdistrict. Descriptive analysis method is used in this study's methodology to know the characteristic of city development factors (physical factor, social factor, economic factor, land use factor, movement pattern factor) and to know characteristic of the image of Buton Palace Fortress area, moreover, explanatory analysis by using path analysis method is to know the influence of city development factor to the image of Buton Palace Fortress area. The result of this research is founded that there are three development factors, which significantly influence the image of Buton's Palace Fortress area by influential as big as 54,5%. The three influential factors are physical factor, movement pattern factor, and land factor.

Keywords: city development; image of area; path analysis; Buton Palace Fortress

1. Introduction

Buton Palace Fortress that is located in the hills is the starting point of Baubau development which then shifts to the coastal area [6]. In 1996 until 2011, population growth and region enlargement became the cause of Baubau development which encouraged development direction to return to the hills [7].

Buton Palace Fortress area is area that has high historical value. The location that close to the central city of Baubau and the shift of city development that head to the hills, can bring threat to the existence of Buton Palace Fortress. The existence of Baadia District, displacement of hospital and Mayor's Office in the range of Buton Palace Fortress make one of the streets in fortress area become the connecting line and main access of the society. Previously, it had been done the enlargement one of the fortress gate which is one of the image elements in order to be passed by the vehicle, enlargement and asphalting road, also damage happen in wall side of fortress either because of nature factor or human factor.

This study aims to know the characteristics of city development factors around of fortress, to know the characteristics of the image of Buton Palace Fortress area, and to know the influence between city development factor and the image of Buton Palace Fortress area.

Selection of the study area was done by three considerations which are number of population, regional orientation, and service scale. It found four subdistricts which are Murhum Subdistrict, Betoambari Subdistrict, Batupoaro Subdistrict, and Wolio Subdistrict.

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2. Methods

Procedure of data collection in this study consists of primary data source (field observation, interview, questionnaire, documentation) and secondary data source (literature reviews and data of related parties).

The population in this study is the society of Betoambari Subdistrict, Murhum Subdistrict, Batupoaro Subdistrict, and Wolio Subdistrict. Based on Slovin formula, it is obtained that samples are 100 respondents. Furthermore, by using sampling technique which is used quota sampling, respondents are divided into 25 respondents for each subdistrict. Acquired respondents are considered by two things that are respondents' age and length of stay.

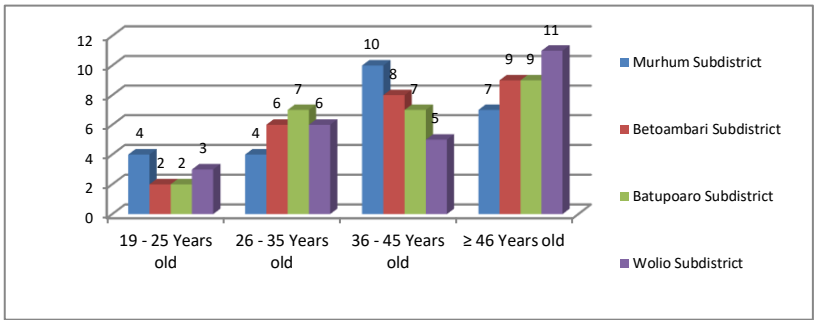

Fig. 1. Number of respondents based on age

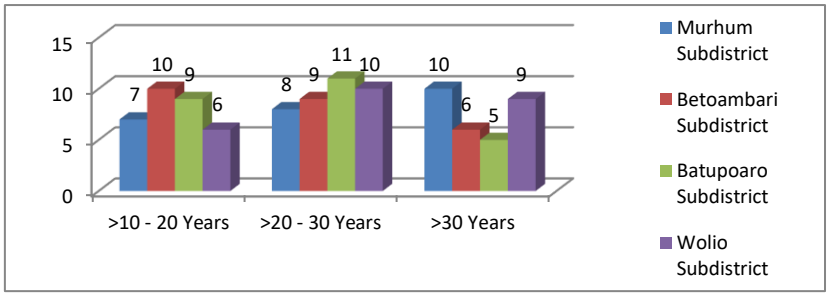

Fig. 2. Number of respondents based on length of stay

Analysis method that was used in this study is descriptive and explanatory methods. Descriptive method was used to know the characteristics of city development factors around fortress and to know the characteristics of conservation of Buton Palace Fortress. Explanatory method was used to know the influence of city development factors around fortress area to conservation of Buton Palace Fortress by using path analysis.

3. Results

The discussion of this research is to discuss the influence of city development factors to the image of area.

3.1. History of the Region

History of the formation of Buton Palace Fortress area was marked by the arrival of four leaders or mia patamiana, which are Sipanjongan, Sijangwangkati, Simalui, and Sipanjongan. By the role of mia patamiana, this state of Wolio grew to become the starting of the central of kingdom government and the next of Buton Sultanate. They also had King of Buton I as the leader.

The time when Islam came into Buton Kingdom had been new era of this region history. The way of life that based on Islam became pioner of government transformation from kingdom to sultanate. King of Buton VI, Murhum, declared that believe in Islam and became the first Sultan of Buton. Then, it was followed by his people and building of Masjid Keraton. Murhum adapted various legal requirement based on Islam value. After that, in 1906, Dutch that previously had interlaced cooperation with Buton Sultanate, made Asyikin-Brugman Treaty that cause Dutch have the power and control of the Buton Sultanate.

The end of Buton Sultanate was happened in Muh. Falihi era. In this time, there were there different periode which are Dutch Colonial, Japanese Colonial, and State of East Indonesia Government. Independence period in 1951 decided that Baubau including Buton Palace Fortress became Teritorial Level II in Southeast Sulawesi.

3.2. Influence of City Development to the Image of Buton Palace Fortress Area

The influence of city development to the image of Buton Palace Fortress was analysed by using path analysis. The result, from the five city development factors that exist, it found that only three city development factors which significantly influence to the image of Buton Palace Fortress. They are physical factor, area factor, and movement pattern factor.

1. Physical Factors Significantly Having an Affect on the Image of Area

In the study area, there are four subdistricts that are the most dense populated subdistrict in Baubau. The four subdistrict are located stuck each other, and closed to Buton Palace Fortress area. The geographic condition of dense populated region is coastal area which has limited range area. The development that can be happened in the future potentially shift to the hills, or in the same direction with the location of Buton Palace Fortress. It has wide area and the nature condition support to be developed.

2. Area Factor Significantly Having an Affect on the Image of Area

The influence of area factor is related to area utilizing in study area that is dominated by building area (32%). Range of the using of building area is mostly located in study area of Batupoaro Subdistrict (commerce, harbour, infrastructure, and settlement) and Betoambari Subdistrict (settlement, commerce, education, and transportation). Beside that, Murhum Subdistrict which is location of Buton Palace Fortress now, also is dense by population and growth of education and goverment. Area utilizing that keep develop to Batupoaro Subdistrict with limited area can develop to the hills, or toward Murhum Subdistrict.

3. Movement Pattern Factor Significantly Having an Affect on the Image of Area

Service centre of Baubau is located in study area that is Wolio Subdistrict. The sub-service centre is not too far from Buton Palace Fortress. The location of those central activities create a movemenet pattern. Beside that, population increasing will be accompanied by increasing of area need that trigger development shift to empty area that is in the hills. The number of citizen in study area in 2010 is 99.407 people and increase to 105.528 people in 2013. It means that in three years in study area, the number of citzen increase as much 6.121 people or has growth rate as much 2,01%. Population increasing can keep rising, consider to Baubau is always develop in various sectors. This is easy to be seen by displacement of Baubau General Hospital. This development shifting result in Buton Palace Fortress area become one of crowded connection line for central activities.

4. Conclusion

Buton Palace Fortress area has important historical value especially for Baubau that is as the first central Baubau development. Baubau development in this time has various impacts. One of them can influence the existence of Buton Palace Fortress that located nearby central development. In previous years, there were some changing and damaging to the image of Buton Palace Fortress area. Moreover, Baubau development today shift toward where the fortress is located. City development around fortress which is Betoambari Subdistrict, Murhum Subdistrict, Wolio Subdistrict, and Batupoaro Subdistrict is the most potential to influence the fortress conservation.

There are some factors to see city development that are from physical, social, economic, area, and movement pattern factors. The conservation of fortress can be seen from the image of area aspect.

City development factors are known to have influence to the image of Buton Palace Fortress area. The factors that have influence are physical factor as 0,408, area factor as 0,175, and movement pattern factor as 0,399. It shows that the existence of Buton Palace Fortress in the future needs related parties attention in considering about its location that closed to city's central activities, displacement of area building, and movement pattern development that happen in Baubau, also involve Buton Palace Fortress area directly.

5. Suggestion

For the academics, this study can be continued by digging in other factors outside of this study which can influence the image of area, either using society assessment's point of view or other point of view. Also, use the translation of quantitative indicators in each variable of city development in order that can be countable with using of complex variable. In addition, it needs further studies that investigate from society's social and culture aspects in traditional cultural heritage area. For the government, needs to make tight the policies about cultural heritage area that have been released, and considers about physical, area, and movement pattern factors in arranging the policies. For the society, awareness need is the important element to take care the image of area especially cultural heritage area in order to the image of area can be protected and guarded the existence

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Collaborating Privates and Communities as Place Making Tactical Strategy: A Case Study of Public Space in Bandung

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Abstract

Issues of coordination and partnership as important part of collaboration are now at the forefront of much place making tactical strategy research to find new perspective and solutions on facing new challenges to provide sufficient public space area. The article examines a collaborative approach to the relationship between public-private-communities in provision and management of green public space in Bandung. The purpose is to examine stakeholder collaboration and management roles as well as the interdependence of the provision and management of green public space. Following a brief examination of collaboration, this paper identifies five avenues deserving of further inquiry: the stakeholder motivation, Governance Landscape and Role of stakeholders, Public-Privates-Communities Interaction, encouraging and discouraging factors, and finally, the level of collaboration.

Keywords: collaboration; management roles; green public space; governance; public-private-communities

1. Introduction

In the context of rapid growth and densification, a city facing new challenges to provide sufficient public space area. Public space presence at least 30% of the city area still a utopia, even it has been obligated by Indonesian National Constitution No 26/2007. Major issue e.g. land acquisition, and minimum budget allocation typically hindered the public space expansion and maintenance. Encroachment by illegal settlements, and street vendor also threatening the existing public space which is not widely use. The need of managing convivial public space has been increasing, as well as the raising of public awareness. Healey (1997) [3] urges to shift the planning paradigm from regulating the spaces to managing the organization that use the space to meet the contemporary challenge. At the same time, the will' of stakeholders need to be maintained and addressed so the government can understand the needs regarding a project or plan (Innes and Booher, 2000; Ismail and Said, 2015) [6]. The quality of public space will increase, as well as the intensity of community involvement (Peres, 2016) [10]. To follow the sustain planning process, Bandung municipalities initiate a policy to open collaboration with private and public in managing public space. The policy aiming at raising people ownership to public space and gaining more fund to revive and expand the facilities.

Some conflict of involving privates and communities in managing space has been occurred. Inevitably, public spaces gives strong meaning with its user as many researches has been emphasized (Hernández Bonilla, 2013[4]; Ismail and Said, 2015 [6]; Kolcunová et al., 2016 [7]; Pradinie et al., 2016 [11]). As the the public spaces have been placed as the primary space entity, securing its value is critical for urban life. The deep and locale interaction between space and its user could generate an assertive feelings which produce its identity (Harvey, 2001, p. 47) [2] . The interest of communities to protect the 'opennes' identity and the interest of privates to gain profit and protect their brand value has been distorting the collaborative process. Even so, the privatization in public space able to enhance the quality of the physical facilities and increasing public satisfaction (Nasution and Zahrah, 2012) [9].

The research that tries to test the notion of collaborative governance that promoted by Healey (1997) [3] in Indonesian planning context is still rare. Therefore, the intention of this research is to enrich the academic debate, as

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well as attract attention from policy maker to shift our perspective of seeing public space as place making process, rather than rigid bureaucratic asset. The existing place making effort also need to be criticized as well as synthesized to secure the collaborative value. To some extent the negotiation of public motivation can be entered by private motivation in terms of managing public space. Inevitably, the collaborative value will face temporalities in the future and possibly transfer to other municipalities. Hence, an investigation has been doing to many stakeholder aiming at identify the factors that encourage and discourage private and communities to collaborate in managing a public space.

2. Methods

Three times focus group discussion which invites stakeholders from communities, private companies, and municipal officer has been held to acquire information, and analyze each stakeholder interest regarding the issue. According to FGD results, the place making chain in Bandung can be identified through 6 steps, which start from planning until maintenance.

Stakeholders in-depth interview were also conducted to gather and probe information based on FGDs. In-depth interview needed to capture aspirations and perspective that usually disguise in open forum. In particular, in depth interview covering sensitive issues which formidable stakeholders relationships.

3. Results

The stakeholder motivation and role based on their rights and interest. The government has an interest in encouraging private and public roles to participate in the providing and managing green open space in Bandung. Encouragement engagement aimed to reducing the burden of the budget. At the same time, the private companies in Bandung tend to sponsor the public space that located in high valuable area which most of them function as social instead of environment protection. The intention of companies is to attract more attention of public, which could bring them to wider public acceptance. As the consequences, the public space that located in stigmatized area, and far from economic centre has been neglected by privates' motivation. The private developers have different tendency from other common company. The provision of public space has been done as the compulsory project to obtain building permit. On the other side, the communities' characteristic in Bandung is diverse. The communities do not have consistent energy to continuously involve in managing public space. Typically, it driven by voluntarism that easily disrupted by many factors e.g. professional activities, family, or even likes and dislike.

The same levels of information, which occur in the dynamic negotiation, tend to weaken the role of community. This level of information influences motivation and characteristic from stakeholders in term

of participation, specifically public and communities. The aim of stakeholder collaboration is to build a consensus among stakeholder. For this to be possible, they all must be represented and have equal say in discussions. This had not been majority case in place making strategy in Bandung.

The communities' participation of planning process is minimum; even the municipality has opened the collaboration inclusively. The communities' representatives admit that there are gap between them and government which obstacle the collaboration. The initiatives to improve park mostly came from the government and privates. It altered the participation landscape which is it tend to follow the private interest, and reduce a role for nonprofit motivation. Hence, managing green public spaces that close to their living space, as they have more space for creating ideas and activities. Nevertheless, to some extent the communities typically have limit source of budget and manpower. Their activities could be dependent with extra funding from private companies or government.

The collaboration that have been established still lack of linked between private and communities. Private tend to position the community as a party that will manage activities in the park without further involvement. This happen due to differences that often arise between private purposes related to green public space management. The diversity of community perspective in many cases cannot be facilitated entirely by the private sector. Private sector prefers dealing with government and for fill the administration process, community usually involve conveying their aspirations.

In addition, equality between stakeholder in the provision and management of green public space still need to be addressed. From developer perspective, set rules do not consider business side. For example, government requires developer to provide 40 percent of green space in development. This regulation is affect increase of land and housing prices. Inflation of land price would difficult government later in term of future public green space provision due to

high price of land. Developer also does not have right to maintain land that already sold to consumer. Land has been purchased will be maximized particularly for buildings.

The government actually has a variety of incentives for taxpayers who have the function of preserving the environment. One of them is an incentive for taxpayers who meet the requirements of green coefficients in their land. However, stakeholders, especially public and private sector do not know information about this incentive.

Although hampered by conflicts of interest between public-private-community, some of public green space in Bandung successfully managed with collaboration that could be applied in other public space. This success cases are supported by factors such as company liability in CSR, a government initiative to encourage some innovative cooperation model, developing of Social Environment Responsibility Forum, and a wide range of potential community that have positive purposes in the development of Bandung.

4. Conclusion

Stakeholder participation in the provision and management of green space in Bandung indicate that collaboration has not been optimal. The government has already positioned as a facilitator but still has many tasks to improve the quality of participation through legal, financial, and administration that allow further involvement of stakeholders, specifically to accommodate interest of stakeholders. Social Environment Responsibility Forum should be enabled to encourage the active involvement of all stakeholders and represents the interest of community. Given the balanced power relations, the process of collective decision as an important point in the collaborative provision and management of green space, would effectively maintained.

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Re-defining Smart City Concept in The Uncertainty Era with Resilience Approach

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Abstract

The Smart City Concept originally emerge in the aim of solving various city problems with concern of its environment. As it is developing, the smart city concept in urban planning are now widely used, though the concept itself is still considered as an abstract and vague concept. Hitherto, smart city concept are still warmly debate and talked between, also the profound discussion and study are continuing. Nowadays, the eminent literatures which concern most about smart city are those which emphasize on the development of modern technology and information communication technology. ICT and modern technology are seen as the key of smart city concept. While practically, a city as a complex system should have been engaged with its resilient capacity. Several unpredictable activity which may emerge must be analysed in forming the smart city concept. In the urban planning, when a town is already planned to be a smart city, thus being resilience in every situation is an absolute factor. This paper aim to redefine smart city concept on urban planning through profound literature study in Planning in the Era of Uncertainty context using resilience approach. In this paper, will later thoroughly describe and define what smart city concepts really is, what it does truly mean, and what the exact concepts used this recent times, as well as explaining the relation and linkage of the importance of using resilience approach in defining smart city concept. Resilience factors involved which will be explained will lead us to soft infrastructure approach, such as enhancement in many aspect, i.e community capacity, social and human capital, knowledge inclusion, participation, social innovation, and social equity. Discussion and analysation will be conducted through a deep literature study. The literature review related to smart city concept and resilience will be done using systematic literature review methodology.

Keywords: Smart City; Resilience; Urban Planning; Uncertainty Era

1. Introduction

The city continues to develop with the innovations and progress. According to United Nation, The city generates 75% of global karbon emission and consumes two third of world energy, more over, due to urbanisation and economic growth, energy consumption is expected to rise to three fourth world energy in 2030. More than that, the UN has estimates that 66% of world population will reside in urban area [1]. This situation will certainly increase the amount of carbon dioxide, the greenhouse emissions, congestion, and waste disposal that will affect public health. This will also create greater challenge in dealing with air pollution, population density, waste management and human health [2].

During the last years of the 20th century, two major phenomena arise, namely urbanization and information technology [3]. Ever since the 1990s "smart growth" concept began to spread due to public response in seeking for solutions to face population density, congestion, air pollution, running out of open space and the soaring cost of public facilities [4]. In order to deal with saving the earth and human health, the idea of smart city evolved, an idea or concept of which people had hoped will be able to solve city problems with the main concern of taking care of the environment itself [3]. Internationally, smart city concept emerge in order to obtain the goal of *Kyoto Protocol* of which said committed on reducing emission levels according to or based on international scale approved. Driven from that, the smart city has now been widely used, supported and adopted by many institutions such as European Commission Setis-EU, OECD, etc. That goes along with the rapid raise of the number of research and publications conducted related to the topic ([5] & [6]).

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As this concept has then widely used, there are still unclear understanding left aside its definition ([7]; [8]; [9]; [10]). Based on mutual understanding made by European Commission, smart city is a concept that could achieve sustainability through the wide range use of technology [11]. Therefore, the main objective of *smart city* is to level up the sustainability with the use of technology, hence, *"smart sustainable cities"* are seen more suitable and accurate compared to naming it *smart cities* [12]. In addition, terminology used related to *smart city* has developed in accordance to different definition as well, such as *virtual city* [13]; *digital city* [14]; *knowledge city* [15]; *wired city* [16]; *ubiquitous city* [17], and many more.

Currently, literatures explaining smart city are quite a lot and continues to pile up, some of the most prominent are those which focus on the development of modern technology and information communication technology. Out of some literatures used, the focus of the discussion can be classified into four groups, which is : (1) the consideration of using ICT (information and communication technology) and modern technology as the key of the *smart city* concept [18][19]; [20]; [5]; [21]; [22]); (2) *the* role of ICT and technology in *smart city* to achieve the welfare, effectiveness, and competitiveness on multiple socio economic levels [23]; (3) the utilization of technology products to make living in the big city easier ([24]; and in a greater understanding, (4) the use of ICT and technology are constitute efforts to improve the qualities of life and anticipate anything that might arise as the factor that degradates environmental qualities [25].

Apprehending the *smart city* concept is not limited only in the usage of ICT and modern technology, the widespread of this particular concept to other areas is also still warmly discussed and debate. This theory supported by [26], which states that a city will transform into smart city when it invests in human capital, social capital, transportations, and modern information technology, as well as creating a sustainable economic growth and high quality of life, through a good management on natural resources on participatory governance. [27], also discussion about the importance of community involvement and leadership factor, in an effort to make the smart city concept be implemented well. Other that, there are also needs for community empowerment and factors related [28].

Discussing of Indonesia, in the context as a country, many cities in Indonesia, big cities in particular, such as Jakarta, Bogor, Bandung and Surabaya, claimed that their cities has implemented the smart city concept [29], however whether or not residents in the city is 'smart' or intelligent enough? or whether or not there are equalities and fairness among all level of community both in accessing dan using ICT as well as the modern technology provided? has not been confirmed yet. These sorts of factors has been particularly a challenge in conducting development and implementation of the smart city concept. The resilience concept, which is attempted to be included as one of the factor or indicator in smart city planning is a concept, hoped to increase the resistance and resilience of a smart city in dealing with unexpected predicament, such as natural disasters, terrorism, energy crisis, and changes in climate. When a city planned to be smart, hence it must be prepared to be resilient at all times.

2. Methods

Literature review related to smart city and resilience are conducted using systematic literature review methodology. This methodology is done by compiling previous study which have shown a more comprehend and balanced facts. The synthesize of the result will then be done by using narrative or qualitative techniques. This qualitative approach are used to synthesize the earlier descriptive qualitative analysis. This method is also named as meta-synthesis technique, which is a technique that integrates data to help grasp the idea of the theory or find a new concept in a deeper and thorough level of understanding [30].

Data retrieval in systematic literature review methodology is collected from previous journals, internet search, and recent published study. Steps to be taken in this qualitative systematic literature review methodology [31] are as follow:

a. Formulating the review question.
b. Conducting a systematic literature search
c. Screening and selecting appropriate research articles
d. Analysing and synthesizing qualitative findings.
e. Maintaining quality control
f. Presenting findings

Research using meta-synthesis method or also called sinthesys qualitative data method can be conducted with two approaches. First, by using meta-aggregation and second, by using meta-ethnography [32]. In meta-aggregation approach, the synthesis conducted by compiling previous study related aimed to find the solution of the objective research inquired. Meanwhile, in meta-ethnography, the synthesis work to develop new theory purposely to complete the existing theory. These two approaches will be used in this analysis aimed to find the importance of resilience

factor in smart city concept, which later hoped to be the basis of finding new definition and concept purposely to develop and completed the existed smart city concept.

In meta-aggregation approach, the topic of analysis is elaborated into certain themes to build conceptual framework. Driven from, the relevant search of articles are then carried out, articles found will then be compared one another and summarized. In this meta-aggregation, the synthesis result are "aggregate" from various primary research result with related themes. The process of synthesis will be done through this steps , they are : 1. Extracting relevant themes and concepts from the previous material found [2]. Results of extraction will then be organized into primer findings. [3] the findings will then be classified into certain categories; [4] each categories will then be synthesised into one particular theme (corresponded with the conceptual framework compiled).

From the above explanation, concluded that this analysis will be using systematic literature review methodology conducted with meta-aggregation approach. Meta-agregation done in aggregating relevant previous researches. Therefore, in the meta-aggregation synthesis, the conceptual framework which shown the relevancy, must be made in advance. Then primer study results are plotted into previous identified themes. In other word the result presented in aggregate (descriptive) modelFigures and tables

3. Results

Efforts has been done in actualising smart city concept in urban planning, one of them is by creating method and approach focusing in benchmark and indicator to evaluate and measure the impact resulted. Benchmarking made with the goal to make a comparison between the one planned to be "smart city" and others who are not, based on various factors and idea or the concept [33].

This benchmark method measures smart cities from different perspective as from sustainability perspective, global city performance, resilience, local government effectiveness, urban competitiveness, and good urban governance [33].

Resilience factor has now been considered as one of the perspectives in benchmarking smart city planning, even Desouza and Flanery (2013) [34] made an instrument or benchmarking guidelines of resilience based on evaluation on city resilience and its implementation frame, divided in two city components,which are: resources amd process (physically) and community, institution, and activities (socially). Therefore, resilience factor approach is needed in the development of smart city planning.

This paper aims to redefine smart city in urban planning through profound literature study, in the context planning in the era of uncertainty, carried out with resilience approach. This paper will also thoroughly describe and define what smart city concepts really is, what it does truly mean, and which concept used now, as well as describing the relevancy and linkage of the importance of resilience approach in defining smart city concept. This paper will consist of three major part, and each part will explain about: (1) Introduction, part where it will discuss related factors and background that underlie this research, a brief introduction of definition and history of smart city, and its linkage with resilience; (2) Discussion, this part will define the research methodology used objectively to identify and organise relevant literatures into certain themes to establish conceptual framework of the analysis, as well as discussing smart city plan positioning in the context of planning in the era of uncertainty, also narrating smart city concept and resilience view in terms of its definition, relation, and its relevance in planning a city; (3) Result and Conclusion, this part gives a conclusion on the analysis done aiming to find the definition of a smart city concept based on resilience factors.

4. Conclusion

Urbanisation and information technology growth phenomena has initiates the smart city idea. Initially, this concept was expected to overcome city issues with the concern of its environments. As this concepts develops and widely used on urban planning, as well as supported and adopted by many institution such as European Commission, Setis-EU, OECD, etc. Since then, the publication and analysis related smart city has been vastly developed. When the usage has been vastly spread, however its original meaning and definition are still vaguely define, there are still inconsistency in defining smart city. More over, there are several new terminology used in supporting smart city concept development, for example: ubiquitous city, wired city, knowledge city, digital city and such.

Currently, the most prominent literatures discussing smart city are those focusing in modern technology and information communication technology development. ICT and modern technology viewed as the main key of smart city concept, as it says, the whole planning are conducted based on ICT for efficiency, whereas in fact, it is not the main factor. A city as a complex system are necessary to build with resilience capacity. Unpredictable events might

arise, natural disasters might happen anywhere and anytime, these such issues should be calculated in planning smart city concept as a system. In urban planning, when a city is planned to be smart, then for it to be resilience anytime is an important factor.

This paper aim to redefine smart city concept through a profound literature study, in the context of current uncertainty era, with resilience approach. Literature review related to smart city and resiliency are conducted with systematic literature review methodology. Methodology done by summarizing related previous research and analysis with a more comprehend and balanced analysis. Synthesis result will later be done using narrative technique with meta-aggregation approach These aim to aggregate relevant analysis and research, which then be re-interpretated to gain a new understanding concerning to the definition and concept of smart city.

Based on the above discussion, thereafter, it can be concluded that, smart city concept through its resilience approach can be redefined as follow. A Smart city is a concept of urban planning aimed to create greater quality of life, as well as lessening the environmental impact, through the process of improving its community's intelligence, improving its resilience factor in dealing with unexpected predicament, as well as raising the awareness of technology and information usage, in order to ensure the welfareness and better participation of people in the community

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The 3rd International Conference Planning in the Era of Uncertainty:
Sustainable Nation

Built Urban Heritage Conservation in Islamic Communities: Study Case in Banda Aceh, Indonesia

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Abstract

This paper aims to find the concept of the built heritage related to Islamic community with a case study in the city of Banda Aceh through study literature review, with the context of the planning in the era of uncertainty. In this paper will be elaborated and described what it was about heritage and urban heritage, as well as explain the concept of the built heritage conservation in Islamic communities. Discussion and analysis will be done through its study literature. Literature reviews about built urban heritage conservation and perspective of the Islamic community in banda aceh was done using systematic methodology literature review. This methodology summarizes research results earlier that presents the fact that a more comprehensive and balanced. The synthesis of the results conducted using narrative techniques or technique of qualitative. The discovery paper in this paper is to understand the relationship the built heritage conservation of Islamic communities perspective that consider shari'a aspect, local policies and genius loci in built urban heritage that can affect to heritage planning

Keywords: Heritage; Urban Heritage Conservation; Islamic Communities; Heritage Planning

1. Introduction

The concept of conserved and preserved historic cities in the Islamicate world is a recent development [1]. Heritage planning in historic cities, like the ones in Islamic communities, have to be considered carefully. They often do not represent the conditions that gave rise to the traditional urban conservation and preservation in planning approaches. This emphasis on a discontinuity between the present and the past still is a part of modern practical problem as those included in the Athens and Venice Charters [[2]-[3]] and are often transferred to, or even asserted on, many other parts of the world, where in most cases the past is still very much alive in the present [4]. How to agree with these changes of the historic cities in Islamic communities, therefore, is concern for all those interested in conserving urban heritage and identity. Today, the heritage planning of historic cities has become important as amount of designated urban World Heritage Sites (WHSs) has developed across the world over the last two decades [5]. Banda Aceh has developed with historical city. That heritage city has through in the kingdom, colonial, and independence period. Banda Aceh City as the capital of Aceh Province is one of the priorities in the program heritage city of Indonesia. The reason for determine Banda Aceh as one of the ten cities in the priorities of the program because the city has a rich culture and history, both heritage tangible and intangible. They also zoned the priority area, but it is not comprehensive espescially from perspective Islam communities in built heritage conservation Banda Aceh. Aceh which was once the largest Islamic center in Southeast Asia is currently one of the provinces in Indonesia, which regulate Islamic law. Realization of this particular law into his own challenge for the capital of Aceh in general, and the city of Banda Aceh specifically scope to conserved heritage in Islamic societies. In addition to the application of sharia law in Aceh is also known as the starting point of the history of the spread of Islam in Southeast Asia, the beautiful landscape of nature, the wealth of Islamic history and culture, and heritage sites are also tragedi tsunami 2004.

The concept of built heritage conservation is very complicated in terms of planning approaches, actors involved, technical methods and implementation processes. The literature review of discussion presented in this paper is divided into several sections: firstly, introducing the terminology of heritage and urban heritage and secondly finding relation of built heritage conservation and Islamic societies in Banda Aceh. The paper tackles the literature

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review regarding the evolution of the built heritage conservation concept both intellectually and practically with case study.

2. Methods

Study literature review about built urban heritage in an era of uncertainty especially in Indonesia was conducted using methodology systematic literature review. This methodology was done in summarizes results research that previous presenting the fact a more comprehensive result and balanced. Synthesis result is effected using a technique narrative or technique qualitative. A qualitative approach in methodology systematic literature review used to synthesize research results previous is descriptive qualitative. A method of summarizes the results of the study this qualitative called by meta-sintesis, that is technique in doing integration data for have the theory and a new concept in tiers a profound understanding and through [6]. The data in literature methodology used systematic review done through searching journals via internet and results of the recent research who has posted. Steps to be performed in to do this research, through methodology systematic literature review qualitatively [7]. Research through a method of meta-sintesis or also called with the methods synthesis qualitative data can be done with two approach. The first approach that is use meta- aggregation and meta-ethnography [8]. On the approach of meta aggregation, this synthesis aims to answer questions research by means of summarizes of various research results. While approach meta-etnografy the synthesis aimed at to develop the new theory in order to furnish the theory existing.

3. Results

The methodological framework developed for this paper is summarizes on a review of the international academic literature, collected through a scoping review of reviews to get new information related topic in this paper. This paper also described about heritage, urban heritage and built heritage in Indonesia from literature review that related with perspective Islamic societies.

3.1. Terminology of Heritage and Urban Heritage

Heritage has many meanings and connotations, which vary with the perspective from which we look at it. Behiri (2011) explained that heritage is a symbolic resource, strongly related between of collective memory and identity [9]. Furthermore, Graham (2011: 94) claims that: “The content of heritage is commonly seen as embracing both the tangible (monuments, natural landscapes, buildings and the like) and the intangible (traditions, faiths, myths, folklore, rituals, and others).” [10]. Whether the heritage is tangible or intangible, it acquires a symbolic significance from its architectural elements, its historial value, or its contemporary importance [11]. The Open University [12] described defining heritage as: “Heritage have to be seen as separate part from the search of historic knowledge, as it is concerned with the re-packaging of the past for some purpose in the present and future.” Steinberg (1996) said that most urban planners and architect disposed to define urban heritage as “monuments”. He also states [13] that “this comprehension expel historic residential areas and historic city centres, which equally describe the urban heritage.” Furthermore, there are more “non- tangible elements” of urban heritage, like customs and beliefs that “play important role in the articulation of place and space of the built environment” (ibid). Whether it buildings authenthicity had culture, ,colonial, social, military, religious or economic value, they are all part of the national heritage in this perspective, and the assets of urban heritage must be preserved so that people in the present and the future can get benefit from them.

Built heritage conservation is a “positive”, “dynamic”, and “wide-ranging”, concept exceeding the earlier, narrow sense of “preservation”; the latter means preventing further decrease, whereas conservation actually requires of change. Lowenthal (1985) expresses this with firmly: conservation is “part of the process of change” and it requires the past to be upgraded, modernised, reshaped, and even fabricated to meet contemporary expectations [14]. However, Radoine (2003) said that built heritage conservation has two opposing of a gem, revealing the past in a positive light as inherently valuable and worth cultivating, but also managing and detaining the future by congealing the heritage site in its new form [15]. Thus, the present can fluctuate between a tendency to preserve the past as it was and the forward momentum of a projected future [16]. From either perspective, heritage has a value in educating present and future generations as to the historical significance of their built heritage and the necessity of its conservation [17]. Increased concern over the value and management of heritage is reflected in the literature on dissonance heritage [18], integrated heritage management [[19]-[20]], heritage visitor attraction [20], clarifying the core heritage [21], heritage and postmodern heritage [22] and consuming heritage [23].

The manifestation and acknowledment of heritage is because of the continuing maintenance and use of them by the societies that occupy and utilize them [24]. Cowherd refers to relationship between material culture and living culture, where the local communities who use their built heritage are arguably more valuable as a cultural asset than

the buildings themselves. In this sense, the principles set forth by the Venice Charter are especially inadequate. While the Charter values built heritage as the most effective server of meaning from the past, living cultures also have the responsibility and ability to effectively disease values from the past, values that may not be able to be informed uniquely through the built heritage. Cowherd summarizes that "to the expand it the Venice Charter focuses on the material objects of conservation to the expulsion of their material local cultures, it needs to be estimate, modified or even rejected in

cases where its uncritical application might lead to the separation of a valuable physical culture from its living culture" [25]. Indonesia, like other Asian nations, has a history of challenging the foundations of the global heritage discussion. This resistance must be seen as an authenticity way to prevent the destruction of heritage values that would come at the hands of an inadequate global discourse. Such opposition emerges therefore as reality non-Western understanding of cultural heritage.Major captions (headings) are to be in capitals without underlining, aligned left and bold. Subheadings should start on align left on separate lines. A blank line space should be placed both before and after each heading or subheading. There should be no blank line after the title of the sections. Sub caption begins with the upper case. If you use sub-sub captions, please type it with normal plain letters. The fonts of text should be Times New Roman of 10 pt. in size with single line spacing. At the beginning of each paragraph please indent as on this document.

3.2. Relation of Built Heritage Conservation and Islamic Communities in Banda Aceh

In the development of the muslim community in the world, we can see a separation way as a nation in the value of how inheritance his land. The Egyptians, Jordan, Iraq and Iran including nations that is really appreciate an ancestral estate. Old mosques there still maintained, preserved and give pride of the citizen- in term Rossi called propelling monument [26]. Grave of cleric be preserved, even grave to be sacred. Such as, in contrast many historic site near the town of Mecca now difficult to find, even has been lost. Business the Kingdom of Saudi Arabia building the city of Mecca modern and sophisticated, with a view indulge pilgrims, it turns out that cut off inheritance historic the people. Caravan camels as in the days of who could do seen again, and the city Mecca has changed he followed version of modern American cities [27]. The city can be losing its identity because of the construction of often sacrifice building and regional historical have is an important part of the formation of the city.

Nowadays, the direction of the development of urban development, especially in the old area, is weak controlled so that are likely to die, stopped and concealed, less productive and disorderly. Restoration Ulee lheue Mosque, for example, have deprive of the character primary of dome originally the graceful. Another example, the old area around Mosque and Keraton who conserved covering broad 100 ha [28]. Besides Mosque and Keraton, old town is also has some of objects and a historic landmark, as Taman Sari, Gunongan, Pinto Khop, Pendopo, Grave Sultan Iskandar Muda, Kandang XII, Kerkhof, Bells cakra donya, and the Museum Aceh. Various efforts the local government in determine policy conserved heritage in Islam Community and consider also the concept of a line direction (Kiblat) Mosque Baiturrahman need to be considered also in planning conservation and revitalisation of historical city in Banda Aceh. This conservation must be considered about local identity and shari'a as aspect preservation heritage tangible and intangible in Banda Aceh also how to built urban heritage in Islam communities

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3rd International Conference of Planning in the Era of Uncertainty

PREFACE: The 3rd International Conference in The Era of Uncertainty (ICPEU)

In the spirit of achieving Sustainable Development Goals declared by the United Nations, the 3rd ICPEU looks at harmonizing contextual perspective associated with the innovation and creativity that still considers the economic, ecology, and social value to create sustainable nations. The journey towards achieving a sustainable nation requires recommendations and synchronization from a wide array of stakeholders including academics, private sectors as well as government officials to create inclusive, comfortable and sustainable places for living.

The Urban and Regional Planning Department at Universitas Brawijaya is one of the institutions which has been actively promoting sustainability in all its educational obligations. In the past years, the Department has established cooperation with international institutions, one of which is Kyoto University, to better resonate the awareness to a wider scale. The cooperation with Kyoto University has been extremely crucial for the organization of ICPEU.

For two days, copious data and hypotheses on urban and regional planning issues were discussed and exchanged. More than 200 outstanding intellectuals of the world participated in aiding those involved in such ventures solving any problem that occur. It is only natural that a considerable number of schemes as well as projections were constructed as the result, all assembled in this conference proceeding. It is to our highest expectation that all ideas expressed in this conference could participate and contribute in the global movement toward achieving sustainability.

The committee of the 3rd ICPEU would like to thank the Sixth Southeast Asia Network Forum for the collaboration and to all keynote speakers who participated:

- Prof. Kiyoshi Kobayashi of Kyoto University, Japan,
- Prof. Hans WestLund of Kungliga Tekniska Hogskolan (KTH) Royal Institute of Technology, Sweden,
- Prof. Masaaki Okamoto of Kyoto University, Japan
- Dr. Surjono of Universitas Brawijaya, Indonesia,
- Dr (HC) Tri Rismaharini (Mayor of Surabaya),
- Dr. Emil Elestianto Dardak (Mayor of Trenggalek), and
- Mr. John Taylor as the founder of "Kota Kita".

See you at the next ICPEU in 2019.

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Community-based livelihood management in relations to natural disaster – A study on Teknaf (coastal) area of Bangladesh

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Community-based livelihood management in relations to natural disaster – A study on Teknaf (coastal) area of Bangladesh

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Abstract. Teknaf is an Upazila under Cox's Bazar District of Bangladesh, it's a coastal area with strong influenced by the Naaf river estuary of the Bay of Bengal. The study outlines the major livelihood groups or community in the area. It was observed that the livelihoods are severely affected by climatic and non-climatic changes. For example, the increased salinity of both soil and water has seriously affected all livelihood resources, in particular agriculture, fishery, livestock and forestry. The increase in frequency and intensity of natural disasters - floods and cyclones, has made it difficult for the local people to secure their livelihood. In addition to natural factors, several anthropogenic factors remain the major form of vulnerability for the farmers, fishers and other livelihood sections of the society. This study was an exploratory research with questionnaire survey by random sampling, focus group discussion, and review secondary data. The study observed that the local people have evolved many local adaptive practices to deal with the difficult climatic conditions. Outcome of the study is capacity building of the community with in their available resource; combined crop and fish culture need to encourage; control excessive collection of Natural resources like marine fish, forest tree, alternative income generating activities for farmers & fisherman at lean season and disaster situation need to start.

1. Introduction

Geographically Teknaf is located at 20.8667° N 92.3000° E 20.8667; 92.3000. It has total area 288.68 km2. Teknaf port is the main attraction in southern or south – eastern coastal under the Cox's Bazar district of Bangladesh. Because of tropical weather of Bangladesh most tourist usually go to visit this place during winter or in between winter and autumn (October to March). Maximum of household heads directly depends on artisanal fishery activities such as fisher (57%), fish traders (4%), net menders (3%), boat makers (1.5%), wild fry collection (0.5%) in the study area [4]. Major livelihoods in the coastal zone are agriculture, fishery, salt farming, shrimp culture, industrial and agricultural labour, and extraction of forest resources etc. Livelihoods activities of the people's dependent on natural resources are degrading the coastal ecosystems and invading spaces of biodiversity. The major environmental issues faced by the country includes cyclones and storm surge, land erosion, flood, drainage congestion, salinity intrusion, drought, earthquake, shortage of drinking water & arsenic contamination, ecosystem degradation, pollution and climate change [11].

The study reported herein is based on a survey conducted by Rozina on vulnerability and local practices of the study area as well evaluate secondary data and institutional involvements in various

aspect. In this report tried to identify the scopes and prospects of improving practices of lives and livelihood of study area. Part 1 introduces the paper and Part 2 discusses the objective of the study, Part 3 literature review of related papers, the methodology of the study reported herein Part 4, part 5 discusses the results of the study and lastly Part 6 concludes the paper.

2. Objective of The Study

Climate have major physical impacts on agriculture, industry, infrastructure, disaster, health and energy and consequently on people's livelihood in terms of employment, income and consumption. Various groups in society has experience the impacts in various degrees dependent upon their initial economic conditions (poor or non-poor), location (coastal or non-coastal, rural or urban) and gender. Low economic strength, inadequate infrastructure, low level of social development, lack of institutional capacity, and a higher dependency on the natural resource, make the country more vulnerable to climate stimuli (including both variability as well as extreme events). Addressing present and future problems related to the climatic effect is appeared to be a complex issue for Bangladesh. Considering the above circumstances, it was necessary to conduct current research on "Community-based Livelihood Management in relations to Natural Disaster– A Study on Teknaf (coastal) area of Bangladesh".

2.1 Specific Objective of The Study

Specific objective of the study intended to

- Review livelihood related management policies and practices of the disaster-prone coastal zone communities of Bangladesh;
- Identify climate change issues affecting the livelihood of the area people;
- Identify/Document livelihood systems of the communities in Teknaf upazila of Cox's Bazar district;
- Identify the major problems of the community, ranking and solutions perceived by the community;
- Recommend appropriate livelihood management strategies for Teknaf area.

3. Literature Review

Different level of research has been conducted on the coastal management, livelihood management and related issues in home & abroad. From the existing literature review gives an way forward to know about coastal livelihoods an introductory analysis, living in the coast people and livelihoods, living in the Coast Problem, Opportunities and Challenges, living in the coast measuring quality of life, living in the coast urbanization, resource use by indigenous community in coastal zone of Bangladesh, coastal livelihoods situation and context, generating sustainable employment in the coastal zone Bangladesh - present situation and future potentials etc. All the existing research are divers and covering vast area of coastal livelihood of the country. All the prior studies/ research has objective that are related to this study and not similar. From review all these related documents this study has got a path to go forward.

4. Methods and Materials

This paper is fully based on primary and secondary information collected from different sources. Secondary data collected from existing literature review of various book, journals, reports, website etc. Primary data has collected from the field by visiting physically as well interviewing people form the study area. The integral part was to identify and collect data; they were classified, analyzed, interpreted and presented in a systematic manner to find the vital points. Primary data collected by interviewed of local people with different occupation. Respondent selected randomly. Along with this Key respondent interview, focus group discussion and various stakeholder like government official, NGO officials etc. people interviewed to get a clear scenario of the study area. The assessment activities were carried out in four major steps given below figure:

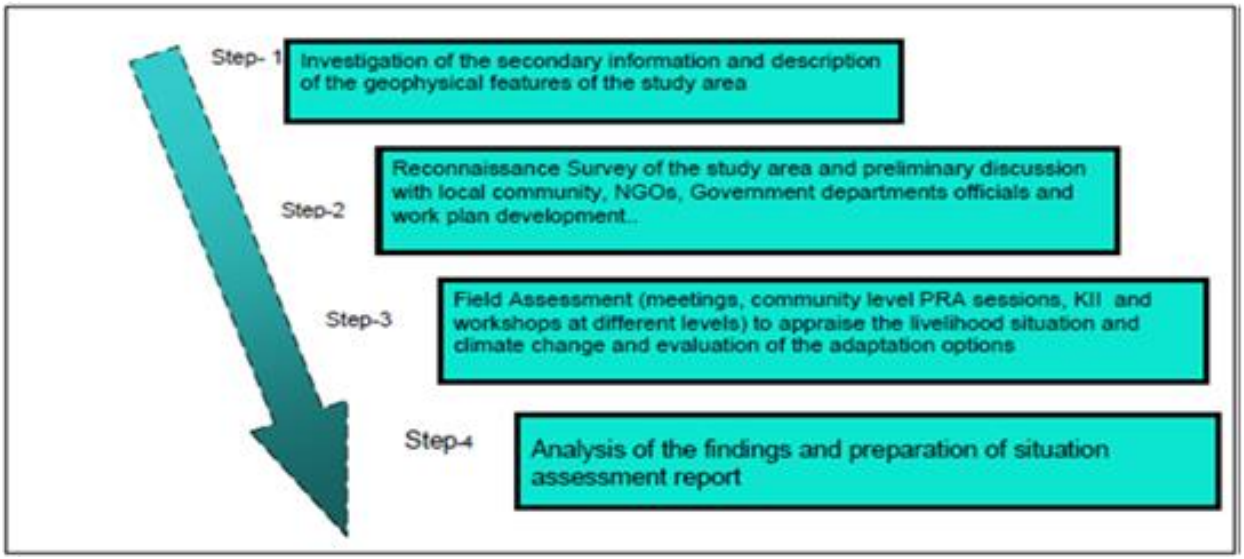

Figure 1. Steps of assessment activities.

5. Analysis and Findings

Different livelihood groups and patterns, including their respective vulnerability, were identified. Assessed local livelihood options and their seasonal dimensions and changing trends. A livelihoods classification was done through a participatory discussion with the community people and based on national data in order to understand the status of the livelihood groups of the study area in below table.

Table 1. Union wise livelihood classification of the community in the study area

Livelihood group	% per union			
	Teknaf Sadar	Nhila	Subrang	Baharchara
Farmer (Salt)	3	7	4	3
Wage laborer (Fishing & Salt production)	19	8	15	21
Fishermen	66	63	71	66
Businessmen	6	14.5	6	5
Service holder	5	4.5	3	4
Others	1	3	1	1
Total	100	100	100	100

The local community in the study area Unions consists of various livelihood groups as mentioned above. Almost all livelihood groups are affected by different types of natural and man-made risks (like natural disaster - cyclone, storm surge, inundation with saline water etc.; climate change – sea level rise, rise of temperature, increase of soil & water salinity etc.) However, the vulnerability of these livelihood groups to different risks depends on various physical and socio-economic factors:

a. Physical assets – cultivable land, irrigation facilities, agriculture/ fishing equipment, livestock, housing conditions, orchard/ homestead garden etc.
b. Human resources- literacy, education, knowledge and skills, availability of health facilities, overall health of the family etc.
c. Socio-economic conditions - Overall social status, access to local decision making groups, cash savings credit and markets, cash valued assets)

As the same risks, may have different impacts on different sectors and members of society, the local communities have been divided into various livelihood groups, i.e. small/ marginal farmers, large farmers, rural wage laborers, fishers, large business men and petty traders. Special attention was given to the specific vulnerability of women.

The degrees of vulnerability (very high, high and medium) of farmers in the four unions of the study area to various risk factors are shown in below table, which is based on focus group discussion and interaction with different organization.

Table 2. Union wise levels of vulnerability of small & large farmers

Major risk factors	Nature	Teknaf Sadar	Nhila	Subrang	Baharchara
Salinity	Climatic	VH*	M*	H*	VH
Tidal water intrusion	Climatic	VH	M	VH	H
Tidal Surge	Climatic	VH	M	VH	H
Drought	Climatic	H	H	H	M
Heavy rainfall	Climatic	H	M	M	M
Water logging	Non-Climatic	M	H	M	M
Flood / Flash Flood	Climatic	M	M	VH	M
Kalboishakhi	Climatic	M	M	M	M
Depression	Climatic	M	M	M	M
Hail Strom	Climatic	M	M	M	M
Thunderstorm	Climatic	H	M	M	M
Cyclone	Climatic	VH	VH	VH	VH
River Bank Erosion	Climatic	VH	M	VH	NA
Insect- pest infestation	Non- Climatic	VH	H	M	VH
Fog	Climatic	NA*	NA	NA	NA
High price of agricultural inputs	Non-Climatic	M	M	M	M
Unavailability of agricultural inputs	Non-Climatic	M	M	M	M
Crop yield reduction	Non-Climatic	H	M	M	H
High Temperature	Climatic	M	M	M	M
Change in land use pattern (from agriculture to shrimp/ Salt cultivation)	Non-Climatic	VH	M	NA	

*Legend: VH- Very high; H- High; M- Medium, NA – Not Applicable

A list of the major local climatic and environmental hazards and the frequency of their occurrence was generated through documents from a website. Concerning vulnerability and the risks, a perceptions assessment was done by taking opinion, about the occurrence, frequency, intensity of the hazards and the impact on livelihoods of the local people. The risk from coastal hazards is characterized by the frequency of occurrence and severity of the hazards. People had been asked to rank the natural disasters by assigning points to them. The most common hazards considered by the respondents are cyclone, storm surges, sea erosion. Below figure shows that in Teknaf Area, 82.7% people, irrespective of their background consider cyclone be most risky. Another 13.9% people consider cyclone to be risky. Around one fourth of coastal people rank tidal surge to be most risky event. Around 67.6% people categorize tidal surge to be risky. Around 85% -95% of the coastal population have rated Earthquake and Draught as either “least risky” or “moderately risky”, whether livelihood groups deviate from this general perception is explored then. It is found that people from all the livelihood groups are consistent in rating riskiness of natural hazards. These findings help to deduce that cyclone and tidal surge appear to be major threats for all the livelihood groups.

A possible future risk scenario including its impact on the livelihood was drawn by the community people, using a risk identification matrix as shown in below table. The scenario was based on the peoples’ past experiences and perceptions, and current trends of increasing risks due to changing climatic conditions and accelerating intensity and frequency of natural hazards. The people perception is that if the climatic conditions keep on changing at the current rate, the impact of the main natural hazard on agriculture and allied sectors will be even more adverse in the next ten to fifteen years.

Table 3. Future risk scenario (based on local community perceptions and linking it with the climate change/ impact data)

Hazard	Vulnerable sector	Climate change impact/risk in coming future
Salinity	Agriculture/crop	Major crop losses per year, lower growth rate of plants, leaf injury and yield losses
	Livestock	Approx. 20% less production
	Fisheries	Loss of domestic fish varieties, approx. 70% yield losses
	Forestry	Plants become infested with different diseases, plants death rate increases, less production of fruits, enormous loss of betel nut, mango, jack fruit and litchi tree
Cyclone	Agriculture/crop	Huge crop damage, especially of Rabi crop
	Livestock	Increased death rate of livestock
	Fisheries	Approx. 50% of fish washed out from water bodies, increased fish death rate
	Forestry	Approx. half of the total tree stock damage
Storm surge	Agriculture/crop	Huge crop losses
	Livestock	Approx. 30% livestock losses
	Fisheries	One third fish loss, increased disease infestation
	Forestry	Approx. 30% of nursery seedling damaged
Flood	Agriculture/crop	Two third loss of T. Aman crop and huge damage to preserved food grain storage
	Livestock	Increased disease infestation, large number of deaths of cattle and poultry
	Fisheries	fish washed out from many fish fields
	Forestry	About 20% damage to nursery seedlings and saplings
Drought	Agriculture/crop	Rice crop damage
	Livestock	Scarcity of animal feed, livestock losses
	Fisheries	Approx. 20 % fish loss, increased disease infestation
	Forestry	Lower productivity of coconut and betel nut, increased fruit dropping, plants damaged due to lack of irrigation
Water logging	Agriculture/crop	Increased fallow land area, sweet potato, water melon, potato, gourd, chili, and tomato crop losses,
	Livestock	Increased disease infestation, approx. 20% less production of live stock
	Fisheries	About 15% fish loss
	Forestry	Approx. 15% seedling damaged

The local population in the study area is trying to adapt the changing climatic and other socio-economic conditions. There is, however, scope for identifying new options and for upgrading and/or refining the existing ones to meet the local livelihood needs. many local elite/experienced persons and various government and non-government organizations officials a number of options have been identified as having the potential to improve livelihoods adaptation and the management of climatic risks in the area. They are in below table:

Table 4. Major Problems and proposed Solutions Locally can be adaptation options

Problems	Solution	Recommendations
Fishes are decreasing day by day.	Banning of Trawling in Shallow (less than 40 Bam) water.	- Organize area based organization and aware the local people about the rules and regulation of trawling. - Inform the positive side of banning of trawling in shallow water. - Imposing a system of huge penalty for trawling in shallow water. - Involving Coast Guard and way along with low enforcing agency. - Increase Government Control over trawling. - Involving small fish boat as a source against trawling in shallow sea.
	Banning all types of fishing in the month of June, July & August.	- Form area based organization and make people aware of the positive impact of this solution. - Involving local elites and aged group in awareness campaign. - Measures should be taken so that no trawler & boat can either enter or exit the fishing ghat in these 3 months. - Government should take the responsibilities so that Hatchery cannot collect mother shrimp in these months and trawlers cannot go to sea. - Employ guard along the sea shore to implement the solution.
	Repairing the existing embankments and constructing new one's so that sea water cannot enter in to lakes and canals.	- At first existing embankments, should be repaired and this repair should be made in the month of October - January. - Quality materials must be used in repairing the embankments. For the spots, too close to sea, bolder sand concrete blocks should be used. - After the repair work plantation, should be done with heavily rooted plants species. - Measures should be taken so that lakes and canals cannot be turned to salt field or shrimp farm. - Embankment maintenance and fresh water aquaculture practice should be done by local conservation groups.
Problems in Agriculture.	Dept. of Agriculture should arrange training for the farmers.	- Farmer training program should be arranged through area based group. - Farmers with a small land or no land should be preferred for training. - The topics of the training should include seed bed preparation, using proper fertilizer pesticides etc. - Successful trainees should be facilitated with loan so that they can implement these trainings in field. - Farmers should arrange at least one meeting a month on different Agro- issues and NGO's should represent the meeting.
	Chemical fertilizer should be easily available in the area and should be properly used.	- First of all a list of genuine farmers should be made by the local area organization and should be trained in right use of fertilizer. - The local Agricultural office should test the Farmer's land fertility in free of cost. - The smuggling of fertilizer should be stopped by forming effective committee involving local elites and politicians. - Punishing the involved persons in smuggling. - Farmers should get the fertilizer directly instead via dealers.

Problems	Solution	Recommendations
		- Government should help the local organizations. - Local farmers should be trained and award to use organic fertilizer.
Number of trees has decreased in the area.	Arrange local community through group and involving them in social forestation in the Government Khas land.	- To make aware the local community social forestry. - Through area based group/ organization, Khas land should be leased from UNO/DC/ Forest office. - Beneficiary group selection and completing the agreement draft. - Strong measures should be made so that conflict do not arise in selecting beneficiary group. - Along with plantation the beneficiary group should be well award about the maintenance of the social plantation. If they cannot bear the expense of the maintenance, then Government should help them and it should be noted in the agreement made between Government and beneficiary group. - A committee should be formed from the beneficiary group who will take care of the whole plantation and willmake solution of all conflict. - Upazila level officers should be involved in all steps of agreement. - Along with social plantation, villagers should be trained in alternative income generation activities and they should be trained on "High tech stove.
	Unnecessary deforestation should be protected and trees should be planted in homestead area.	- Villagers should be informed about the financial value of the homestead trees and plants. - Free Government seedlings of timber, medicinal plants should be distributed by locally formed group and this group is also responsible for maintenance of the planted trees. - The seedlings should be distributed without any favoring to anyone. - NGO initiative should be taken to establish nursery in the area. - Government official should visit the plantation to make people interested in plantation.
Embankment related problem.	Embankment should be repaired and highly rooted plantation should be made on the sides of embankment.	- At first locally formed group should take the permission of plantation on embankment from the respective office. - The plants for plantation should be locally available. For this purpose, nursery, should be established. - The villagers should be trained on plantation & plantation management. - The income/ profit from the plantation should be divided 50/50 between the local groups fund and plantation care taker. - The plantation should also be used in other income generative activities. - The repair work of the embankment should be directly supervised by Authority; not the contractors. - Embankment should be repaired through "Atel" types of soil. - Physical survey is must before, construction of new embankment. - Regular visit is essential by Government officials in maintaining

Problems	Solution	Recommendations
		the embankment. - The part of embankment which is too close to sea should turn inside. - Along with Government supervision, a local Committee should be formed to maintain the embankment.
Natural Disaster issues	In case of any devastation like cyclone, Storm etc.	- Build awareness about the natural disaster situation. - Ensure early warning system from all level. - Train people on emergency evacuation, rescue, response & recovery. - Strengthening community by cooperative activity like food bank etc. - Insist community to face any problem collectively. - Increase participation, cooperation and collective effort to the community - NGO's and other Government organization should take initiative to increase capacity and insist community to be united for their better livelihood.

6. Conclusions

In Teknaf Upazila, adverse impacts of climatic risks and its increase in near future the lives of local community are badly affected in many ways. In the four study area unions, increased cyclone is ranked as number one risk, causing huge damage to the crops, water and the entire environment of the area. In addition to Cyclone, the other major risks posing direct threat to livelihoods are salinity and floods, storm surge, droughts, water logging, deforestation and forest degradation, insect and disease infestation and virus infestation in fishes. The vulnerability of different livelihood groups depends on various physical and socio- economic factors, deciding the coping capacity of the individual group to resist the disaster impacts. Among the various livelihood groups, the rural wage laborers are at the highest risks, followed by small / marginal farmers and fishers. Women due to number of socio- cultural and other physical reasons are generally more vulnerable to climatic and non-climatic risks. The situation study showed that the local population, vulnerable to various natural and human induced risks is already trying to adapt the changing climatic and other socio- economic conditions. There is however, need for further updating and/ or refining of existing practices. Several adaptation options have been identified which have the potential to improve the livelihoods adaptation capacities and the management of climatic risks in the area. Further research is needed to assess climatic effect on livelihood management of all other disaster prone areas over Bangladesh.

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