平成 29 年度博士論文

Political Ecology of Tin Mining: A Study on Marginalization of Coastal Resource Dependent Communities in Indonesia

（すず採掘のポリティカル・エコロジー：インドネシアの沿岸資源に依存するコミュニティの周縁化に関する研究）

Isma Rosyida (05155020)

A Dissertation Submitted to the Graduate School of Letters, Hokkaido University
In Partial Fulfilment of the Requirements for the Degree of
Doctor of Philosophy

Under supervision of: Masatoshi Sasaoka Ph. D

Regional Science Research Group, Human System Science Department,
Graduate School of Letters, Hokkaido University
2018

SUMMARY OF DISSERTATION

Overall, this study addresses resource-governance pertaining issues in Indonesian Tin mining context. Whilst the focus lies within the local decision-making process on social mining permit issuance and its implication is aimed towards livelihoods in the Island of Bangka. Scholars have become increasingly aware the linkage between the escalating extractive activities and the livelihoods of the affected local community from the governance perspective. It is shown by a large body of literature which has discussed from theory perspectives the mining governance pertaining issues, focusing on a diverse topic such as decentralizing resource governance, regulatory complexity, etc. However, there is a limited body of research which empirically explores the complexity of mining resource governance within local decision -making mechanism from the case-studies approach. There is even less which involve the in-depth sight of multiple resource users and how it is overlapping with their subsistence's, driving the emergence of conflicts over extractive resource development.

Throughout modern history, mining resources have played a key role in human development, powering the industrial revolution and more recently, globalization. The existence of these extractive industries provides economic benefits for both states and locals through tax and revenue generation, along with its potential employment opportunities. Yet, despite its benefit, the extractive sector imposes potential conflict over the mineral extraction. With the surge in demand for mining-derived resources in recent years, the mining-related health and well-being of local communities in many countries has become increasingly politicized and contested, leading to disputes over resource extraction. Furthermore, the underlying reason behind the disputes mineral extraction brings forward negative socio-environmental implications that potentially exacerbate the vulnerability of the affected communities. Tin mining development consequently reveals a confluence of interest and concerns which extend beyond the discourse of ecosystem and landscape changes, such as failure of the governance system.

The subject for contestation and manifestation can be found through public and multiple interest nature of extractive resources, as well as their effect on the environment, this is achieved through both vertical and horizontal conflicts that can fuel marginalized communities' grievances and poor management of their natural resources. Previous studies have found that numerous controversies relating to Bangka Island over tin mining occurred due to conflicts between companies and communities, and the resulting environmental and social problems associated with the revenues derived from their regions. The disputes emerged beyond the communities' struggle to pursue rural livelihoods legitimated as social movements that escalating due to the expansion of the mining industry. Overall, these conflicting issues surge more attention on assessing how the existing governance system works within Bangka`s mining sector.

A paradox arises where all large-scale mining companies including suction dredger companies have clear legal entities that fulfill the basic requirements of licensing whereby one is evident that mining activities have consent from communities, following evidence from the environmental compliance that corporate activity ensuring to have no severe harmful effect on society? But the question is, then, why is the upheaval from the community level emerging? Supplementary, If the company has obtained legal compliance license in accordance with Indonesian law and process obligations of environmental assessment in accordance with the standards of the environmental and social management system, why the turmoil then emerged?

Nevertheless, mining governance is an ongoing process that occurs through inheritance. Consequently, environmental permit means that the decision issue towards the mining permit is a political choice resulting from societal values and expectations. This political choice is meant to include local and possibly dissenting voices. The further question arising is how does the decision-making process over social-mining-mining permit issuance occur? And how do its implications towards livelihood of local pose greater the threats to the coastal and marine ecosystem and that are highly dependent on the availability of these resources? These questions are immense in the scope of genuine concern for fair and effective environmental governance and the people of Bangka who depend on it.

The overall aim of this dissertation is to examine the existing mining governance practice within the scope of coastal tin-mining in Bangka Island. Focusing on two key cases of coastal-dependent community living in tin mining producing area, I explore the decision-making processes at the local level in issuing the suction dredger operation social permit. I further analyze the reason behind their acceptance and rejection of suction dredging operation and how it creates dilemma within potentially affected communities. These include whether communities, and individuals that have a meaningful opportunity to participate in the decision-making process. Discussing how they are treated in the decision-making process, and ultimately whether decision makers adequately account for impacts upon community well-being and their way of life. Then finally I discuss this study in a broader perspective to provide key areas relevant to a positive future of best mining governance practice for policy recommendation as to how the current situation could be improved.

In this research, I adopt mix-methods that combining qualitative and quantitative study approach. I further choose a multiple case study design which enables me to compare the decision-making mechanism in the issuance of social permit across distinct settings, different jurisdictions, different community context, and different tin mining historical backgrounds. The cases I have selected for this study has strategic significance in relation to the problem of governance arrangements, and the environmental and social impacts of suction dredging mining activity. There are compelling those who really agree, those who disagree, and those who disagree but have to agree, to speak with one voice and give their permission to conduct dredging operations. I have collected data for each case study from a variety of sources and methods, including semi-structured interview and survey with household and key

informants, focus group discussions, seasonal calendars, participatory observations and also secondary data from the thesis, news, and any related documents.

This dissertation consists of seven chapters. Chapter 1 provides a brief explanation based on the background of the study as well as its overall content. It includes a clarification of the main issues, research questions, and main objectives of the study scope, limitation and the significance of the research. Chapter 2 expands on the research methodology used, including the theories and concepts used by the research as references, tools or models to explain the main issues that will be analyzed further in the following chapters. Methods include the selected research areas, respondents, data collection and data analysis techniques. Chapter 3 focuses on the historical overview of tin mining in Bangka Island and how the changing political conditions and the prevailing economic orientation for each regime.

Next, Chapter 4 explores resource-governance pertaining issues focusing on how the local people the issue social licenses for large-scale coastal tin mining in Bangka Island and how such decision-making impacts people's livelihoods. As per the result, in which local community of Tanjung Gunung Village has never agreed or provided any social license to suction dredger operation within village territory. Thus, the reason and process behind the social license agreement become the major focus of this chapter. It further offers an in-depth understanding of local people's views on how and when suction dredging operations should be approved, or not, and how these views shape local mining permit decision-making processes.

This study's findings presented that both economic and the local sociopolitical factors influenced the local communities' acceptance of the suction dredging. The compensation offered provided a compelling reason for agreeing to permit the mining license. Resource depletion and deterioration, a reduction in the quantity and price of fish, and difficulties associated with finding alternative livelihoods were key reasons for opposing suction dredging. Most of the net fishing community disagreed with suction dredging, but the local political system countered and stilled their opposition. The lack of a fair decision-making process for these licenses had been indicative towards an immature democracy.

Following the previous chapter, investigating paradox within communities a newly suction dredging operation, Chapter 5 further discovered the decision-making process within the local resource governance framework in an area with long suction dredging history. All the same, social mining permits issuance becomes problematic when considering locals' interests and their dependency on marine resources, which can be impacted by destructive large-scale mining.

This case study divulges on how the local power dynamics spawn 'grey participation' within local decision-making frameworks and how the imbalanced distribution of impacts and benefits from suction dredger operations shift local people's perceptions, potentially marginalizing them. People who actively participated and have influenced in the decision-making process are generally politically strong and receive minimal negative impacts from the Suction Dredgers operations. Meanwhile, these participants

have more opportunities to generate cash through participating in the mining committee, consisted of the local community selected during consultancy meeting.

The committee holds a strategic position in the village by bridging the locals and the company, particularly relating to the distribution of compensation and royalties. However, findings show that those who are actively involved and dominate the committee are those who generally do not have an interest in the sustainable management of coastal resources and who strongly support Suction Dredgers operations. Others, like the fishers, weakly participate in the Public Consultancy Meetings even though their livelihoods are highly threatened by tin extraction (as fishing and mining extraction share the same ground). Thus, People-oriented, practical approaches are necessary to understand the multifaceted problems in complex coastal social-ecological systems.

Chapter 6 discovers the socio-ecological changes perceived by the Selindung local community in Bangka Island. It focuses on the before and after of the spread due to large-scale tin mining, exploring further how it adapted towards those changes. The case study of Selindung hamlet offers a good illustration of how the communities living in the coastal ecosystem have been exposed to environmental changes because of their dependence on coastal resources for daily subsistence, livelihoods, and related socio-cultural activity.

This case study found that the spread of tin mining activity on large and small scales was perceived differently by subsistence groups within this hamlet as a key driver of the coastal ecosystem and land tenure system changes, leading to locals becoming uncertain of their household incomes. The household economic conditions, resource availability, relationships, and networking are important factors influencing household decisions on diversifying income sources. Nevertheless, the lack of capital (physical, financial, human), limited skill, and low education levels impacted on the locals diversifying their income sources. Thus, landless households faced a greater challenge in adapting, particularly fishers who faced ongoing fish depletion yields due to suction dredger and small-scale coastal mining. The landless fishers are potentially marginalized by engaging in mining activity which is an economical, socially, and environmentally unsustainable alternative livelihood. Therefore, future policies need to address those key issues for securing local's lives and livelihoods, as for some it is their only source of income.

The final chapter brings together the findings from the case study chapters to provide a strong analytical synthesis based on the specific objectives of the study. Within the context of coastal tin mining governance, the current intensification of tin extraction development in the coastal area is strongly driven by the depletion of tin stock in the land area. It is no doubt that it has created different challenges, especially for the locals whose life depending on the coastal resource, such as traditional fishers. To some degree, this brought dilemma and contestation because both tin mining and fishing is situated in the coastal ecosystem, and both have to be utilized for the sake of people`s prosperity. Nevertheless, it is vital to notice and take note that this contestation is not just a business conflict that

is driven by the economy, but also a political power conflict with varying degrees of interest and power of each stakeholder involved. Each stakeholder is contesting arguments on legal and regulations issues for the political power and structures, such as revenue generation issue, mining concession related issue, etc.

It has been made evident in this study that the most affected people from both research sites perceive that tin resource governance failures exist at least in the general aspect of the decision-making mechanism and benefit and impacts distribution. Locals cannot perceive fair involvement in the decision-making process because equity and justice aspects are not within the concerns and do not allow them to speak out. Consequently, uneven impacts and benefits distributions emerged following the injustice governance application the failure of local government in both sites aimed to fairly bridge the local's interest and the private's interest was manifested through their unnatural standpoint.

In order to achieve good mining governance, it is recommended that people-oriented, together and come to conclusions of taking practical approaches. This was necessary to understand the multifaceted problems in complex coastal social-ecological systems. The decision-making processes should make a serious consideration with issuing mining permits. It should consider both justice and equity from the perspective of all related stakeholders to avoid conflicts of interest. The following key recommendations are identified on best practice for good-mining-governance in Bangka Island: first, Public Consultation Enhancement, second, Accurate Attitudinal surveys, third, Proper Communication and Information Platform and fourth, Strengthening Local Democratic Institutions, fifth, Formation of Liaison Group and sixth, Community Development Initiatives. Finally, all of these key recommendations won't be achieved without the seventh point, Support Equity, and Justice.

Understanding governance and rights regimes in Indonesia's coastal tin mining context requires that analysts recognize the rural development dynamics through conceptual lenses that are considerably multi-dimensional. While dominant discourses continue to emphasize a need for law enforcement, this study has emphasized that the multiplication, overlap, and ambiguity in the roles of government institutions, and the lack of understanding about inter-linkages between local labor rights and environmental management, have perpetuated a more fundamental development problem which marginalizing the powerless affected local.

Scholars should give more attention to how institutions engage the marginalized locals concerns and how such efforts relate to the centralization/decentralization of power and the dynamics of social mobilization and collaboration. Researchers should form partnerships with community-based institutions to encourage adaptive understandings of power imbalances in development planning, corruption, and increase understandings of local rights discourses vis-à-vis mining issues continue to evolve. Civil society organizations and government agencies should pursue development planning in ways that do not marginalize vulnerable locals in the aforementioned ways by championing property rights systems that privilege powerful elites at the expense of local rights claims. Empowering village,

sub-district, district institutions with greater capacities to regulate *and study* the mining sector, with clear mandates for assistance and monitoring, should be seen as vital to ensure the idea of justice, democracy and equal participation in guiding decision-making processes that affect them. Ultimately, effectively mitigating environmental and social risks requires that scholars and policymakers honestly come to grips with both the immediately visible and less visible institutional problems of inequity in the mining sector that have so far endangered coastal communities.

ACKNOWLEDGEMENTS

In the name of Allah, the Most Gracious and the Most Merciful Alhamdulillah, all praises to Allah for the strengths and His blessing in completing this dissertation. He bestowed on me to enable me to alhamdulillah (praise be to Him) successfully finish this thesis. Words are insufficient to describe my gratefulness and appreciation to Him in the whole process of the preparation, compiling and writing of this thesis. In moments of distress, He guided me, showed me what to do, removed all obstacles from and lighted my path, inspired me, eased the tedious task of writing, and gave me surplus energy so that I may stay up night after night, putting down words on paper. Without Him I would not have been able to undertake this daunting task. He is my world, always there in every moment! What matters to me is that He accepts this contribution of mine that He inspired me to write; assisting me by sending me various messengers at every crucial turn. Thank You Allah!

I would like to take this opportunity to gratefully acknowledge the support and cooperation of many individuals and institutions during my study. This thesis has been kept on track and been seen through to completion with the support and encouragement of numerous people including my well-wishers, my friends, colleagues and various institutions. At the end of my Dissertation I would like to thank all those people who made this thesis possible and an unforgettable experience for me. To express my thanks to all those who contributed in many ways to the success of this study and made it an unforgettable experience for me

My parents deserve the best of my gratitude for their selfless sacrificial life and their great efforts with pain and tears and unceasing prayers has enabled me to reach the present position in life. My brothers deserve all the credit for not only this thesis but also for all the good things I do in life. Thank you both for your patience and the unconditional sacrifices you have made. There is no part of this journey which does not include you. Thank you for always being there. To my fiancee, Usama Hafeez Thank you for your continuous support and encouragement. Thank you for always there cheering me up and stood by me through the good times and bad.

My advisor Associate Professor Masatoshi Sasaoka and Professor Taisuke Miyauchi has been very supportive throughout the process. Starting from the conceptualization of the research proposal to finalization of the thesis, he has remained a constant source of guidance and encouragement. Thank you, Masatoshi Sasaoka Sensei and Taisuke Miyauchi Sensei, for being there during both good and difficult times - and offering your wisdom and support. My sincere thanks to the members of my advisory committee which consisted of Professor Hiroshi Oda, all at the Hokkaido University, provided some very insightful comments on the previous version of this thesis and I would like to offer my sincere gratitude to her.

First and foremost, I would like to thank All the people of Bangka Island for their unconditional friendship, support, and collaboration. My special thanks go to the villagers of my study villages – Air

Putih and Tanjung-Gunung- for hosting this learning process and for their unflinching cooperation in sharing all the information with me. Members of WALHI (Wahana Lingkungan Hidup and Fishers Union provided their experience and knowledge on the history and current issues in the area. They added a wider perspective to the study by sharing information on developments of my research.

The local, regional and state government department officials in Bangka Belitung Islands Province, Governor, District Departments of Environment and Forest, Fisheries, Cooperatives, Several NGOs, academic and research institutions and advocacy groups provided excellent support during the course of the study. Thanks, are also due to a number of colleagues and friends in India for their many insightful discussions and help during the field research.

I am really grateful to all my lab members and my wonderful colleagues. Helmi, Waheed, Emon, Audina, Syou, Nupur, Kazuki, a special mention for their help and care during my study. Thank you for your time and support because without you the last stretch of the journey would have been far more difficult. Finally, I acknowledge the extensive support that I received from the Government of Japan. My study has been supported by Japanese Government, through MEXT Scholarship for the last 5,5 years of my study period. I gratefully acknowledge their financial support without which this work would not have been possible.

Isma Rosyida
Sapporo, Hokkaido Japan
February 28th, 2018

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1
INTRODUCTION

In chapter one, I present the introduction and background of the study, stating the problem, objectives, research questions, scopes of research, limitation of the study and its significance.

1.1 Background

In general, this study addresses resource governance pertaining issues in Indonesian mining context. Whilst the focus lays within the local decision-making process on social mining permit issuance and its implication towards livelihoods in the Island of Bangka. Indonesia known for its significant role as the world's second largest tin producing country in the world, supplying one-third of the world`s tin need available on the world`s market (Ballard, 2002), with an estimated 70,900 tons of tin mined in 2015 but has the 4th highest tin resource globally (ITRI, 2016).

Minerals have been considered as an essential component for economic benefits for the human beings in the 21st century (Gilpin, 1995) and fundamental for the world's major economies (McLellan et.al. 2009). Growing demand for minerals and natural resources, concerns over resource scarcity, and rising prices are driving extractive industry companies to operate in new environments to obtain the resources they need. Specifically, tin, this mineral also is considered a vital ingredient in a wide range of manufacturing sectors, including consumer goods, packaging, construction, vehicles and other forms of transport. ITRI (2016) in addition reported that currently, 98 percent of global mine production occurs in developing countries, while China and Indonesia have long histories as major tin producers. Having an average total of 104,800 tonnes production per year, tin produced in Bangka is now found in various electronic products around the world. A report by FoE (2014) claimed that for 5.6 billion mobile phones to be created an approximate of 39,200 tonnes of tin solder would be required. Thus, Bangka hold important role in supporting the global industry of tin users.

Since the last decade, many resource abundant developing countries have witnessed a dramatic growth of mineral exploration, including Indonesia (Bebbington et.al., 2008), as five percent of the total Indonesian Gross Domestic Product (GDP) contributed by mineral resources (PwC, 2012). These further brought Indonesia as one of the key minerals suppliers to the global market, attracted many investors with 'newcomers' of mining players from China, India, Russia, and South Korea penetrating the Indonesia market. It would not be accurate to deny the existence of these extractive industries providing economic benefits for both state and local through tax and revenue generation, along with its potential employment opportunities. When looking at development in the local areas, mining sectors in general have contributed significantly to the local social welfare such as; wealth, physical infrastructures like roads, communication systems, water supplies, electricity and some multiple effects like new development in local economic sectors such as local business activities, shops, markets, and

so on (Gifford and Kestler, 2008; Jenkins and Obara, 2006).

However, despite the benefit generation; other implications of the extractive sector activities are the socio-ecological challenges that occurred. Bebbington et.al. (2008) reinforces, previous scholars have further extensively documented that extraction of natural resources is typically associated with unsustainable patterns of development and growth Mining-induced displacement (Robinson, 2003) and environmental degradation (Ericson et al., 2008) have often imposed costs on communities living close to mining areas, without sufficient compensation (Saha et.al., 2011; Mainguy, 2011). Consequently, conflict over the mineral extraction has escalated in communities around the world. Kennedy (2017) argued that this partly occurred because the increased demand requires more resources are being extracted and partly this is because resource users are becoming concentrated in certain areas more extraction in the same areas.

Previous studies and theorists such as Kennedy (2017); Coni-Zimmer (2016); Hilson (2012); Prior et.al., (2012); Campbell, (2012) investigated this matter further presented the conflict in resource abundant developing countries in the global south. The results found present serious concerns over the imbalance of environmental impacts and benefits; to access resources, the threat to culture and livelihoods, the violation of human rights that triggered disagreement. The research collated all highlight similar affects such as being hard to reach, the use of weak infrastructure. Therefore, this is what makes it difficult to weigh the results and monitor how large companies used this practice.

In addition, to the reason behind disputes mineral extraction, it brings forward negative socio-environmental implications that potentially exacerbate the vulnerability of the affected communities as reported by Ladd (2014). In other words, such disparate distributions of benefits and costs of mineral-based development raise questions about environmental justice and the premise that extractive mining leads to local development (Bridge et.al., 2008). Ladd (2014) in his study analyzed economical gains and environmental risks in Haynesville Shale, a natural gas exploration and hydraulic fracking region in Louisiana. his results showed that imbalanced distribution of impacts and benefits which is perceived differently among affected locals created tensions and disputes among locals and between local and company. Similarly, Ballard and Banks (2003) found that indigenous communities in Papua Nuginea have been subjected to massive dislocation and negative impacts of mining exploration done by the private corporation. This study has further elaborated that the adverse impacts of mineral extraction create potential disputes over access to and ownership of resources of the indigenous people who historically attach their kin and lives to the available resource (Hilson and Haselip, 2004). According to Tschakert and Singha (2007), such situation generally drives people to a vulnerable state.

Over the years, knowledge has been accumulating on the socio-ecological impacts of mining and unequal geographies of risk, and the uncertainty embedded in these operations (Bebbington, 2012; Urkidi and Walter, 2011; Walker and Bulkeley, 2006). All the studies mentioned above demonstrate that how and why global resources curse debate emphasizing on the issues of how to harmonize the

mining operation without harming other stakeholders (Hentschel, 2003). All the above is argued that there are two main issues that are the forefront based on the debate of mining development in the recent years. The arguments are related to, firstly, the impact of mining on the environment and secondly, the impact of mining on indigenous people. Hence, for many engaged in the debate, these two issues have been closely intertwined and interrelated to the extent that both can be viewed as potential costs.

Although all the above has been researched and proven that the greatest risk arising from the large-scale mining operation is the mining waste disposal. A careful reading of the East-Asia environment and social development report on the mining and the environment in Indonesia (2000) summarized that the Freeport mine in Indonesia increased the amount of ore processed from about 125,000 tons per day to over 200,000 tons per day, causing spill with an impact covering an area about 30 square kilometers (3,000 hectares) in 1990. The new Newmont mine also is suffering due to its gold mining tailing disposal. This situation opened room for conflicts among different ethnic groups, including cultural conflicts and upsetting of traditional power structures. After the local government and community demanded a greater share due to all this another tension had emerged. One other tension was also similarly affected such as large-scale nickel mining PT Inco and PT Aneka Tambang in Pomalaa and Gebe Island. Due to acid contamination, soil erosion and sulfur-dioxide caused by the smelting process a local protest come to light as a consequence.

In Bangka Island, the large-scale tin mining caused widespread destruction of the coastal ecosystem. Alluvial excavation caused turbidity that brought the coral misery and eventually lead to mass coral die-off (Aspinal and Eng, 2001) and sedimentation causing the death of up to 30 percent of the local coral reef (within one year), water contamination, coastal erosion and noise, without proper mitigation and monitoring (Kaliannan, 2016). Whilst this was not the only damage caused, there was damage at sea. Whereas the damage at sea is incomparable to damage at land, damage at sea is difficult to control and examine because of excavated holes being hidden in the bottom of the ocean.

It is important to recognize that tin mining does not only damage the environment. In fact, tin mining development consequently reveals a confluence of interest and concerns which extend beyond the discourse of ecosystem and landscape changes, such as failure of the governance system. In this regard, Spiegel (2012) found that numerous controversies in the Bangka Island over tin mining governance occurred due to conflicts between companies and communities, and the resulting environmental and social problems associated with the revenues derived from their regions. Similarly, a report issued by Friends-of-the-earth (FoE) Indonesia collaborated with FoE Netherlands (2014) summarized that from 2006 to 2011 there had been at least twelve conflicts between fishermen and mining companies. These conflicts occurred between coastal fishermen clashed with coastal mining companies in all over Bangka, such as *Rajik Permis, Pagan Village, Belinyu Zone -Pesaran Batu Asap and Penyusuk, Belo Laut, and Penganak-Limau Gulf.* More noteworthy is the increasing numbers of tin mining companies that have been granted mining permission (Izin Usaha Penambangan) in coastal and

marine areas become the main reason of conflict emergence. Therefore, during the protest people voiced objections towards the mining, focusing on the negative impacts associated with mineral extraction, justifying the problem with the mining governance systems applied. This further may lead to complete breakdowns of the local community approval with associated costs for the company, local communities, and the broader public.

The cases mentioned above help spotlight the governance of extractive resource, emphasizing on how communities struggle to pursue rural livelihoods legitimated as social movements that escalating due to the expansion of the mining industry. Public and multiple interest nature of extractive resources, as well as their effect on the environment, make them subject for contestation. Furthermore, this contestation will be manifested through both vertical and horizontal conflicts that can fuel marginalized communities' grievances and poor management of their natural resources (Homer-Dixon 2010). Overall, these conflicting issues surge for more attention on assessing how the existing governance system works within Bangka`s mining sector.

Indonesia's political landscape is where the governance of mineral resources has been a subject of numerous high-profile controversies due to conflicts between companies and communities and also due to disagreements over revenue distributions, pollution, and land degradation (Ballard & Banks, 2003; Resosudarmo, 2004, Sarosa, & Subiman, 2009; Shaw & Welford, 2007). Drawing from this above-explained background, governance of tin mining in Bangka Island has become a challenge across each level of government. A paradox arises where all large-scale mining companies including suction dredger companies have clear legal entities that fulfill the basic requirements of licensing whereby one is evidence that mining activities have the consent of the community, evidence of environmental compliance that corporate activity has no severe harmful effect on society? But the question is, then, why is the upheaval from the community level emerging? What was the reason behind conflict raised? Referring to procedure social permit issuance, transparency, and disclosure through a public announcement, participation, and consultation? Why did the protest flare-ups concern to the distribution of compensation? Who protests and who does not? Who benefits more compensation? Who benefits less?

Supplementary, If the company has obtained legal compliance license in accordance with Indonesian law and process obligations of environmental assessment in accordance with the standards of the environmental and social management system, why the turmoil then emerged? If the company already has clarity provided on legal requirements with respect to the issuance of licenses, monitoring and audits at different government levels, why then there are protests and turmoil? If the company already has environmental impact assessment (EIA) with the proper prosecution of environmental and social management plans proper risk assessment at the beginning of a project procedure? Why the protest impacts of mining operation arisen? All these questions further justify that there might be further problems with the mining governance in Bangka Island. However, Batterbury and Fernando (2006)

reinforced that the successes and failures of environmental governance are determined largely by how decision over natural resources are taken and how does it was managed at a local level. Thus, the escalating contestation occurred as the impact of coastal tin mining development, poses big challenges on how to ensure the practice of good mining governance and its sustainability? What is it that needs to be done to inject some blood of good governance and sustainability in the veins of tin mining in Bangka?

However, mining governance is an inherently ongoing political process. Thus, environmental permitting meaning the decision to issue mining permit is also a political choice resulting from societal values and expectations. This political choice is meant to include local and possibly dissenting voices. The further question arose is how does the decision-making process over social-mining-mining permit issuance occur? What is the reason behind their acceptance and rejection and how does its implications towards livelihood of local pose greater threats to the coastal and marine ecosystem, and that are highly dependent on the availability of these resources? These questions are immense in the scope of genuine concern for fair and effective environmental governance and the people of Bangka who depend on it.

1.2 Objectives of the Research

Many research objectives were formulated in response to the research problem and in order to answer the research questions, both of which are outlined above. The research objectives have also tried to provide guidance and direction to the study. The goal of this dissertation is empirical to examine the existing mining governance practice within the scope of coastal tin-mining producing region. The key objective of this study ***seeks to examine the resource-governance pertaining issues in the context of large-scale coastal tin mining activities in the Island of Bangka***. The specific objectives of the study are as follows:

a. ***To explore decision-making process at the local level in issuing social permit of suction dredger operation and how it creates dilemma within potentially affected communities.***

   These include whether communities and individuals have meaningful opportunities to participate in decision making, how they are treated in decision-making process, and ultimately whether decision makers adequately account for impacts upon community well-being and their way of life.

b. ***To identify and assess factors that influence their acceptance and rejection towards suction dredger operation.***

   Many scholars have discussed from a theory perspective the existence of disputes of contested resource extraction and how it should be remedied but there is limited body of research which empirically applies evaluating the decision-making process over resource utilization from the local perspectives and how it creates dynamics within local political area affecting the stability of locals' livelihood and potentially marginalized them into more vulnerable condition. I believe that better understanding regarding the factors that shape the decision-making process will be beneficial to reconsider the better approach to the social

permit decision-making mechanism. Thus, this dissertation makes a unique contribution by presenting a careful and detailed analysis of these contested events within the context of extractive development on the island of Bangka.

c. ***To improve decision making arrangement in issuing mining permit and provide implications for the good tin mining governance for sustainable coastal resource management***

This study aims to provide key areas relevant to a positive future of best mining governance practice for policy recommendation of how the current could improve. What would be fair and effective environmental governance of mining in Bangka look like? How could advances be achieved through developing a roadmap for responsible tin mining in Indonesia? In demonstrating these issues more clearly, this study draws the experiences of environmental and socioeconomic issues in the institutional arrangements and a legal framework put in place, it is also important to identify the problems and to resolve these in the coastal zone.

1.3 Scope of the Research

This dissertation is first and foremost designed as a critical analysis limited to the coastal tin mining governance dynamics rather than complexity of both tin and link mining which the sector is anchored. This study does not intend to analyze the economics of mining since this is already an academic discipline on its own. This study is also not an environmental paper that provides detail aspects of environmental risks and safeguards implemented. Instead, this research focuses on the contributions and obligations of mining companies and communities affected by their operations and their economic and environmental well-being considering the prevailing socio-political situation. The nature of this study is primary data research. The underlying reason for primary data is due to the nature of this study and is aimed at looking at the real-life events and conditions of this field. Therefore, primary data is suited here.

1.4 Limitations of the Research

All though there have been positive attributions found in the research area. There are three points of limitations found during this study;

First, Time, field areas, political situation and financial constraints limited the focus of the research to Coastal Tin Mining Activities in Central and West-Bangka. In fact, Coastal Mining Activities are currently operating in all over regions. South Bangka and Bangka Induk Districts and Pangkalpinang Municipal City have not been looked at as in-depth for this study as was originally hoped due to the constraining factors listed above.

Second, a rapidly changing political environment also presented difficulties and therefore constraints on the research. It is important to notice that during the fieldwork there was changing circumstance within the local authorities as the impact of shifting regulation and turmoil within community.

Third, to get the clarification from the regional and district government, some interviews were conducted in the domains of their working responsibility. However, when it comes to a sensitive issue that potentially leads them into an unsafe position, I received some potentially biased answer. Thus, I should filter the answer given by non-neutral actors.

1.5 Significance of the Research

Whilst there have been various studies on tin mining in Bangka Island, including those focusing on the impacts of tin mining activity, there has not been much research focusing on the social, economic aspects as well as the political processes. There has been a more direct focus on the environmental causes on tin mining in Bangka Island. In addition, most of those tin-mining related studies focus on the inland mining issue, while offshore or coastal mining has not been examined well by the social and political scientist. However, offshore mining is predicted increasing rapidly in coming years as onshore tin deposits are dwindling, while the need for rehabilitation is widely considered as a priority.

Previous studies focused on the governance-pertaining issues within the context of mining sectors in Bangka were mostly focused on the national and regional level (Ibrahim, 2016; Spiegel, 2012, Erman, 2010; 2008; 2007). Very few governance studies aimed to capture the specific issue at the local level. Thus, this study is significant for the quality of the data that is obtained through field visit, in-depth survey and interview with the local community affected community representing different subsistence groups and different socio-economic-political stratification. The findings of this study bring information on the changing of situation and condition of socio-environment in mining operation area in the local level.

This study is local-oriented, with a concentration on the area-specific characteristics in the local research area. Therefore, this study seeks to provide an update on the studies on the dynamics occurring in the mining sector, with the interactions among local. Finally, this study does not serve as a pro-mining paper, instead, this paper tries to take a neutral stand by looking at the actual condition at the local level, and the way that the research object has fulfilled the obligations. The gap between the actual conditions of the research object and the ideal situation serve as a useful policy input as well as it is useful in identifying possible inconsistencies in each stake holder's view that may arise due to the prevailing socio-political environment. In addition, I do believe that the outcome of this study will be beneficial to provide inputs for policy recommendation in mitigating the potential social conflict over coastal tin extraction issues and furthermore, opens up a dialogue about alternative approaches to environmental decision making that can result in exploring appropriate outcomes that are better informed and fair.

1.6 Structure of the Dissertation

The dissertation is separated into seven chapters (refer to Table 1), each with a different issue addressed and its own distinct format. In the first section of this study, Chapter 1 provides a brief explanation based on the background of the study as well as its overall content. It includes a clarification

of the main issues that are included in the research as well as provides a justification as to why the author has deemed this theme as interesting to write an academic paper. It also includes the research questions that were employed as guidelines. The main objectives of the study are clearly stated and explained in this chapter to provide background information for the readers. Furthermore, this chapter explains the scope and the significance of the research.

Chapter 2 expands on the research methodology used, including the theories and concepts used by the research as references, tools or models to explain the main issues that will be analyzed further in the following chapters. Methods include the selected research areas, respondents, data collection and data analysis techniques. Chapter 3 gives an overview of tin mining history in Bangka Island and how the changing political conditions and the prevailing economic orientation for each regime. It begins with the general introduction of tin mining in Bangka Island. Next, this chapter will discuss the changes in political conditions bring about varying perspectives on mining and thus affect the formulation of economic policy the environmental safeguard placed on mining activities. Chapter 4 examines the factors that influenced local acceptance of suction dredging in a local coastal community in the Bangka Islands. Focusing on how this acceptance created a dilemma for the local fishers who were potentially impacted by this mining operation. Preliminary identification results local community of Tanjung Gunung has never agreed to suction dredger operation within village territory. Thus, the reason and process behind the social license agreement become the major focus of this study. It further offers an in-depth understanding of local people's views on how and when suction dredging operations should be approved, or not, and how these views shape local mining permit decision-making processes.

Table 1 Outline of Dissertation

	Theoretical	*Applied*
Literature and Database	***Chapter 1. Introduction*** Research Objectives, Research Scopes, Research Limitations and Significance of the Research	
Development of Theoretical Framework	***Chapter 2. Research Methods*** Theoretical and Analytical Approach; Research Framework; Study Area Overview; Data Collection Technique and Methods of Data Analysis ***Chapter 3. Historical Overview of Tin Mining and Its Development in Bangka Island*** The significance of Tin Mining; Tin Mining History across Regimes; The Overview of Suction Dredging	
Application and Validation		***Chapter 4. Case Study 1*** ***Local Political Dynamic of Coastal Resource Governance (Case Study 1)*** ***Chapter 5. Case Study 2*** ***Marginalization of Coastal Resource Dependent Community (Case Study 2)*** ***Chapter 6*** ***Adapting Livelihood towards Tin Mining: Options and Constraints***
	Chapter 7. The Synthesis ***Natural Resources for Local People`s Welfare: Governing the Coastal Tin resource***	

Chapter 5 explores how the local people issue social licenses for large-scale coastal tin mining in Bangka Island and how such decision-making impacts people's livelihoods and its implications for local decision-making on tin mining large-scale coastal suction dredging tin mining operations. First, this chapter describes local subsistence dynamics and the historical overviews on large-scale coastal suction dredging tin mining operations. Then later explores and exposes the perception of local people on the

benefits and impacts of large-scale coastal suction dredging tin mining operations and how it causes locals to shift their attitudes toward mining operations. Subsequently, this chapter investigates decision-making processes by describing how large-scale coastal suction dredging tin mining operation licenses are issued. Empathizing on how the roles and responsibilities of the actors involved and the distribution of compensation and royalties by the suction dredger company. Finally, this chapter will also provide several important points that should be considered to make fair and just decisions on tin mining and to ensure the information collated is not biased.

Chapters 6 sought to explore adaptation strategy of the coastal resource-dependent community by explaining the socio-ecological changes perceived by the local community before and after the spread of large-scale tin mining, and how it adapted to changes based on these perceptions. This chapter also provides recommendations for the policymakers to highlight the relevance of a focus on coastal tin mining in development efforts. Chapter 7 provides a synthesis between two cased explored in this study. This chapter will also provide a concise summary of the main arguments taken in the research and outlines the implications that these present for policy decisions as well as areas that are of interest for future research.

CHAPTER 2
RESEARCH METHODS

This chapter begins to unpick the theoretical and analytical framework employed within this research area. Also, it will provide information about the definition of key concepts prevalently used in the study. It's my focus being particularly towards the relation to the concepts and explanation of the reason why the concepts have been applied in the study. The research framework is presented to provide a clear linkage on each defining concept and to give clear dissertation outline. Next, this chapter will explain the process adopted for the selection of the study, villages representing two distinct ethnic communities and ecological systems. Following up, it will cover the reasons behind the selection of study areas, a description of techniques for data collection and an explanation of the analysis and finally, the last subchapter will discuss the limitations and challenges of the study.

2.1 Theoretical and Analytical Approach

2.1.1 Understanding Resource Governance, Vulnerability and Marginality through the Lens of Political Ecology

The discourse of Political Ecology emerged as a response to the escalating environmental problems in the Third World (Escobar, 2011). Sneddon *et.al*. (2005) proclaimed that the interaction between environmental problems and political forces in the unprecedented third world's development demands greater attention. Thus, significant interrelation between environmental problems and politics show the importance of an analytical approach that integrates both environmental and political perspectives (Zimmerrer and Bassett, 2003). As a response, in the 1980s, scholars from diverse academic and institutional backgrounds such as M. Watts (1983), P. Blaikie (1985), P. Blaikie and H. Brookfield (1987), T. Bassett 1988 and, N. Peluso 1992 began to examine the links between political influence and the emerging problems associated with environment by conducting assessment in parts of Asia, Africa, and Latin America. These scholars demonstrated their works through various studies of peasant production in Third World (Goldman *et.al*., 2011), correspondingly, a body of work that Bryant (1998) called as *Third-World of Political Ecology* emerged.

Exploring a wide range of tools and theoretical approaches in the critical study of human-environment relations, Robbins (2011) argued that political ecology has ascended to a prominent position in anthropological and geographical scholars. Political Ecology is considered as newly developing discipline, a growing body of related studies contributing to explore a variety of issues within the context of first or third world relations. The research focuses purely on the uneven effects of production, social reproduction, distribution, privatization, social justice and inequalities in harms and benefits particularly (Heynen et.al, 2006). Comparatively, she also acclaimed that it was vital to take notice that most of the studies have perpetuated the dichotomy within third worlds rather than providing

valuable insights into the roles of perceptions, values, and risk management institutions. Additionally, she pulled attention to her critic in which these studies have avoided scrutiny of the role of differential access to resources as emphasized by political ecologists (i.e., social vulnerability).

Regarding the above-mentioned critics, Robbins (2011) brought a significant contribution by emphasizing the importance of governance that undermines the development of political ecology through his studies. Governance, as defined by Young (1992) refers to the structures and processes by which societies share power, shapes individuals and collective actions. Young (1992), however elaborated that concept of governance is understood not the sole purview of the state through government, but rather emerges from the interactions of many actors including laws, regulations, discursive debates, negotiation, mediation, conflict resolution, elections, public consultations, protests, and other decision-making processes. Thus, from this perspective, governance can be formally institutionalized or expressed through sub norms of interaction or even more indirectly by influencing the agendas and shaping the contexts in which actors' contest decisions and determine access to resources.

There is a voluminous amount of literature on Natural resource governance. However, in this study I refer this terminology as the norms, institutions and processes that determines how power and responsibilities over natural resources are exercised, how decisions are taken, and how citizens, men indigenous peoples and local communities participate and benefit from the management of natural resources (Lockwood et.al., 2010; Pahl-Wostl, 2009; Adger et.al., 2003; Rogers and Hall, 2003; Leeach et.al., 1999). The effectiveness and equity of governance processes critically determines both the extent to which ecosystems contribute to human well-being and the long-term prospects for successful conservation of nature (Kofinas, and Chapin III, 2009; Turner and Daily, 2008)). Securing rights and sharing power and responsibilities through strengthening natural resource governance, including legal entitlements, benefits both people and biodiversity (Allison et.al., 2012; Borrini and Jaireth, 2007).

Governance, thus, is considered as a necessary foundation for both sustainability of the resource and the fair and equity utilization for all the resources users and decision making that promote democracy and local participation. Decision making over natural resource is defined as a processes by which groups who have a say decide and define, through a transparent and democratic process; what is and what is not acceptable in terms of natural use in a given area Furthermore they get to contribute towards how people comply with the agreed policies, rules, and regulations In addition, an important aspect of governance as opposed to government, and of multi-level governance in particular, is the participation of non-state actors in decision processes on the different levels of governance (Bäckstrand, 2006). Ribot (2002) testifies the dominant role of natural resources in local livelihoods, democratic local governance. Reinforcing how the citizens are required to have a voice and leverage in decisions over the natural resources they depend on.

In relation, the emergence of governance concept within resource management context, Bryant (1998) proposed that, the political ecology provided a strong analytical lens for people to explore the political dynamics that surrounded material as well as the discursive struggles over the environment in the third. This discourse highlights the unequal power relations that shape the politicized environment (Zimmerrer and Bassett, 2003), connecting the social-economic-political and ecological processes and dynamics (Rosenau, 1995). Similarly, other past scholars studied the resource governance-related studies during the mid-1990's and onwards, such as Cutter (1996, Peet and Watts (1996), Watts and Bohle (1998), Peluso and Watts (2001) whose works are concerning on the conflict over access to environmental resources. These scholar's main research area was to investigate how contestation over resources linked to the political and economic systems.

Comparatively, these scholars also explored the influence of resource politics and the risk contribution towards political instability and unequal governing processes. The research presented that the failed governance process was termed as bad governance and managed badly other scholars can have different interpretations. However, the 'bad governance' was best described as a situation where the relationship between the government, private sector, and the civil society was not in order. Meaning the government had failed to manage the resources (material and human) and the institutions of the nation for the optimum benefit of the generality of the populace. This was easily identified where the rule of law does not take its course; and where the socio-political atmosphere is not stimulating economic activities that would advance the country (Stoker, 1998). Similarly, Ogundiya (2010) through his findings summarized the major symptoms of bad governance as follows: a). Failure to make a clear separation between what is public and what is private; b). Failure to establish a predictable framework of law and government behavior conducive to development or arbitrariness in the application of rules and laws; c). Executive rules, regulations, licensing requirements and so forth, which impede the functioning of markets and encourage rent-seeking; d). Priorities inconsistent with development, resulting in a misallocation of resources; e). Excessively narrowly based or non-decision making.

In contrast Irvin and Stansbury (2004) undertook research in the opposite manner and considered the good governance. Their theory was purely focused on the good governance claiming it was about the processes for making and implementing decisions. It's not about making 'correct' decisions, but about the best possible process for making those decisions. Good decision-making processes, and therefore good governance, share several characteristics. All have a positive effect on various aspects of local government including consultation policies and practices, meeting procedures, service quality protocols, councilor and officer conduct, role clarification and good working relationships (Ansell and Gash, 2008). Smith (2007) emphasized on the main characteristics of good governance: a). Good governance is accountability in a fundamental requirement of good governance; b). Good governance is transparent, people should be able to follow and understand the decision-making process; c). Good governance follows the rule of law, this means that decisions were consistent with relevant legislation

or common law and are within the powers of council; d). Good governance is responsive, local government should always try to serve the needs of the entire community while balancing competing interests in a timely, appropriate and responsive manner; e). Good governance is equitable and inclusive, A community's wellbeing results from all its members feeling their interests have been considered by council in the decision-making process; f). Good governance is effective and efficient. Local government should implement decisions and follow processes that make the best use of the available people, resources and time to ensure the best possible results for their community.

Complementary to all this above Weiss (2007) research agreed with the theory of good governance. However, argued that good governance was participatory. Anyone can be affected by or interested in a decision and they should have the opportunity to participate in the process for making that decision. Ffor involving in this decision-making process, the communities need to be provided with information, have to ask for their opinion, given the opportunity to make recommendations or, in some cases, be part of the actual decision-making process (Renn et.al., 1993). Therefore, it is vital to understand that without 'active participants' good governance could be hard to measure or even take place.

Another study presented that the poor had less control of this decision-making process. Armitage (2006) highlighted how the imbalance control of access to resources in which Armitage (2006) called as the poor have fewer political and institutional controls over access to resources or ways of benefiting from them. Facing these imbalance control and access, Lowe (2000) through his study, it has been found that the most substantive ecosystem abuses are not organized locally, but rather underwritten by a ramifying bureaucracy and business community (Lowe 2000). This circumstance has been captured by a political ecology approach, therefore Forsyth (2004) suggested that to construct more meaningful and effective forms of explanation for environmental governance-related issues, scholars need to understand the complex social and political influences that inherently results from the dynamic changes in ecological processes.

Armitage (2006) and Lowe (2000), Berkes (2006) suggested that the dynamic processes can be best understood through a multilevel approach and interrelated among the level of society scopes. Consequently, Berkes (2006) suggested the only way to measure the accuracy of this research area was to look at the larger political economy, and how it reciprocally affects the dynamics of the local community practices. Since it is believed that, the international division of labor among rich and poor countries, and market forces within the poor underdeveloped capitalist economies of the Third World, cause the poorest of the poor to live in the most dangerous places (Beckford, 1999)he discrepancy between rich and poor will lead to underdevelopment process for which according to Collins (2010), it is intimately linked with the control and exploitation of indigenous resources by the governing elite and outside interests.

Undermining the process of under development occurring as the consequences of market forces and political system as explained by previous scholars, Ostrom et.al. (1999). It criticized the weakness

of political ecology approach which focuses only on explaining why a problem exists, but it does not deal with institutions and multilevel governance. In addition, Ostrom (1999) argue, even though political ecology provided strong tools of analysis examining "why things are how they are today" and "what are their determinant factors to show historical processes", the political ecology remained relatively weak when developing approaches towards problem-solving and under development. The process forces on the other hand, drove the poor into a more vulnerable position, which, in turn, directs them to look for another source of livelihood in areas where security may be lesser, and hazards are more severe or to change their resource use in ways that exacerbate vulnerability (Collins, 2010). Therefore, Peet and Watts (2004) suggested that political ecology need to be concerned with alternative strategies for development, and techniques of local adaptation and resistance which is a growing subject area within the literature.

However, from the above it is very evident that vulnerability played a big part. The relational term was best described by Collins (2010). He claimed that the poor where people who were affected by a combination of factors that influence the degree to which someone's life, livelihood, property, or assets are put at risk by the occurrence of a hazardous event. The vulnerability itself connected to three linked realms: root causes, dynamic pressures, and unsafe conditions (B. Wisner et al. 2004). The underlying causes of vulnerability refer to the wide historical, political, economic, demographic, and environmental factors that produce unequal distributions of resources among people. Dynamic pressures are processes and activities. For example, population changes, rapid urbanization, environmental degradation, global economic pressures, and political conflict. These processes translate the effects of root causes by creating unsafe conditions under which some people in each place and time must live.

The literature is addressing vulnerability-pertaining issue that has been concisely suggested that in analyzing vulnerability, forms of unsafe conditions must be considered in relation to the specific hazards facing people Wizner et.al. (2004). Thus, while unsafe conditions may involve both the spatial location and the characteristics of the built environment, they also include fragile livelihoods, resource dependency, inadequate incomes, legal and political inequities, and a lack of preparedness for emergencies (B. Bolin with L. Stanford 1998). Root causes, dynamic pressures, and unsafe conditions are all subject to change through time. Social vulnerability and security are relational attributes that articulate with these processes and change through time. Doner et.al. (2005) further stated that the vulnerability would lead to more marginalization.

The perspective of marginalization has remained influential in subsequent statements on the political ecology of risks, hazards, and disasters (Blaikie et.al., 2014), offers powerful lens for understanding the political ecology of risk, informing local and global understandings of human-environment relations (Collins, 2008). The concept of marginalization originally has been formulated by a spatial model that stresses relations between a dominant First World and subordinate Third World (Shah, 1996). Since the original theoretical expositions of marginalization, scholars have embraced

multi-scalar socio-spatial notions. While measurable differences in hazard vulnerability exist between rich and poor nations (Wisner et al. 2004), global models tend to obfuscate linkages with local processes, which are characterized by complex webs of human-environment interactions. Collins (2008) emphasized that patterns of development and underdevelopment may be relationally produced across a range of geographical scales (from global to local) in response to prevailing social inequalities and the dominant ideological and political economic imperatives of land use.

Based on early political ecology studies, it was postulated that the least powerful groups and classes in each society inhabit the most hazardous environments (Torry et al. 1979). This become evident through the findings from studies of spatial relationships between indicators of social marginality and environmental hazards, which contradict the critical hazards postulate that the least powerful people inhabit the most hazardous places (Kates and Haarman 1992; Beck 2009; Collins 2010; Lamond et.al. 2011). This offers a powerful lens for understanding the political ecology of risk, informing local and global understandings of human-environment relations.

There is a range of ways through which marginalization has been explained in social sciences theories. This thesis recognizes the importance of existing theoretical perspectives on marginalization which has been argued by Robbins (2011). Through his study he offers a powerful lens for understanding how the least powerful social groups are forced to become vulnerable to socio-environmental changes. Robbins (2011) defines marginalized people as the people who are politically and socially marginal (disempowered) and is pushed into ecologically marginal (vulnerable and unstable) positions. He further acclaims that economically marginal (dependent and narrowly adaptable) social positions, result in increased demands for the marginal (increasingly limited) productivity of ecosystems. Moreover, his argument covers the aspect social inequalities and how this pertains people from their livelihood options, leading them to degrade landscapes and occupy hazardous environments, constraining their abilities to cope with environmental changes.

One of the important highlights, within of political ecology and environmental justice studies follows; in the context of mining sectors revealing that the marginalization of poor minorities has been intimately connected to the distributions of positive and negative environmental externalities of the mining activity itself. The degree of impacts and how it will potentially exaggerate in the future will vary upon the locality context, type of mining activity and how the link between the governance system. Therefore, I adopted the perspective of political ecology to critically analyze the governance-pertaining issues within the context of tin mining social license issuance in the local level and how it potentially marginalizes the most affected locals into the more vulnerable.

In this study I adopt political ecology lenses to explore the governance system covering the structures and processes by which societies share power, shapes individuals and collective actions. of tin mining in the Island of Bangka. However, I realized that succeed of governing resource is influenced by the resource politics and the risk contribution towards political instability, this directly linked to the

patterns of differential risk that necessitates greater attention to cross-scale linkages. I further adopt the concept of marginalization undermined as one of the consequences of the governing system. I believe that the perspective of marginalization offers powerful lens for understanding how the success or failure of tin governance will potentially marginalize the affected locals.

2.1.2 Defining Concept of Social License, Local Participation in Resource Utilization, and Environmental Justice

Economic growth, rapid technological change, and the expansion of scientific knowledge have pushed societies to become more and more confident in their abilities to "manage" regional environmental change (Lebel et.al., 2006). A paradigm based on planning for efficiency, standardizing for easier social control, and reducing variability has come to pervade bureaucratically. Consequently, Hajer (1996) argued that environmental problems are further framed as technical and administrative challenges devoid of politics. This undermined the emerging of decentralization as an important instrument of environmental and development policy in the last two decades (Agrawal and Gupta, 2005), replacing the dominating top-down approach style governance**.**

Ferrazi and Rohdewohld (2017) best described the concept of 'Decentralisation'. They defined it as power and authority that is transferred from central government to actors and institutions at lower levels such as local or municipal governments, state/provincial governments or regional autonomous governments in a political-administrative and territorial hierarchy. This novel approach has placed governments in a position to play a role in decentralizing decision making and policy implementation to achieve diverse goals among them social development, democratic participation, resource management, and service provision (Ribot, 2002). At least sixty countries including Indonesia are decentralizing some aspects of natural resource governance for increasing the efficiency and equity development activities and service delivery, and for promoting local participation and democracy (Ribot, 2002). Decentralization will consequently affect the local people value, access, use, manage and voice of their claims and concerns about the natural resource (Ribot et.al., 2010).

However, Ribot (2003) discussed the practical aspects of decentralization. Affirming how the resistance emerged within central government body. Whereas, Gidden (2013) argued that decentralization should not be interpreted as downsizing or dismantling the central government, rather than the mutually supportive democratic relation between central and local governance. Huitema et.al. (2009) advocates the importance of collaborative approach among governmental institutions level in promoting decentralization as a way of increasing both efficiency and equity in natural resource management. Hence, democratization and natural resource management can be mutually reinforcing through decentralization (Larson and Ribot, 2004). Ribot (2004) stated that democratic decentralization (often also referred to as political decentralization or devolution) occurs when powers and resources are transferred to authorities' representative of and accountable to local populations, typically elected local governments. In the context of resource management, democratic decentralization aims to increase

public participation in local decision making of resource utilization.

Larson and Soto (2008) mentioned that literature on decentralization and natural resource management can be located at the intersection between discussions of good governance and democracy, development and poverty alleviation**.** Some of the social science scholars previously map the interrelation between concept of decentralization and natural resource management at the intersection between discussions of good governance and democracy (Lockwood et.al. (2010); Baumann (2000); Lane et.al. (2004), development and poverty alleviation (Blaikie (2006); Barrett et.al. (2005). On the other hand, Altieri (2002) and other studies of common property resources, community-based natural resource management, local rights show how precautions were put into place to access resources. In the context of the natural resource management framework, decentralization fundamentally refers to governance (Lockwood *et.al*., 2010). This idea reflects a principal underlying concern regarding who should make which decisions over natural resources and why? Who benefits from these shifts in rights and powers? as the formal and informal institutions through which authority and power are conceived and exercised and as the political-administrative, economic, and social organization and accountability of power and authority.

Alongside all this research it would be naïve to only demand on the governance outcomes and statistics. This is due to the governance outcomes being biased; they are rarely the result of simple processes. The results seem to be influenced by many contextual factors, environmental variables or even the actions or individuals or groups. Therefore, the findings are not always reliable. In the context of governing coastal ecosystem, the coastal-resource-dependent community faces immediate challenges towards their livelihoods, from environmental causes (such as declining resources and land-based sources of marine pollution) through to economic and social ones (such as limitations on access to marine resources, and changes in governance arrangements). Underlying are many challenges facing coastal communities lies, the unique realities of the land-sea interface, where terrestrial and marine issues intersect. On land, coastal communities face issues of land use conflict, watershed management, and environmental change. At sea, the fluidity of the ocean itself combined with jurisdictional complexities and the relative lack of property delineation produce their own difficulties. Finally, coastal communities are left to deal with issues arising where the land meets the sea, such as erosion, flooding, and pollution from agricultural run-off, and access issues including control over wharves that serve as key transportation links between land and sea. A fundamental aspect of the challenge to coastal can be found in the resources where certain communities demand on for their social, cultural, and economic well-being, from fish and minerals to coastal lands and beaches are subject to a mix of jurisdictions of municipal, provincial, and federal governments.

It is only accurate to state that many communities all around the world today have become more demanding towards their own involvement in decision making. As founded by Agrawal and Gibson (1999), communities wanted more of an involvement for resource utilization available in their

geographical area (Agrawal and Gibson, 1999). Now, being in the 21st century, there is even more demand in community involvement, wanting their voices to be heard. Alongside, a large body of studies has been undertaken in the natural resource management part. (Agrawal and Gibson, 1999; Berkes, 2004; Blaikie, 2006; Conley and Moote, 2003); Cox et.al., 2010; Pimbert and Pretty, 1997; Tompkins and Adger, 2004) and valuable work has been conducted in community engagement in the context of large-scale mining activity (Hamann, 2004; Kemp and Owen, 2013; Rolfe et.al., 2007; Sosa and Keenan, 2001). However, there has been limited analytical and theoretical studies focusing on the importance of obtaining community approval to support the sustainability of mining activity itself therefore, it becomes hard to compare all data collated. Whereas, On the other hand, the global trend shows the undergoing notable shifts within resource governance demanded the extractive sector to improve their environmental and social performance.

In addition, due to the concept's relatively recent emergence only a limited body of scholarship has been found and researched. It is a relatively unregulated arena of company–communities interactions that the discourse of social license has occupied, due to local communities sensitivity towards 'governance actors' affected by mining operations (Prno and Slocombe, 2012).The growing concern among communities, government and other stakeholders regarding the adverse social and environmental impacts of corporate activity have proven that full legal compliance with state environmental regulations become an increasingly insufficient means of satisfying society's expectations with regards to mining issues (Owen and Kemp, 2013); Prno and Slocombe, 2012). Consequently, Prno and Slocombe (2012) argued that; protest, demonstration, blockades, non-issuance or retraction of government permits, media, and shareholder campaigns, potentially slows or shuts down the mining operations. Drawing upon insights from the extractive industries related studies, a burgeoning body of research has suggested the importance of revising resource extraction policies and improving governance of the mining industry. As stated by Prno and Slocombe (2012) that conventional approaches to mineral development no longer suffice for these communities, which has demanded a greater share of benefits and increased involvement in decision-making.

A heterogeneous array of advocacies highlighted by some past studies (Ballard, 2001; Aspinall, 2001, O`Faircheallaigh and Ali, 2008) also addressed why government authorities in Indonesia should take more action upon the local community benefits. There should be more provided towards mineral wealth in more sustainable aspects. Likewise, the adverse impacts of company activity have witnessed growing concern among communities, governments, and other stakeholders in recent decades (Donaldson and Preston, 1995). This further implies the necessity of mining companies to gain the local community approval on mining operations. These trends have been spurred by the growth of the sustainable development paradigm, increasingly transferred governing authority towards non-state actors. As well as escalating the importance of the voices of affected communities to become much more influential in mineral development decision-making and political processes (Ratner, 2003).

Burchell and Cook (2006), stated how social license emerged from the discourse of corporate responsibility. Furthermore, O'Mahony and Ferraro, (2007) often conceived of as a single license granted by a 'community'. In addition, to the concept of the social license, it has emerged in partly because of society's recent embrace of the sustainable development paradigm (Prno and Slocombe, 2012). Gunningham et al. (2004) suggested that the social license was almost like a set of laws, it was a set of demands and expectations that had to be followed. These were put into place by local stakeholders and broader civil society, reinforcing the way they felt businesses should have operated. Salzmann et al. (2006), meanwhile, wrote about the likelihood of companies that held social licenses. He claimed that companies holding the license would depend on the degree of the match between stakeholders' expectations and the company's actual behavior. This focus on expectations resonates with Harvey's (2011) view of social license as a process of "fitting in and adapting to the prevailing social norms".

Parsons et.al. (2014) has observed that literature on the social license is sparse, but encapsulates a diversity of notions such as demands and expectations, legitimacy, credibility, and trust, and free, prior and informed consent. Regardless, numerous studies focuson social permits and have previously conducted to share several common characteristics of social permit including: (a) a social permit is intangible and unwritten (Franks et al., 2013); (b) difficult if not impossible to measure (Parsons and Lacey, 2012); (c) a highly normative concept and not all mining contexts are necessarily amenable to its issuance (Prno and Slocombe, 2012); (d) time specific which means, it has to be continually renewed because it is variable across time and amongst stakeholder groups, and it will change in response to different issues (Parsons et.al.; 2014); (e) context-specific and thus reflective of local social, economic, and environmental conditions; community priorities, capacities, and expectations will vary depending on the setting (Prno and Slocombe, 2012).

However, according to Prno (2013) benefit sharing is the key element of social permit issuance. Prno (2013) also emphasized that for communities to accept mining on their doorstep, they need evidence to prove how much tin mining benefits society and what actions would be put into place to compensate for losses or other negative impacts. Furthermore, Davis and Franks (2014) emphasized that equitable sharing of benefits within communities was necessary because according to Kemp et.al. (2011) the inequitable distribution of risks, impacts, and benefits remain key drivers of community conflict at mining operations. Regardless, of the challenges and opportunities within benefit distribution context, it is apparent to avoid the potential conflict, a mining company must develop community relations management strategies that are reflective of local circumstances (Bond, 2014). Thus, community relations, generally, should be conceptualized as a practice that involves working for the company to understand local perspectives, bridging communities and company perspectives to generate dialogue and mutual understanding, and facilitating changes to improve social performance (Kemp, 2010).

The public participation and local empowerment that play a massive part in decision making is known as the central tenets of the sustainable development approaches (Prno and Slocombe, 2012). The amount of public participation in decision-exploring processes through to implementation, monitoring, and sanctioning varies from the provision of information by authorities to various levels of consultation, collaboration, and empowerment (Lebel et.al., 2006). Public participation often broadens the range of interests and issues that need to be considered, because different stakeholders assign different values to different ecosystem services and risks (Natural Resource Council, 2008).

Public participation consists of three distinct forms: participation in decision making, access to information, and access to justice (Pring and Noe, 2002; Renn et.al., 1995). Public participation is now generally agreed to contribute to the improved substance, process, and acceptability of decision-making. This is primarily because it provides opportunities for the public to be informed about a project and for their issues to be identified and addressed. They public would then be able to have a say and have their voices heard amongst the communities. Local participation and community engagement in mineral development projects can occur in many forms (cf. Bowen et al., 2010); the key is to determine which mechanisms are the most appropriate for particular stakeholder groups.

On the other hand, some social-permit-oriented research has been conducted by some scholars concerning the theoretical background, the history of emergence, the procedural and mechanism, however, there are still several areas in need of further exploration and analysis. In this work, there remains a need to determine how these guiding principles can best be operationalized in the context differing social, political and economic realities at different mine sites around the world. This form of research would have such an important role and have implications towards the sustainable development of global mineral resources and could help to lead to more desirable mining-community outcomes. Likewise, there are numerous governance-oriented issues that can emerge to affect social permit outcomes and that should be considered by practitioners and analysts. Along with the importance of good mining-community relations become ever-more apparent, the results of these types of assessments will only become more valuable.

In order to help mining companies and related government institutes, it is vital to follow the guides providing by the principles. Following these guiding principles would greatly help communities to overcome the complex and changing circumstances that are often characterize mineral development contexts. For the affected communities, fair deliberation on issuing mining social permit will lead to positive partnership that provides options for power-sharing (e.g. through co-management or joint decision-making committees) and local ownership (e.g. through share offerings, equity positions, and revenue sharing) are some of the more progressive partnership opportunities that could be explored.

In regard to the above-mentioned explanation, the concept of environmental justice provided powerful less to explore how the environmental decision-making over resources is often characterized by a class of goals and values about what interest should be supported (Schloesberg, 2009). Justice is

central to cases of land use conflict concerning resource extraction and development. Justice is a multifaceted concept and it has different meanings for different people (Kennedy, 2017) and is situated and contextual, grounded in circumstances of time and place (Walker, 2012). Therefore, it is important to consider the concern of justice within decision making to minimize the potential disputes emergence.

Kennedy (2017) found that conflicts over extractive development reveals a confluence of interests and concerns which extend beyond the substantives outcomes of disputes. These included whether communities and individuals are impacted by resource extraction have meaningful opportunities in participating in decision making, how they are treated in decision-making processes, and ultimately whether decision makers adequately account for impacts upon community well-being, a way of life. Hence, governance interventions that misjudge or overlook these concerns are destined to fail, inevitably leading to conflict.

It is important to underline that the impacts of extractive activity may be disproportionately felt by the affected locals thus, on remedying unjust distribution essentially becomes a question of scale: at what level, whether local, regional, state, national, should the benefit and burdens of resource extraction be measured. "Environmental justice is more than just a fair distribution". It is also concerned with how that distribution is shaped by procedural fairness and parity in opportunities for participation in environmental decision making (procedural justice); the respect and recognition of various parties (recognition); and the capabilities of individuals and communities to function and flourish (capabilities).

In this study I adopt the concept of social license to operate to. I further adopt the concept of environmental justice to provide powerful less to explore how the environmental decision-making over resources. I consider justice is central within democracy framework in issuance of tin mining social license to operate. I bring this assumption along with the concept of environmental justice posted by Walker (2012) that this concept is extended behind geographic distribution of environmental risk and harm to explore the real impact upon individuals and communities. Environmental justice I refer as something more holistically on the importance of individuals functioning within a base of minimal distribution of goods, social and political recognition, political participation and other capabilities. It offers broad and inclusive definition of justice because not only distribution of goods but also how those goods are transformed into capacity for individual to flourish. Hence, this will enable a deeper understanding of actor's freedom and agency and why conflict takes a particular path which may provide useful on resolving the conflicts or providing an ethical basis for future policy interventions (Kennedy, 2017).

Kennedy (2017) has listed three main causes of environmental injustice: a). racial discrimination, b). economic explanations, and c). socio-political explanations. Environmental racism is a form of institutionalized discrimination that operates through unequal power arrangements where particular ethnic or racial groups are political and or numerical minority. Economic Explanations demonstrate environmental injustices resulting from paradigm decisions and actions primarily within contemporary

capitalism (Kennedy 2017, Walker, 2012). This refers to the way assumption about the benefits of the market system influence societies' perception of the environment as separate from humans and the market. in this case, the environment is commoditized: “it has value only as environmental good, services and amenities that can be bought, sold, traded, saved or invested like any other commodity (Leeach et. al, 1999). Thus Kennedy (2017) elaborated that private actors make decisions in the market system to maximize their utility which leads to optimal social outcomes for the environment, assuming that the environment has a price or value in the market system. However, many aspects of the environment are not priced in market systems, including ecological services and environmental impacts such as environmental degradation and pollution.

The socio-political explanation includes analyses of politics, power, and culture that are the central to each of these explanatory frameworks is the unequal distribution of power. Power may be structural (referring to political and economic frameworks), material (object-based) or discursive (language-based) and operates to exclude certain interest from decision-making processes (Kennedy, 2017; Walker, 2012). Power can work directly to limit participation in this way and to limit the scope of the political process to non-controversial misses or to exclude certain participants. The second dimension focuses on ‘non-decision making’ under which the demand for changes is silenced before they are voiced, through shaping of values and institutions. To sum up, concept of environmental justice provides, a mechanism for investigating these complex issue, helping us to comprehend why conflicts become resistant to legal and policy interventions and how they could be differently managed (Beierle et.al., 1002). The environmental justice concept opens up a dialogue about alternative approaches to environmental decision making that can result in outcomes that are better informed and fair (Beierle, 1998).

2.1.3 Conceptualizing Adaptation Strategy and Socio-Ecological Changes

Political ecology needs to be concerned with alternative strategies for development, and techniques of local adaptation and resistance. Thus, following the previous subchapters I adopt the concept of adaptation strategy to identify how the marginalize local adapt toward the socio-ecological changes as the impacts of massive coastal tin mining exploration.

To begin, a very prominent article by Wijkman and Rockström (2012) provided crucial information. The information acclaimed that: although earth has undergone many periods of significant environmental change, the planet’s environment has been unusually stable for the past 10,000 years Wijkman, A., & Rockström, J. (2012). Rockström et.al. (2009) highlighted that this period of stability known to geologists as the Holocene has seen human civilizations arise, develop and thrive. Such stability may now be under threat. Since Industrial Revolution, a new era of Anthropocene arisen, in which human actions become the main driver of global environmental change (Steffen et.al., 2011).

Lui et. al. (2007) suggested that over the past decades there has been a great link between the human systems and the natural systems. However, the link has been the drastic negative impacts caused

by the influence of multiple anthropogenic stressors. One major population that was impacted highly was the communities that directly depend on nothing else but the natural systems for their livelihoods. As a result, communities that was directly dependent on the natural system had to adapt to the negative changing circumstances to strive (Armah et.al, 2010). Drawing from the above-explained perspectives, social-ecological systems change over time affecting the human lives (Adger, 2006). How social-ecological systems are always changing and also brought another central theme to a vulnerability and marginalization because as argued by Adger (2003) that the impacts of social-ecological changes will be felt particularly by resource-dependent communities through a multitude of primary and secondary effects cascading through natural and social systems. Berkes and Ross (2013) define "social-ecological system as an integrated complex system that includes social (human) and ecological (biophysical) system in a two-way feedback relationship". He further emphasizes that social-ecological systems are complex, exhibiting different levels of linkages at different levels of a scale. Therefore, to understand the ecosystem, we should not ignore the human component that also contributes to shape the nature and in turn shaped by nature (Folke, 2006).

Within the context of my study, I consider that the government regimes shift along with the changing of the legal framework that affects the governance system generating implications for socio-ecological changes in Bangka Island. Using this perspective, I would like to draw a closer understanding toward general concepts of the social ecological changes, furthermore, I would like to explain and adopt the adaptation strategies that help explore the changes towards the local communities. Within the context of coastal mining exploration, the long historical trajectory of coastal and land mining activity both large and small scale is believed to have strong influences upon the dynamic of local livelihoods. Therefore, I use the concept of adaptation strategy to see the variety of strategies adopted by affected locals and the factors influencing their decision to adopt or not to adopt.

The concept of adaptation is not new; it has been broadly used when adaptations have been put into place to protect the living organicist's during the ongoing changes. The use of the term 'adaptation' in a scientific context originates in the literature on evolutionary biology and Darwin's concept of natural selection (Wagner and Altenberg, 1996). It has entered in the larger interdisciplinary field of global environmental change, changing more in the direction of a concept used by researchers and others to guide policymaking with the aim of securing sustainable and equitable development in the light of a changing climate.

Some scholars have emphasized on the idea that there is a change in social-ecological system adaptation becomes an integral part of the system to maintain the system (Walker et.al., 2002; Adger, 2003; Folke,2006; Pahl-Wostl, 2007). Going ahead with perspective, it is important to understand the dynamic changes within the socio ecological society and accept that when changes occur adaptations need to be put into place. (Davoudi et.al., 2012). Anderies et.al. (2013) argued that adaptability is a part of resilience, representing the capacity to adjust in responses to changing external drivers and internal

processes and thereby allow for development along the current trajectory. An increasing body of literature is currently demonstrating the importance of understanding how social and ecological systems are linked to build both social and ecological resilience (Davidson-Hunt and Berkes, 2003).

Smit and Wandel (2006) mentioned that the concept of adaptation, adaptive capacity, vulnerability, resilience, exposure, and sensitivity are interrelated and have wide application to global change science. The concept of Resilience was originally introduced by Holling (1973). It was a concept that was put into practice to help communities understand the capacity of the ecosystems with alternative attractors to persist in the original state subject to perturbations, as reviewed by e.g. Gunderson (2000), Folke (2006) and Scheffer (2009). In some fields, the term resilience has been technically used in a narrow sense to refer to the return rate to equilibrium upon a perturbation (called engineering resilience by Holling in 1996). However, many complex systems have multiple attractors. Another resilience-related study conducted by Adger et.al (2005) found that resilient social-ecological systems incorporated diverse mechanisms to help for coping with changes and the continuous crisis's taking place.

In the budding literature on adaptation, a small number of studies, previous scholars have been conducting adaptation-strategy-related researchers from a different type of perspectives. One study done by Stringer et.al. (2009), defines adaptation as a process of deliberate change, often in response to multiple pressure and changes that affect people's lives. Similarly, another study by Smit and Wandel (2006) define adaptation in the context of human dimensions of global change usually refers to a process, action or outcome in a system (household, community, group, sector, region, country) for the system to better cope with, manage or adjust to some change. Hence, when there is a social, economic or ecological change, people take actions either long or short-term to adapt in order to stay resilient.

Based on the findings of climate change, it can be argued that certain evidences collated demonstrate how traditional societies have been made to adapt in many senses depend on experience, knowledge, and dependency on weather-sensitive resources. The capacity to adapt is a critical element of the process of adaptation. it is the vector of resources that represent the asset base from which adaptation actions can be made. There are many apparent paradoxes at the heart of debates on adaptation to climate change, yet few adaptation-related studies have been conducted in the context of the impact on extractive industries and activity.

There are two main types of adaptation according to Adger et al. (2005): a). first, an unintentional adaptation which takes place without any strategies; b). second, the purposeful adaptation. Adger et.al. (2005) elaborated that unintentional adaptation helps in the delay of purposeful adaptation by reducing the change in the system. Whilst discussing fishing, looking into this context and how, unintentional adaptation may take place; it could be that the fishermen goes fishing for a longer period of time which then causes changes in the regular fishing techniques Both purposeful and unintentional adaptation has short-term and long-term benefits. Adaptation decisions are taken by individuals (e.g., to use insurance, relocation away from threats, or changing technologies) and taken place within an institutional context

that can act to facilitate or constrain adaptation.

However, it is profoundly found that not all successful adaptation strategies used by a community will produce similar results when used by another community. However, adaptation strategies may increase the vulnerability of a community instead of helping them to deal with ongoing change processes, which are referred to as mal-adaptation (Barnett et.al., 2013; Magnan et.al., 2016; Scheraga & Grambsch, 1998). As a result of mal-adaptation, communities become more vulnerable to changes in the social-ecological system. Thus, the type of strategy that a community is using to adapt to changes in the social-ecological system is important because of the possibilities of mal-adaptation that can make the system more vulnerable to changes. If the adaptation strategy is maladaptive, the social-ecological system of the community will become vulnerable and even a slight change will have impact on the system profoundly. In this research, I have focused on the adaptation strategies used by the fisher community and analyzed what worked and what did not thereby lead to mal-adaptation

As a result, when the system moves to a new state and is unlikely to return to its previous state, communities respond by adapting to the changes (Nelson et al., 2007; R. I. Perry et al., 2011). Strategies that are put into practice to adapt and cope with changes can come from various ideas such as; the household, community, group, sector, region and country (Smit & Wandel, 2006; Smit et al., 2000). Grafton (2010) defines social adaptation in the context of fisher community "social adaptation is how communities and networks of fishers and stakeholders collaborate to respond to change". He also explained the importance of social adaptation: 1. it integrates and brings together different knowledge sets and experience; 2. sharing of risk across stakeholders; 3. helps in the collective decision-making.

It would be accurate to suggest that any form of successful adaptation could lead to forms of resilience. The term `resilience` originated in the 1970s in the field of ecology from the research of C.S. Holling (1973) who defined resilience as a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationship between populations or state variables. Similarly, Walker and Salt (2006), Ability of a system to absorb disturbances and still retain its basic function and structure. Carpenter et.al (2001) further discussed three points describing social-ecological resilience, including: a). amount of disturbance a system can absorb and remain within the same state; b). the degree to which the system is capable of self-organization; and c). the ability to build and increase the capacity for learning and adaptation.

2.2 Research Framework

In this study, I have aimed to define the natural resource governance and I believe this is known as the norm, where institutions process how power and responsibilities over natural resources are exercised. Furthermore, how decisions were taken step by step and how the local communities contributed to the final decision-making process. I considered how the effectiveness and equity of governance processes critically determine how ecosystems contribute to human well-being and the sustainability of the available resource.

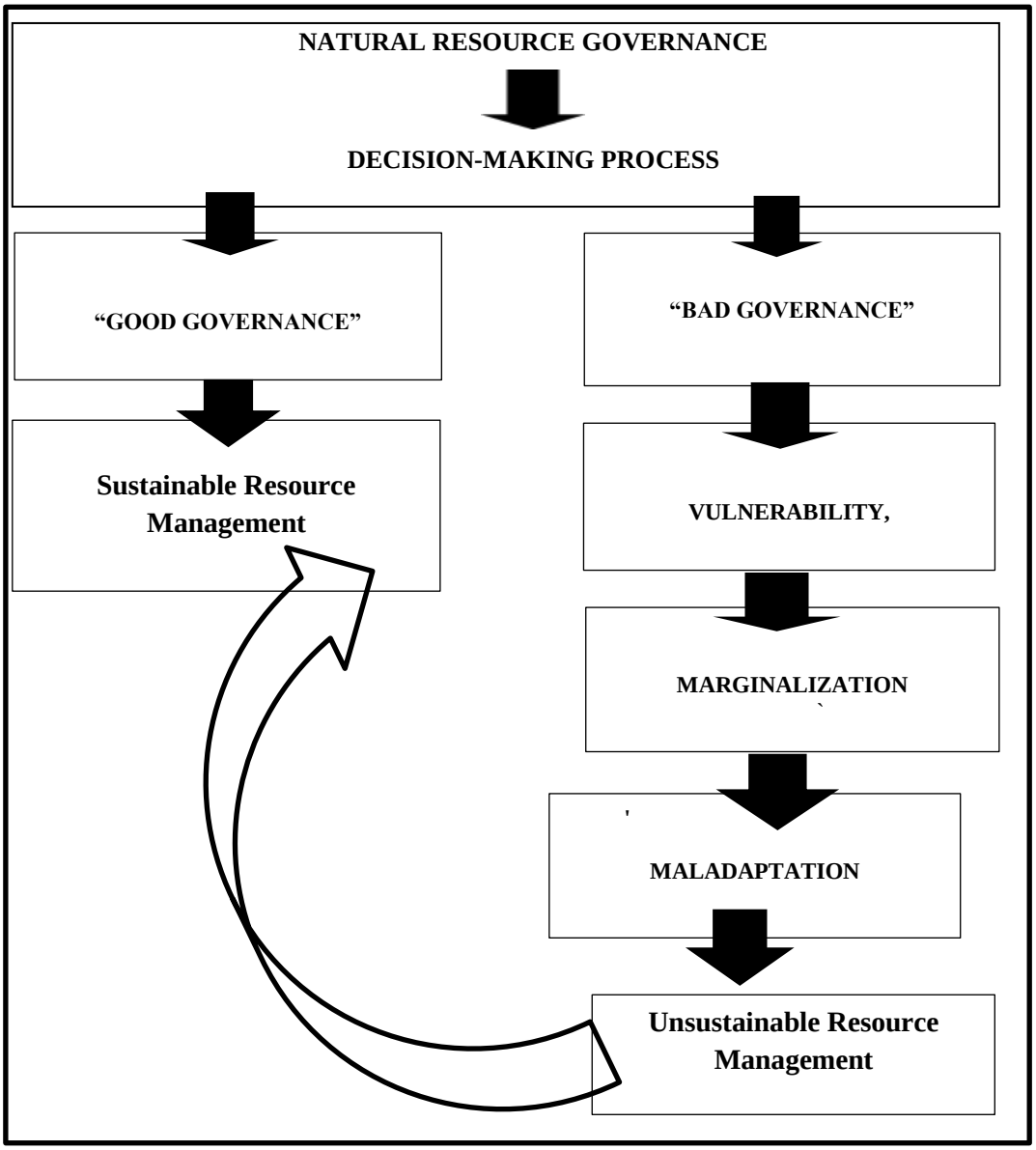

Figure 1. Analytical Framework

However, securing rights and sharing power and responsibilities through strengthened natural resource governance, including legal entitlements, benefits both people and biodiversity is highly challenging, because both social and environmental benefits and cost should be fairly considered. From this perspective, I consider that to ensure the effective long-term sustainable management of natural resources requires the representative and democratic governance system.

According to the background information, it`s apparent that governance is a necessary foundation for both resource sustainability, fair and equity utilization. It is due to all the resources that are being used and the decision-makings taking place. These all promote the democracy and local-participation. Decision-making in natural resource context refers as process by which groups of rights holders decide and define, what is and what is not acceptable in terms of natural use in each area, and how to ensure

that people comply with the agreed policies, rules, and regulations through a transparent and democratic process that represents the interests of related stakeholders.

From this perspective, I drew an important point that decision taken from this process will determine who have the access and right who do not have the access and right to utilize the resources, as well as who have the control or who do not have control over the resources. Thus, deciding the right to control and the right to access over resources fairly and equally is perceived as central tenants of resource governance. Nevertheless, decision-making requires a process to reconcile multiple actors; therefore, all decisions should be taken by considering all the interests, considering four important aspects, including economic efficiency, environmental effectiveness, equity, and political legitimacy. As an implication, if decision making successfully create democratic space that accommodate all the people voices fairly and equally, good governance which is accountable, transparent, follows the rule, responsible, equitable and inclusive, effective, efficient, equitable and inclusive will be achieved.

Based on the finding of failed democratization, it can be argued that it leads to bad governance. This is the situation where relationships between the government and the private sector is demolished, where the civil society no longer are in order, enabling failure in managing resources to occur (material and human resources) and the institutions of the nation to benefit from the general popularity. It is where the rule of law does not take its course; a state where the socio-political atmosphere is not stimulating economic activities that would advance the country. Since the dominant role of natural resource utilization is in local livelihood, democratic local governance requires that people have a voice and leverage in decisions over the natural resources they depend on. Bad governance will consequently drive them into vulnerable state that potentially marginalized them.

Coastal resources in Bangka Island are utilized by various users who have interest such as, fisheries resource users, mining resource users and other interest derived users. Thus, to ensure its sustainable utilization, good resource governance that considers both mining actors and fishery actors interest fairly and equally involved. In this study, I focus on decision-making of social permit for mining exploration by suction dredger. It would be accurate to say that I consider the participation of non-state actors within the in-decision process to be affected by the local community, on social permit of coastal mining activity is fundamental. Their participation in decision-making is generally agreed to contribute to the improved substance, process, and acceptability of decision-making. Furthermore, I consider that community-level decision making is a political process. This is why I see urge to clarify the process of issuing permits. This is ordering to see whose views and knowledge need to be heard, or whose attitudes and beliefs should be enhanced finally I can observe what will be the implications. Both cases, in Tanjung Gunung and Selindung provide interesting cases to describe how local political dynamic and complexity in mining social permit local decision making brought diverse consequences to the affected locals.

It is important to note that the sustainability of regional development can be usefully explored through several different lenses. In situations in which uncertainties and change are the key features of

the ecological landscape and social organization, critical factors for sustainability are resilience, the capacity to cope and adapt, and the conservation of sources of innovation and renewal. However, interventions in social-ecological systems with the aim of altering resilience immediately confront issues of governance. One of the important perceived drawbacks of the existence of mining operations is the social-ecological systems gradually changing, of coastal and land mining activity both large and small scale is believed to have strong influences upon the dynamic of local livelihoods. Therefore, I use the concept of adaptation strategy to see the variety of strategies adopted by affected locals and the factors influencing their decision to adopt.

However, it is important to emphasize that not all adaptation strategies is successfully adopted. The successful adaptations will lead into resilience state, in which systems will absorb to change and disturbance. The failed adaptation will consequently lead to mal-adaptation, in which adaptation strategy they applied will drive them into more vulnerable and marginalized state, instead of helping them to deal with ongoing change processes and leading to resilience. In addition, options and constraints of the available livelihood options will affect the adaptation strategy they deployed. About this view, I adopted the following concepts to explore the adaptation strategy of the coastal resource-dependent community perceived by the local community before and after the spread of large-scale tin mining, and how it adapted to changes based on these perceptions.

Figure 2. Research Framework

In conclusion for the following, it is noted that the general framework provides a conceptual logic employed within this research area. The overall goal of this study is aimed to explore the mining governance in the context of social permit decision-making at the local level from two different research sites with the different contextual background. I further analyzed how the existing decision-making process potentially marginalized the affected local. As a response, this study also explored the affected

local adaptations techniques deployed towards on-going socio-ecological changes as the impact of tin mining activity. Drawing from the case study findings, I provide synthesis that examine the existing resource governances applied and explore its implication towards coastal community`s livelihood. From this standpoint, it enables me to identify what are the problems occurring and the potential point improvements that can be developed to achieve good tin mining governance.

2.3 Description of Study Area

2.3.1 The General Introduction of Bangka Island

Bangka Island, known as *Pulau Timah* is the largest tin-producing region in Indonesia (Kurniawan, 2005), parts of the "The South-east Asian tin belt" region that is spread over from the mainland of Thailand, Malaysia, and Riau Islands to Bangka and Belitung island (Schwartz, 1990). Province of Bangka Belitung Islands designated as the 31st by the Government of the Republic of Indonesia under Law No. 27 Year 2000 on the Establishment of Bangka Belitung province which was part of South Sumatra Province (Hayati, 2011). The provincial capital is Pangkalpinang. This province is located at 104 ° 50 'to 109 ° 30' east longitude and 0 ° 50 'to 4 ° 10' south latitude, with boundaries as follows: On the west by the *Strait of Bangka*; East of the *Strait Karimata*; in the North, the *Natuna Sea*; and in the south of the *Java Sea* (Statistik Daerah Kepulauan Bangka Belitung, 2017).

The natural features of this province are mostly dominated by lowlands, valleys, mountains, and hills. The land in Bangka Belitung generally has a low average of pH (below five), but it has high aluminum, tin, quartz, granite, kaolin, and clay (BPSb, 2017). Having a total area of 81,582 km2, comprising a land area of 16,281 km2 and marine waters of 65,301 km2 (four-times the area of land area), is inhibited by 1.401.827 persons, Bangka-Belitung Island Province has larger sea territory than its land territory (BPSb, 2017). 79.90 percent of the total area is territorial water that is part of Shoal Sunda (Sunda Shelf), Belongs to archipelagoes province, Bangka Belitung island province has very strong attachment and dependency with its coastal and marine ecosystem. Mainly lowland below 50 m; its climatic differences within the island are small. Its climate belongs to the Af-type Koppen-Geiger climate classification, with an average temperature of 26.3oC, average humidity of 61.7% and average annual rainfall of approximately 2,400 mm (Statistik Daerah Kepulauan Bangka Belitung, 2017).

The Province of Bangka Belitung Island is a cluster of two islands, *Bangka* and *Belitung*. Surrounded by small islands, such as *Nangka, Penyu, Burung, Lepar, Pongok, Gelasa, Panjang, Tujuh, Lungkuas, Pelanduk, Seliu, Nadu, Mendanau*, etc (Kemendagri, 2016). This province is administratively divided into 6 districts and 1 city, namely Bangka (2950.68 km2), West Bangka (2820.61 km2), Central Bangka (2155.77 km2), South Bangka (3607, 08 km2), Belitung (2293.69 km2), East Belitung (2506.91 km2), and Pangkalpinang (89.40 km2). To streamline and facilitate the administration of each district/city is administratively divided into sub-districts, villages, and villages (Statistik Daerah Kepulauan Bangka Belitung, 2017).

In term of population at national level, Bangka Belitung Islands is a small province. The latest

population census shows that the total population of the province in 2010 was about 1.2 million (Indonesia: 237.6 million), with 108 males per 100 female population. The projected population in 2014 is about 1.3 million, very closes to the total population of Trinidad and Tobago or Bahrain. In terms of age-structure, Bangka Belitung population can be categorized as "young" as the proportion of young population (aged below 15) in 2010 was more than 34 %, while those of aged population (aged 65+) was less than 4%. Almost 80% of Babel populations are usual residence of Bangka Island. They are distributed in five districts within the island: Bangka (22.7%), Bangka Tengah (13.2%), Bangka Barat (14.3%), Bangka Selatan (14.1%) and Pangkal Pinang (14.3%) (Statistik Daerah KBB, 2017).

Residents of the Islands of Bangka and Belitung originally belong to the sailor ancestry descendants who historically inhabit through acculturation processes. These sailor ancestry groups came from the different island, sailed through *Indian and Pacific Oceans* and spread inhabitation throughout the *Malacca* beaches. They further settled in surrounding the peninsula and island in the Riau area. These sailor ancestries from *Borneo* (Kalimantan) and *Celebes* (Sulawesi) were assimilating each other, but due to the strong waves and bad seasonal conditions, they shifted and finally occupied the island of Bangka and Belitung. Another sailor ancestry group came from southeast Celebes was further came and settled throughout Bangka, Belitung, and Riau Island. *Butonese* is well known as their strong ancestry background and their capability in constructing good sailing ships (Heidhues, 1992).

In addition to these, ancestry groups, people from the Malay area, such as *Johor*, *Siantan the Malay*, *Malay-Chinese Mix*, and even *a native of China*, also came and mingled the existed residents through the process of acculturation. People from *Minangkabau*/West Sumatra, *Javanese*, *Banjar*, *Bawean Island, Aceh* and some other migrant tribes also migrated to Bangka Belitung Island. These mixed-cultural inhabitants were further labeled as *The Malay* or locally called *Bangka-Belitung People* (Erman, 2010). The most dominant language used in Bangka Belitung Island is *Melayu* which is also referred to as a regional language, but due to the diversity of ethnic groups, other languages like *Chinese* and *Javanese* are also used. Hence, Bangka Belitung island province is inhabited by multiethnic groups with diverse socio-cultural backgrounds (Heidhues, 1996).

There are some philosophies believed by locals regarding the origins of Bangka Belitung Island. Some people believed that, Bangka and Belitung were originally formed when a ship sinking, broke in two; the mast became the mountains. Another explanation says settlers who landed on Bangka found the corpse (*bangkai*) of previous inhabitants who had died of starvation, indicating how little the island could offer. However, these islands were historically under the control of Sriwijaya and Majapahit Kingdom, even after colonization era. After the capitulation of the Netherlands, Bangka Belitung Islands became a British colony as the Duke of Island. On May 20, 1812, the British rule ended, after the convention of London August 13, 1824, and power shifting occurred. Bangka Belitung Island colony is between Municipality Court (England) and K. Hayes (Netherlands) in Mentok on December 10, 1816 (Heidhues, 1996). In the era of Japan colonialization residency, Bangka Belitung Islands were

commanded by the Japanese Military Government (Heidhues, 1992).

After the proclamation of independence of the Republic of Indonesia, the Netherlands in the form of the Board of Bangka, under Law No. 27 of 2000 the city of Pangkalpinang, Bangka and Belitung became Bangka Belitung Province (Husnial, 1983). Furthermore, identified since January 27, 2003, Island-Bangka Belitung province experienced regional expansion by adding four new districts, namely West-Bangka, Bangka-Induk, Central-Bangka, South-Bangka, Pangkalpinang, Belitung, and Belitung-Timur (Ibrahim, 2016).

Tin commodities become the largest overseas exports of Bangka Belitung Island province, contributing 75 percent from the total export balance in 2014 (Eng., 2014). Therefore, up until now, the tin mining sectors remain to dominate within the economic activity in this province. However, the adoption of a moratorium that obliges shutting mining activity in 2011 has, in fact, caused a decline in tin production (Hamidi, 2015). Nevertheless, by 2015, tin mining sector has begun to show a significant increase of 200 percent to 55.548 Ton Sn. Although not as fast as production growth rate, tin mining activity still showed growth in 2016 with an increase of 2.44 percent and production quantity 56.906 Ton/Sn (Statistik Daerah Kepulauan Bangka Belitung, 2017).

As a province that has maritime and Islands areas, Bangka Belitung has had a strategic role to become the prime mover of the regional economy. Bangka Belitung Islands provinces is a maritime and Islands area which has a lot of coastal areas and islands as much as 950, 470 islands have been named and the rest still unnamed (Propinsi Kepulauan Bangka Belitung Dalam Angka 2017). Bangka Belitung Islands Province has a coastline of 1,295.83 Km with an estimated twenty-percent of it is coral waters, which is a good ecosystem for tropical water fish habitat. Therefore, Bangka Belitung Islands have an abundant marine and fishery resources both in terms of quantity and diversity (Propinsi Kepulauan Bangka Belitung Dalam Angka 2017, 2017).

In 2014, the realization of fishery production reached 212,469 tons exceeding the predetermined target set by the government (163,000 Ton) or about 130.35%. However, due to the increase of coastal mining activity, the fishery yields were predicted to be depleted by upcoming years and potentially threatening the livelihoods of more than 45.000 fishers who customarily depended on the coastal and marine resources. Apart from mining activity Bangka Islands are also known for being a highly productive ecosystem with rich agriculture resources. Before uncontrolled massive tin mining activities took over Bangka and Belitung Islands in the last decade, Bangka Belitung Provinces have been widely known as the best pepper producer in the world, *Muntok White Pepper* (*Lada Putih Muntok*) (Heidhues, 1992). Unlike other commodities such as rubber and oil palm, pepper farming business is not touched by large companies. Pepper contributed substantially to the economy of the community, nonetheless, the fluctuated price and unpredictable seasonal conditions brought the pepper production into uncertainty. This uncertainty would have a direct impact on the welfare of pepper farmers (Propinsi Kepulauan Bangka Belitung Dalam Angka 2017, 2017).

When discussing the commodity of food crops, it is not a superior commodity because of the quality of land is less supportive Nevertheless, the government continues to support the production of food commodities, especially paddy rice to reduce dependence on rice supply from outside the province. The relatively flat topography and the density of soil have contributed to the intensification of the forest harvesting on the Islands, such as *meranti* and *pelawan* timber. The potential for these forest support products has not yet been developed, so sales are still limited to the local market (Propinsi Kepulauan Bangka Belitung Dalam Angka 2017, 2017).

The potential of rattan on the Bangka and Belitung Islands is also very large; due to the relatively high rainfall, plants of the tropical rainforest, such as rattan, grow quickly. But unfortunately, rattan production has dropped dramatically due to the conversion of land for mining and plantations (Propinsi Kepulauan Bangka Belitung Dalam Angka 2017, 2017). However, trend analysis shows that the agricultural sector continues to decline even though it remains base sector. The decrease was caused by the lack of development of plantation sub-sector and Fishery; which are the two sub-sectors with the highest roles among the other sub-sectors Agriculture sector. Noting that, Plantation and Fishery Crop sub-sector must continue to be developed considering the contribution of these two sub-sectors make a big contribution to the macro economy (Statistik Propinsi Kepulauan Bangka Belitung, 2017)

Within this section of the study, I focused on two main areas, whilst considering their local dependency on the coastal resources. Central Bangka and West Bangka Regency. In addition, these two districts have a long history with mining activity. Central Bangka District is astronomically located at 105°45' to 106°50' East Longitude and $2°10'$ to $2°50'$ South Latitude. Bangka Tengah Regency is located within an area approximately 2,279,11 km2, divided into six-sub-districts comprising the *Koba, Pangkalan Baru, Sungai Selan, Simpang Katis, Namang* and *Lubuk-Besar* Sub-districts (Bangka Tengah Dalam Angka, 2017).

Unlike Central Bangka which is administratively situated directly adjacent to the mainland regency/municipal, West Bangka District is situated relatively far from the capital. However, this province is geographically strategic because it is situated close to Sumatra Island (Bangka tengah dalam Angka, 2017). West-Bangka thus becomes the gateway of goods and passengers entering Bangka through the harbor. This district is administratively divided into six sub-districts with the approximate total area 2,884.15 km2 or 288,415 hectares. Both districts are well known for their fisheries sector. In addition, agricultural sector, also strategic part, is a main resource and income for farmers as food producer for the society, as raw material producer and is a basic commodity for the industry, including food crop agriculture and horticulture, estate, livestock, fishery, and foresty. Pepper plantation commodities are still one of the majorities within this district (Bangka Barat Dalam Angka, 2017). Apart from the general geographical factor, the two districts are the largest tin contributors in Bangka Belitung. Therefore, it is very interesting to see the dynamics of resource governance in both areas and compare them to one and other.

2.3.2 Overview of Study Area

2.3.2.1 Selection of the study areas

In the initial phase of my research, I have conducted preliminary visits to both villages twice. This was to collate some evidence and draw some initial conclusions. Whilst on my visits I could draw a close focus on some of the important issues regarding tin-mining governance related issues, such as livelihood deprivation due to depleting resource, the disputes occurred as the impact of large-scale Mining Corporation's activity, etc. This opportunity allowed me to share my knowledge and find out answers to my question by talking to a wide variety of community members from eight villages in West-Bangka, Central-Bangka, Bangka-Induk Districts which represented variety subsistence groups, including fisher s, farmers, and miners.

Whilst I interviewed and discussed many research areas with the villagers something that pulled my attention was the significant influence that took place towards the mining activity such as impacting the local economy as well as the impacts of both large and small-scale land and coastal mining activities. In addition, field observations to the mining ground, fishing ground, agricultural field, and also local settlements were conducted to capture the real condition and to get broader knowledge on the issues previously discussed during pre-identification.

After gathering all the afore-mentioned information, using a simple mapping technique, I analyzed the founded facts and indented its interconnection and significance. However, owing to the financial and time limitations I decided to select two villages out of eight villages. I further limit my study and focus on particular community considering: 1). the complexity of the issues: 2). the urgency of problem-solving; 3). Time-Limit. Therefore, I selected to focus my study on coastal-resource dependent community. I further discussed the site selection criteria with supervisors and several local people and NGO activist with whom I had already interacted and took their suggestions on which villages to pick.

Using the village selection criteria, I initially arrived at a shortlist of six coastal-resource-dependent communities, visited all of them with a list of questions applied for all the villages. I gained different type of responses such as; one village was in west Bangka, was conflicting area so it was not possible to conduct research there. Another village next to the conflicting village was basically agricultural village with very less coastal mining and, thus I did not prefer to go into this village for the purpose of coastal mining pertaining issue, etc.

Before selecting the site, I had elaborate discussions with the villages to assess their appropriateness for being selected as a study village, and based on the results. I picked two fisher villages according to the following criteria:

Criteria used for selection of study sites selection:

1. Community which highly depends on coastal resource as source of living
2. Community for which fishing is primary source of income/majority of local is fisher
3. Community which is living in an area with newly operated and already having long suction dredger operation
4. Community where livelihood currently facing potential socio-ecological threats of coastal tin mining

Considering the above-mentioned criteria, I selected Tanjung Gunung Village (`A`, refer to Figure 3) and Air Putih Village (`B`, refer to Figure 3). After selecting the villages, I started investigating at the community level to get a broader overview of the concerned phenomena; my research conducted focused on small group discussions. A deliberate attempt was made to elicit the views of all subsistence groups, exploring the views of fishers from different fishing gear category, farmers, and other subsistence groups.

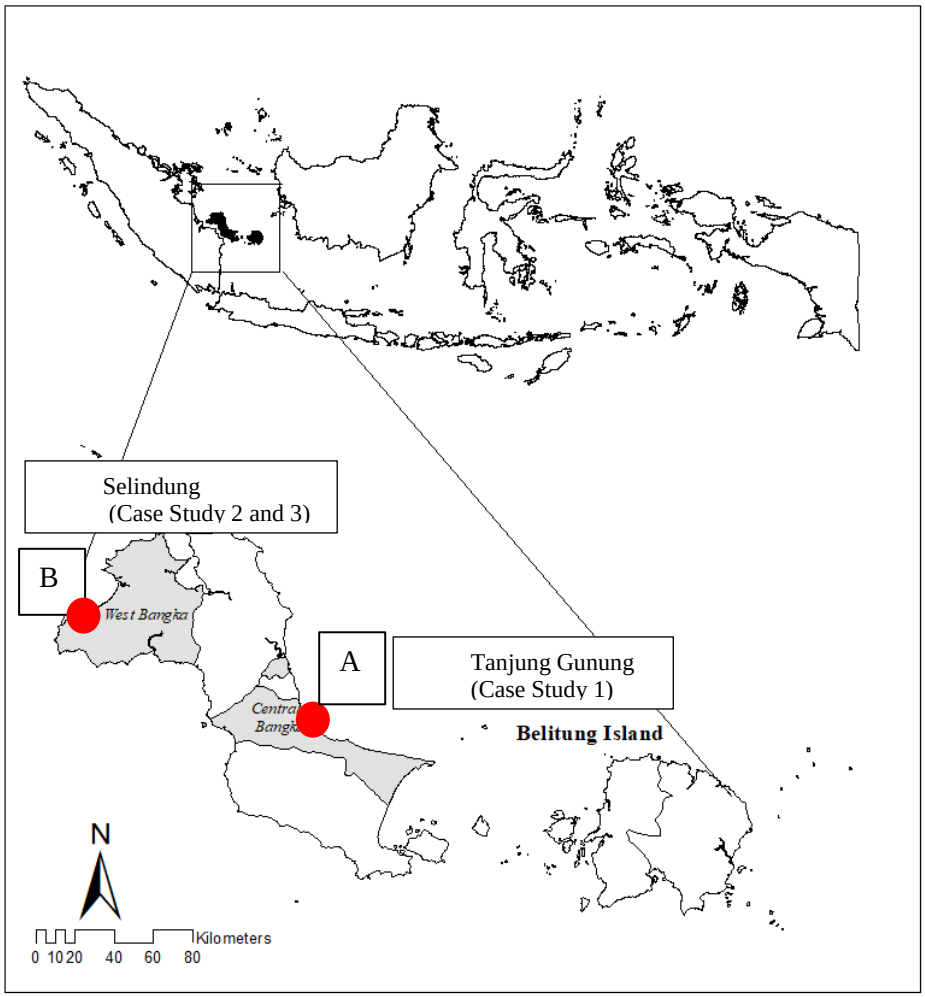

Figure 3 Research Site Map

After sensitizing the community about my research, I entered at the individual level (key informant) and household level for gaining in-depth information. Such a slow but gradual engagement with the fishers proved effective in my research. Before I could begin to gain valid information, it was vital to develop trust with the society, I therefore spent sufficient time to develop the sense of trust. It was then easier to maintain a comfortable dialogue enabled friendly and open environment with the communities during my field work. Consequently, everyone was eager to share his/her knowledge and opinion in a friendly environment without any hesitation.

I also found out a lot of information from general informal talks. These took place at mosque (praying place). I found this was where people felt more comfortable to talk spontaneously. Coffee stalls, Masjid, rendezvous of common people, are thus the most appropriate public places to verify information in the presence of experienced fishers. I hardly used the 'standard official language'; rather I used local dialects in both the communities to retain information or ideas intact during translation this way everyone felt more comfortable to speak out openly. To keep the discussion lively, and to maintain a friendly environment, I always seized the opportunity to share and appreciate their comments, and at one stage involved them in the desired discussion with another round of toast and coffee. Passing or throwaway comments sometimes provided important information and new thoughts.

From this process, I finally could capture other insights to provide a more complete picture of the situation in both villages. However, after gathering some information during my first week I realized it lacked evidence and validity. I therefore went back for a second visit and this time I conducted more formal talks with government officers and some other villagers from neighboring villages and the results were astonishing, and some other villagers from neighboring villages.

Having preliminary or an overview survey through preliminary village visits to talk to a variety of community members that brought attention to wide-ranging topics and issues was useful in getting a broader perspective on the situation in both villages and identifying important issues, there was also a need for a deeper understanding and analysis of the same issues in specific village contexts. Information and experience from the preliminary survey and other interactions were used to develop two sets of research instruments: (1). List of questions for intensive in-depth interviews and (2). Survey formats for a household level survey, for household level livelihood monitoring and for a general survey of all fisher villages in both Selindung and Tanjung Gunung.

2.3.2.2 Exploring Two Coastal Communities: Tanjung Gunung and Selindung

The study's site selection considered local dependency on marine and coastal resources and the historical background of suction dredging operations. I selected case comparison strategies whilst selecting my research sites. In case of Tanjung Gunung, I selected this village as my research site because this village has strong local institutions protecting their coastal areas; therefore, though suction dredgers were trying to propose their operation proposal since 2009, locals kept rejecting the proposal from suction dredger company until 2014. The situation behind this complexity of issue encouraged me

to investigate the reason behind their agreement and the decision-making process at the local level.

The second research site is Selindung Hamlet which is administratively situated within a coastal village namely Air Putih Village. Unlike Tanjung Gunung Village, Air Putih Village has longer suction dredging history. This village consists of five hamlets but I decided to focus on Selindung Hamlet considering three main reasons: ***First***, operation of suction dredgers operating in this village waters were mainly working within Selindung Hamlet area; ***Second,*** suction dredger operation in Selindung Hamlet water was managed by Selindung resident, without any involvement of other hamlet residents.

Tanjung Gunung Village is administrative part of Pangkalan Baru Sub-district, Bangka, historically known for its highest population density (i.e. 399 persons/hectares) among all sub-districts in Central Bangka District. This village was also formerly known as Bangka's clove-producing village. Tanjung Gunung Village is geographically located adjacent to the South China Sea Coastline. Agriculture and plantations dominate the so-called upper village, while the so-called lower village is home to the fishing community. Tanjung Gunung Village has a land area of 859,654 hectares and is administered as three hamlets. The *Malay* ethnic group lives close to the agriculture and plantation area, while the *Buton* tend to live close to the sea.

The second research site, Selindung Hamlet is a geographically remote hamlet, situated within Air Putih Village, known as a resource dependent hamlet. This hamlet is geographically remote and isolated from the rest of the village. Access to the hamlet was difficult this was due to the muddy roads and the lack of public transportation. From all this, I was able to judge how much the people living in the hamlet were isolated from the rest of the village, its markets, and even the schools. Historically, people living in both sites engaged in a mixed economy that comprises the socio-cultural combination of traditional fisheries and shifting cultivation communities; wrapped in strong mutual cooperation among people. Bangka Malay is the dominant ethnic group in White Hamlet.

Apart from their production systems they predominantly served as subsistence whereas others were only generating incomes. The mode of production pattern was conducted in groups which give the effect of individual dependencies among each other. Locals said that activity as fishers was not only meant as an economic activity for generating income, but also a personal actualization and identity as a fisher. In addition, agricultural activities were also hereditarily transferred from their ancestors. However, living in the coastal area, subsistence activities of in both communities are strongly influenced by the seasonal conditions. The weather conditions are the important external factors that influenced the susceptibility of the region. When the weather was supportive, fishing activities ran smoothly. However, when the weather was less friendly, fisher's activities were hampered. It was then questionable how the locals survived when the weather conditions did not allow them to fish, so I then conducted further research and found out they considered agriculture was also to support their livelihood source. Pepper was the next most successful cash crop, it was saving its value hugely due to its relatively stable and high selling price, therefore in difficult times, and locals sold pepper to supply their local needs.

It was evident in my findings that both coastal communities were highly dependent on coastal resource availability for their livelihood. They were highly prone to natural calamities and accidents at sea; family members remain uncared for at least six months per year (male counterparts go for sea-fishing as paid labourers) when women carry exceptionally responsible productive and reproductive roles. They are disadvantaged and resource-poor, uneducated. Most of them remained indebted; they have little or no access to institutional credit supports. Given the consequences of the sharp decline in a catch on their income and livelihood security after massive coastal mining, they view fishing as an insecure birth-ascribed job and one of the most marginal occupations of the last resort.

2.4 Data Collection Techniques and Methods of Data Analysis

2.4.1 Methodological Approach

For decades, quantitative and qualitative purists formed distinct schools of thought. While drawing on strengths and minimizing the weaknesses of both, a new 'mixed method' approach (Creswell 2003, Johnson and OneGuide 2004) evolved. As my research was solely aimed at capturing the realities that occurred at the local level, I adopt mix-methods that is the combination of combining qualitative and quantitative study approach, to explore the complexity of issues pertaining the local governance, local participation and decision-making process, and also on how the affected local community understands and adapts to the changes they are facing in their daily life. There is an extensive literature devoted to analyzing the mixed method approaches that have recently risen to prominence. Zohrabi (2013) mentioned that mixed-methods research offers great promise for practicing researchers who would like to see methodologists describing and developing the techniques that are closer to what researchers actually use in practice. Mixed methods research as the third research paradigm also helped bridge the schism between quantitative and qualitative research (Onwuegbuzie & Leech, 2004)

I further choose a multiple case study design which enables me to compare the decision-making mechanism in issuance of social permit across distinct settings, different jurisdictions, different community context, and different tin mining historical backgrounds. The case I selected for this study have strategic significance in relation to the problem of governance arrangements, and the environmental and social impacts of Suction dredging mining activity. There are compelling those who really agree, those who disagree, and those who disagree, but have to agree, to speak with one voice and give their permission to conduct dredging operations.

The reason that more researchers are opting for these types of research is that both qualitative and quantitative data are simultaneously collected, analyzed and interpreted (Zohrabi, 2013). Mixed methods research also is an attempt to legitimate the use of multiple approaches to answering research questions, rather than restricting or constraining researchers' choices (i.e., it rejects dogmatism). Cresswell et.al. (2013) mentioned that majority of mixed methods research designs can be developed from the two major types of mixed methods research: mixed-model (mixing qualitative and quantitative approaches within or across the stages of the research process) and mixed-method (the inclusion of a

quantitative phase and a qualitative phase in an overall research study). Brown (2001) divides the research design into four parts: "purely statistical, statistical with some qualitative, qualitative with some statistics, and purely qualitative." The quantitative research report is usually presented in numerical forms along with the relevant tables, diagrams and figures.

However, the qualitative research report appears in a narrative form and its organization is flexible. As Creswell (1994,) puts it "the results will be presented in descriptive, narrative form rather than as a scientific report." The important issue in this process is to represent the outcomes as completely and clearly as possible. In qualitative research, the researcher makes every effort to recount the process of research because the process is more important than the sheer product. As Brown (2001) asserts this account of the "story may differ in structure from project to project and report to report."

On the other hand, a study might be a mixture of qualitative and quantitative researches. To this end, the organization of the report might be in a hybrid form. Therefore, if the design is a mixed approach a combination of descriptive and statistical report forms might be rendered. However, Brown (2001) stated that "you may need to decide whether it is primarily a statistical study or mainly qualitative in nature. Therefore, the researcher should know which of the approaches is the predominant and accordingly prepare a report on those bases. To get a deep understanding and clear investigation, I mainly adopted the equalization approach supported by quantitative approach to provide precise, quantitative, numerical data. In order to explore the deeper understanding of the local perception within both Tanjung Gunung and *Selindung*, a mixed-method technique is one of the best approaches.

My research also employed participatory techniques and observation in the context of a qualitative approach. According to Bagnoli and Clark (2010), the participatory approach would increase the depth involvement of participants in every process. Therefore, in this research I applied two types of interview 1) semi-structured interviews and 2) focus group interviews. All the information was collected from interviewing selected household respondents and diverse informant groups, such as subsistence groups, housewives' groups, youth group, fisher association, etc. The amount of fisher involvement and the information gathered from them made this research more community-based and participatory.

2.4.2 Data Collection Methods

There are four procedures of collecting data applied in this research:

1). Household Survey

The intensive survey I used was carried out in the household level utilizing both structured and semi-structured questionnaires. Questionnaires were doubtless one of the primary sources of obtaining data in any research endeavor. However, the critical point is that when designing a questionnaire, the researcher should ensure that it is "valid, reliable and unambiguous" (Richards & Schmidt, 2002). Survey questionnaires were prepared at different stages of the research. First, a household survey questionnaire was prepared based on the outcomes of the preliminary survey ranging from demography and livelihoods and attitude and perception towards suction dredger operation. The first draft of the

questionnaire contained open-ended questions to maintain a free flow of answers rather than restricting households to pick from a given list of responses. The questionnaire went through rigorous field-testing in both sites and necessary revisions were done before it was implemented in the two selected study sites within different sequences.

In Tanjung Gunung, the household I interviews were a random selection using the cluster sampling technique, I felt this way the results collated would have been fairer and accurate. I interviewed 70 households out of 862, representing different subsistence groups. While, in Selindung Hamlet, Household surveys covered 80 respondents. In total, I interviewed 85 respondents in total but I excluded 5 respondents from the analysis because they were not permanent residents of the study area and therefore, their responses would have not been realistic. In both sites, the household survey was aimed to specifically ask about household characteristics, household subsistence and livelihoods assets, dependency on coastal resources, perception on suction dredger operations, compensation, and royalty, and the perceived impacts of suction dredging on local resources; participation in Public Consultancy Meeting (PCM). I also gathered data on Tin Loading Activity and involvement as a Committee in Selindung because the suction dredger operations began a few years earlier than Tanjung Gunung.

The household survey questionnaires were orally administered by me. In both sites, the household survey had primarily targeted the head of the household, but if unavailable, another adult member of the household was interviewed. However, an attempt was made to include as many family members as possible, including women and youth, in the process of filling out the survey questionnaires. No time limit was imposed on completing a household survey and each of them depended on the level of participation a household could offer, both in terms of time and information. I felt it would not be good to put a time restriction as the household participants needed to feel comfortable in order to speak out.

Having a survey that included open-ended questions provided the flexibility to elicit a variety of answers and get into useful discussions whenever necessary. Thus, it should be noted that I did not strictly follow the questionnaire opting for a conversational and informal tone of interview, and exercising flexibility in altering the line of questioning or to seek further elaboration. This process of conducting household surveys essential to gather useful information on several related issues. This style of interviewing enabled me to establish rapport with interviewees as well as maintain sensitivity which was critical given the subject matter on an average; each household survey took about 60 to 90 minutes. Of course, a few ended in just fifteen to twenty whereas some others took up to 2 hours or a number of revisits over several days.

2. Key Informant Interviews

Interviewing is widely known as the most common method of data collection in social science research and is a primary data collation method, which I believe is more realiable than any other method or secondary methods. The interviews formed a significant portion of the data collected because it provided the best opportunity to probe into perceptions of locals on perceiving the penetration of suction

dredging operation and how it influences their daily survival livelihoods. I used some predetermined set of questions resulted from preliminary studies, to help structure the interviews.

Types of the interview may range from informal and unstructured to semi-structured and structured. While we often tend to use one type of interview as the dominant method in our research, we often use other types throughout the research period either consciously or unconsciously. One advantage of the key informant interview was I could read the respondent instantly; I could analyze their true feelings and thoughts on the matter. Whereas with other methods such as questionnaires you would not have this privilege and could not depend on those answers only. Interviews are best conducted when the interviewees have no difficulty in remembering or describing something related to their field, therefore some interview may take longer than others.

According to theorist Bernard (1988), there are four main interview techniques that need to be followed whilst interviewing participants. Including 1). Informal interview (absence of structure or control); 2). Unstructured interview (clear plan and minimal control); 3). semi-structured interview (use of interview guide) and a structured interview (response to an identical set of questions). However, irrespective of their types, all interviews involve human interactions thereby subjecting the different processes of interviewing to a similar set of dynamics. Another important aspect is the appropriate use of these interviews, which is dependent on the duration of the research and the specific context within which the research is conducted.

All four types of interviews were used to varying degrees during the research in both Selindung and Tanjung Gunung. Mainly, I used a two-prong approach to the use of interview methods to minimize the bias. I used the informal interview in the initial phase of the research and then moved to unstructured interviews in the subsequent phase. I used semi-structured and structured interviews after the study villages were finalized. For these reasons, beach found to be the best places for interviewing the fishers, particularly after they came back from work. Nonetheless, fishers frequently reject to be interviewed at the beach because they were exhausted after work. In such condition, I mostly rearranged another meeting by visiting their home and this was they had more focus on the questions. For farmers, similar situation, having interview during lunch break in their field is one of my applied strategies. However, due to time limits, I also adopt similar strategy as I applied to fishers, home visit interview, particularly for miner because it is not possible to have intensive interview because of noise and time-constraint.

Whilst conducting these researchers I had to be careful and show respect to the social beliefs. Most of the time, I talked with them while they were cooking or doing other household activities in the open backyard areas of the homesteads. Special arrangements were made to communicate with some key informants when further clarity on certain issues was needed. However, I avoided having clarification of interview concerning sensitive topics in public forum such as, hamlet or village meetings because it will affect the interviewee psychologically and may lead to bias.

3. Focus group discussion (FGD)

FGD is now widely used in participatory research. Focus group may be defined as an interview style designed for small groups where the researcher strives to learn through a discussion about conscious, semiconscious, and unconscious psychological and socio-cultural characteristics and processes among various groups (Basch 1987; Berg 2004). Thus, focus groups allow the researcher flexibility, the scope for observation of interactions, a collection of substantive content within the limited time frame, and access to various sub-groups within the community (Berg, 2004).

I have conducted 8 FGDs in total and 20 smaller group discussions during the research in both sites. Focus Group Discussion with; both male and female participants were arranged on several topics such as the trend of local resource utilization, the socio-economic and ecological setting changes due to mining activity, the mechanism of suction dredger operating license, its impacts and benefits on locals and their adaptation strategies. Planned focus groups were conducted at different stages of the research in order to gain critical inputs from the community. A few focus groups were used to commission the research at the community level and also to present and verify the preliminary research findings.

Even though focus group discussions are an effective method of data collection, they are not free from problems. Talking to several smaller groups in a hierarchical community always runs the risk of leading to controversies and confusions. It is hard to analyze everyone's viewpoint, and not everyone gets an equal say. Dominant groups may doubt the intentions of the researcher behind what they may see as "secret talks" with certain groups. Moreover, interacting with women in a typical male-dominated rural Indonesian community can be challenging. However, my experience in this regard was very positive as I was able to conduct several meetings and discussions with women groups. When special meetings were organized, women came in good numbers and articulated their views clearly. My long-term involvement with the community was a factor for successful women group meetings as I had already interacted with most of them in informal settings.

4. Participatory observation

This technique appeared to be the most useful, effective and straightforward way to learn about people's livelihood dynamics, motives, values, beliefs, interests, and their indigenous knowledge directly and confidently in social settings through immersion into the local cultural milieu. The participant observer comes to a social situation with the purpose of engaging in activities appropriate to the situation and observing the activities, people and physical aspects of the situation (Spradley, 1980). Activities, like voyaging with fishers, carrying out need-based complementary roles in the fishing operations, and attending numerous rituals in the fishing villages, helped me have a day in their shoes and realize the real world of the fishermen and what they experience. I observed that fishers are more generous and participatory in their responses 'on boat' than 'on land'; they appear more thoughtful in the evening and night. The night halt with the fishers in the hairs and the sea proved very useful for

directly learning about their indigenous ecological knowledge.

5. Other participatory techniques:

The seasonal calendar illustrates the captured information on fishing, agriculture, and mining seasons and its complexities and dynamics of fishing and rural life during different months of the year. In addition, wealth ranking also conducted to categorize the community members based on wealth; these were carried out in small groups. Field observations were used to clarify responses in the household surveys and key informant interviews. An extensive literature review of Internet-based journals, books, theses, and other documents was supplemented by a review of secondary documents from government and private institutions. Secondary data were collected extensive literature review (internet-based journals, books, theses, and other documents), supported by secondary documents from locals, government, and private institutions. However, there are some challenges listed during data collection process, including:

1. Access to Primary Sources

It was quite hard to arrange interviews with the primary source who are in the high-level position; especially those who are in the government and parliament. The second issue was the difficulties to reach to the primary sources in the grassroots, where some were living in the pure remote areas with a very limited of transportation access. However, I believed this difficulty had to be overcome. Therefore, I still found a way to visit some of these less remote areas.

2. Reliability of Primary Sources

There is a possibility that the primary sources' answer does not reflect the actual logic that drives the decision making for this local actor. The solution was to be prepared with supporting documents and evidence (available secondary data) that may be used to counter or confirm the primary sources' answer during the interview.

3. Multidimensionality of Research Discipline

This research was case-driven rather than subject discipline-driven; therefore, it was difficult to specifically limit the subject discipline of this research. The combination of various theories from different disciplines was inevitably needed in providing a comprehensive and multi-angular perspective-driven analysis in assessing the various data and findings.

Solution: the research remains very much within the subject discipline of development sociology, nevertheless the research acknowledges the importance of theories from other discipline in providing an analysis that better reflects the case study fundamental rather than submitting to the fundamental notion of such subject discipline that may limit the scope of solution, which at the same time may compromise the reliability of the solution offered to answer the research questions and achieve research objective.

4. Influence of researcher's knowledge and experience on observations and conclusions

Sometimes it is known that researchers can make a conclusion based on a certain situation

according to their own observation in the field rather than what information has been passed on, which then in this case might not be a true reflection of the participant's thoughts. Therefore, to eliminate this type of bias, I verified all the observation and conclusion with the help of data collected during the semi-structured and focus-group interviews.

5. Some problems or issues may be left unnoticed

Sometimes, the duration of interviews could limit the research as some areas and issues may be left unnoticed in the interest of time. If more time was allowed to explore further and more time was allocated I believe more and more evidence could be generated. To eliminate this bias in this particular research, all the interviews were recorded, and the researcher listened to the recorded interview before proceeding to another interview so that missing elements can be addressed in the next interview.

2.4.3 Data Analysis

For data analysis, households in Tanjung Gunung were grouped into six categories, based on their livelihood dependency: Net Fishers, Bubu Fishers, Seasonal Fishers, Miners, Farmers, and Others (Shopkeepers, Village Officials, and Labor involved in tin mining). Net fishers included those who earned the largest portion of their income from fishing using nets. Bubu fishers use fish traps, called Bubu, made of wire, while miners who are part of a group of small-scale community coastal miners use pontoon units for mining extraction, and seasonal fishers choose the work they will do by season. The smallest household group is comprised of farmers, due to the limited availability of suitable land for agriculture. Other categories include civil servants, shopkeepers, and the laborers who help small-scale tin miners.

For the Selindung Case Study, elected households survey respondents were grouped into three categories based on their agreement or disagreement on suction dredger operation to analyze the decision-making process and their involvement. The first group represents those who disagreed and rejected suction dredger. The second group represents the neutral in which they do not show a clear standpoint towards rejection or agreement. The last group, the third group, represents those who agreed and supporting the suction dredger operation. But in analyzing adaptation strategy of households I adopted subsistence based grouping following the existing subsistence groups in this area, Fisher, Farmer, and Miner. Data collected from intensive household survey were further presented by simple percentage statistics using Excel 2010 and is presented descriptively. Utilizing data from a household survey we categorized data on perceptions of accepting or rejection suction dredgers and were analyzed quantitatively, using simple percentage statistics using MS. Excel 2010.

I analyzed data from key informant interviews and focus group discussions on the local decision-making process by making a flowchart, describing the mechanism of suction dredging operation license issuance. Mining license procedures were divided into four steps, 1). Mining Operation License Permit Proposal; 2) Public Consultancy Meeting; 3). Decision making to accept or reject the proposal, and 4).

Operating Procedure. Stakeholders involved in all these four processes were identified and presented in a flow chart to analyze the role and relationship among them over decision-making on suction dredger operating license. The data collected during key informant interviews were analyzed qualitatively and presented descriptively. The analysis of mechanism of compensation and royalty distribution and is performed and presented descriptively. The analysis achieved included the determination of beneficiaries, the amount of money received, and the additional provisions in the distribution process. Finally, Perceptions on benefits of suction dredgers and the perceived impacts of suction dredger was categorized into not-important, less-important, important and very important.

Furthermore, we analyzed demographic and socio-economic data to provide background information on demographic and community's socio-economic conditions. In addition, we also conducted a rank survey to identify the economic status of locals by using scoring techniques. Five pre-identified indicators were used to rank wealth status i.e. housing (house condition: non-permanent; semi-permanent, permanent; size of house; furniture availability; flooring); variety of income sources (sources of income; type of income sources: temporary or permanent; number of productive household members), saving (cash and pepper) and loan (bank loan, mortgage, credits), land ownership status and its size, boat and fishing instruments ownership. All values were further calculated and ranked, before being categorized into three groups: 1) low: total score 5–11; 2) medium: total score: 12–18; 3) high: total score 19–25. I use households and families as interchangeable descriptors assuming that:

1. The boundaries between household and family are fluid, and both refer to a physically identifiable residence and are organized through kinship lines and rules in the fishing villages.
2. In the context of Bangka`s community, household is considered as a composite social and economic (also cultural and political aspects of reproduction) unit consisting of one or more individuals who live together, and share both the 'roof' and 'the pot'; (i.e., dwelling place and food), income and labor for ensuring that 'mutual sharing exists and continues.
3. Households are not static but extremely dynamic. Every household serves basic functions of consumption, biological reproduction, social networking and distribution across members as determined by sets of ideologies and values. The expansion and dispersion stage of poor

Therefore, I purposefully choose individuals, households, and communities to help with the research behind social and economic classes. It helped analysis, shifting seamlessly between data and these levels of aggregations. In situations where production and ownership relations within the community or institutions are complex, interwoven and multi-layered with competing interests, I have surfed beyond the boundary of the study of villages.

2.4.3.1 Ethical Statement

Consent from community has been obtained through written research permits from Central Bangka, and West Bangka District Government. Both Tanjung Gunung and Air Putih local village

governments then granted me verbal permission to conduct my research. Prior to the start of the research activities, I visited the study area to explain what I would be doing and why I was doing it; we later verbally asked the villagers for their agreement to those activities. I also asked the villagers to help us in identifying appropriate individuals (those who had relevant knowledge) for key informant interviews and focused group discussions. Prior to conducting each focused group discussion, key informant interview, and the household survey, I re-explained to the participants the aim of the activity, how they were selected, that their comments would be recorded, and how I intended to use the data we collected.

During any field interaction, the participants identified themselves by their individual names. Self-identification by the participants was primarily seen as part of the local culture where it is customary to introduce oneself to outsiders by name and also institutional designation. All participants were asked to give their verbal consent before I proceeded with and recorded the interviews and if anyone did not want to be recorded this was also allowed and respected. (I also collected personal and demographic information from participants. However, no individual participant was forced or motivated, in any way, to disclose her/his name if she/he choose to stay anonymous as it was part of our duty to protect their dignities and make them trust our research foundation. As a principle, the original names of the participants were protected by a measure of anonymity. The names of the participants were only used in order to clarify or verify data during the field research period.

In my analysis, all data were kept anonymous to protect the respondents' confidentiality. All of the data and names provided had been kept confidential between me and the participant and stored in a secure location only accessible by myself. Once the research is finally complete, all records containing the participants‟ names will be either blacked out or shredded. The same measure will also be taken in case of digital records by deleting the participants‟ names from such records after the research is over. Since I speak and understand the local language at the study site, no translator or transcription assistance was used for this research, which has been a great benefit to help maintain the confidentiality of the participants.

This research purely focused and dealt with human subjects only. During this research, there was no direct or indirect risks involved, it was all based on normal day to day activities. No financial compensation was paid to the participants in the research activities. However, as a complimentary gesture for their participations small community and group feasts were organized in accordance with the local culture. Moreover, provision of food was made in all community workshops and group discussions that lasted more than half a day.

CHAPTER 3
HISTORICAL OVERVIEW OF TIN MINING AND ITS DEVELOPMENT IN BANGKA ISLAND

This chapter focuses on the historical overview of tin mining in Indonesia. It discusses the prevailing economic orientations during different political regimes. It begins with unpicking the general overview of the significance of tin mining in Bangka Island. Next, the chapter discusses the changes in political conditions which enabled varying perspectives on mining and consequently affected the formulation of economic policies and the environmental safeguards placed on mining activities.

3.1 The Significance of Tin Mining Extraction in Bangka Island

Tin is known as one of the oldest metals known to humankind. It has been used mainly in the form of an alloy (bronze, pewter) since the ancient time before the 1100s. By the late nineteenth century, it becomes a crucial component for the industrial civilization (Ross, 2014). With the development of solder, pewter and tin plating, tin becomes a far-reaching demand for thousands of essentials and innovative uses, right through to the modern age. In the 19th century, Cornwall in the UK was the major producer of the metal, but then deposits were found in Australia, Bolivia, and East Asia. Today China and Indonesia are still the leading producing countries, followed in importance by Peru (ITRI, 2016). Tin was discovered in Indonesia in the early 1700s by Dutch colonists for the first time and has been mined intensively ever since (La, 2001). Ballard (2002) mentioned that the tin mining industry in Indonesia had further increased exponentially under the control of different countries.

Bangka Island is known as the major source of Tin as well as the most prominent in both Asian and world trade (Emran, 2008). This island (area 11,340 km^2) lies at 2°S, 106°E in the South China Sea. It administratively belongs to the Bangka Belitung island provinces along with 470 other islands in Bangka Belitung Province. Out of all these islands, only 50 are inhabited (Alevi et.al., 1973). Situated in the southern part of Sumatera, Bangka Island has become one of the important trade routes that connect between Sumatera, Java, Borneo, and Riau Islands (Withington, 1967). As a result, Bangka Island is considered economically and politically strategic. Bangka Island has been extensively cited as the tin island of Indonesia where large-scale tin mining excessive extraction in the island has attracted the attention of many national and international scholars regarding its sustainable utilization (Ross, 2014). Producing 90 percent of Indonesia's Tin equals to a third of tin available on the world market, the world depends on tin from Bangka (FOE, 2014),

Since the colonial era, tin was considered as a strategic good by almost every ruling colonial authority, including Dutch, British and Japanese. Despite giving great economic contribution through tax and revenues, Bangka's tin had been a source of conflict among various parties' due to its value since its first exploration during colonial periods (Ibrahim, 2016). Therefore, Ibrahim (2016) also

emphasizes the fact that this island has been always considered as an unlimited source of tin. In the 1990`s after a result of the collapse of two major Tin producers (Malaysia and Thailand) Kaur 2004. Bangka Island along with Belitung emerged as the only tin-producing region in Indonesia and South-East Asia. Alongside the crumble and two new places taking over the tin mining, other changes also took a rapid change in terms of policies and regulatory frameworks even after the independence of Indonesia (Howard, 1994; Erman 2008); Ibrahim 2016). Eng (2014) expressed that due to the shifting to old regime order, tin became a strategic commodity and it was officially recognized as a state asset automatically being taken into care by of the state authority. Singawinata (2007) argued that having centralized ruling governance during new order regime, people were not being allowed to mine and the government applied strict punishments for any mining by local individuals. In addition, Singawinata (2007) also emphasized that the authority of tin extractions was only given to a state-owned-company and another private company whose capital was partially owned by the government, thus domination by the state is very high at that moment.

The fall of new order regime, known as Suharto regime in 1998 caused Indonesian democratization movement along with the decentralization of the government and greater regional autonomy (Hadiz, 2004). The decentralization of mining governance resulted in the booming tin era. To elaborate this was when tin could be accessed by non-state actors such as local private businesses, and the local community of Bangka Islands (Neilson, 2016). Hence, it opened a democratic space for the local community to obtain economic benefits from tin extraction, through small-scale mining activity. On the other hand, the boom of the tin mining industry had a severe negative impact on the destructed ecosystem of Bangka Belitung Islands. Furthermore, as a new reformed province, losing their 320,760 hectares' productive areas, Bangka Belitung was further recognized as one of the most degraded provinces in Indonesia. Severe destruction was also shown by the abandoned mines that covered approximately 1,053,253.19 hectares or 64.12% of the land in Bangka Belitung. Moreover, 810,059.87 (76.91%) hectares out of all the abandoned mine exist in Bangka Island.

In addition, data showed that each year 5,400 ha of Bangka Belitung land (forest, agricultural land, and local people's plantations) and thousands of acres of local people's agricultural lands had been converted into the mining area. They even mentioned that it only took around three months to convert a hectare of land into a tin mining area to cover around fifteen to 20 groups of miners. Not only mining but also, the occupation of 230.000 hectares of Bangka's Land by large-scale palm-oil plantation companies during tin boom era hugely worsen the ecosystem problem in Bangka and affected the living space of people. Consequently, only less than 300.000 hectares of land remained available for local settlements and other survival sectors.

Long before tin mining became popular among the people of Bangka and Belitung, the community enjoyed a relatively sufficient level of welfare, the village farmers. Moreover, food security was also ensured for generations of peasants in every village of Bangka Belitung province. Even, before the

pepper farms and rubber plantations had been developed, small-holder peasants utilized planting land for rice paddies (human or be home in the local language), as well as other farming, either in groups with shifting-field patterns or individually. However, changing the mode of production from farming to mining caused damage to the functions of natural resources for sustainable agriculture. According to a recent evaluation that took place in 2013 by Indonesia's Environment Ministry, the present net value benefit from tin mining in West Bangka district was minus IDR 336 trillion ($28.5 billion) over the 2007-12 period. This negative number is caused by the high costs of health impacts, payments for clean water as an alternative for polluted water, and funds needed to manage decreasing productivity in non-mining sectors such as agriculture and fishery, due to erosion and land pollution caused by mining activities. These conditions showing all part of the local resource curse occur in all districts of Bangka that produce tin. Per capita, people from Bangka Belitung Islands province are among Indonesia's top fish consumer.

Tin mining is taking place by the public residents have been strongly developed by financial situations. Nevertheless, it has brought together locals to the high dependency on tin mining which is considered having unclear regulations. Meanwhile, mining is a continuous cycle where inequality will also keep taking place. Nonetheless, Community`s mining is gradually depleted due to the limitations of technology and the reachable mining site depth. On the other hand, locals were facing the issue of the depletion of tin stocks along with the agrarian threat. Land competition and the income gap has become a problem around the mining area. As the consequence, social conflicts became the phenomenon going with the mushrooming of local tin mining. It is accurate to note that fishermen both offshore and onshore mining have been disturbed, the damage came as a result of the mining on a coral reef. This caused damage to the habitats which greatly influenced fishermen's income. Recovery cost of tin mining is much greater than the benefit that has already obtained until this time.

3.2 Historical Overview of Tin Mining in Indonesia

The historical trajectory of tin mining emergence and its development in Bangka Island has been divided into three periods: tin mining in the colonial period, tin mining after independence, tin mining in new order era and tin mining in regional autonomy era.

3.2.1 Tin Mining in Colonial Period

There have been great changes in political conditions, which bring about varying perspectives on mining and thus affect the formulation of economic policy and the environmental safeguards placed on mining activities. It is useful to start with a short introduction of how mining activities were during the colonial period. In the late 17th century, during pre-colonial period, the demand of tin was growing more rapidly which was triggered by the swell of the demands of Chinese products in Europe, the growing tin market in India (Chuan and Cleary, 2005). Nonetheless, in early 18th century, the demand of tin was increasing but so was competition from other European powers and from Chinese traders who sailed to

Southeast Asia (Pomeranz, 2009). [1]These circumstances undermined the beginning of tin monopoly in Dutch Colonial Era, represented by *Vereenigde Oostindische Compagnie* (VOC) (Anderson, 1983).

Erman (2008) researched the historical narrative and the findings showed; that during VOC period, the local community could have access to tin, though capital access was strictly under control of the local leader. Erman (2008) also emphasized that as the consequences, local miners were obliged to sell their tin to VOC on a fixed price. In 1880 VOC had to face bankruptcy and it got dissolved, singling the beginning of Colonial Period in Indonesia. As the consequences of their failure, VOC had transferred their property and territorial possessions to Dutch government (Furnival, 2010). Therefore, from 1st January 1880 Indonesia was then formally colonized by the Dutch government.

In the beginning of Dutch Colonial period, Bangka Island was still under the control of [2] the *Sriwijaya Kingdom* which was ruled by Sultan (Erman, 2008). Furthermore, Erman (2008) mentioned that during the sultanate ruling system, tin mining mechanism was known as *Timah ladang* (tin mined in the field), meant that tin sand was dug up when people were clearing the forests and preparing for the agriculture. This system was further triggered locals to adopt mixed livelihoods by combining either field cultivation, forest products gathering, or fishing and tin mining by panning in rivers (Erman, 2008). Sultan of Palembang also set up regulations to control Tin trade, locally known as [3]*Timah ban*. During that period, the value of tin gradually increased as a response to tin market enlargement (Kaur and Diehl, 1996). Due to the awareness of the increasing value of tin, Sultanate brought Chinese migrants and organized a system called *kongsi system*. Both Chinese and local miners were included in this kongsi system. As the member of Kongsi, they would gain profit by selling the tin to the mining owner to the sultan representatives (Heidhues, 1993).

Chang (2011) had drawn focus on the relationship between Palembang Sultanate and Dutch and mentioned how it was further legitimated by the agreement contract on tin extraction and trade between them. This contract had begun by adopting a monopoly system in which it then changed into domination under Dutch colonization toward areas in Nusantara (Chang, 2011). This agreement then caused major changes and opened room for tin smuggling to take place. The high price gap between free market and monopoly; the long marketing chain; the large commission taken by individuals who involved in the illegal tin were pointed out to be reasons for the rapid development of tin smuggling. In addition, geographical setting and strategic position of Bangka Island in *Malaka Strait* provided feasibility and opportunities for smugglers (Heidhues, 2017).

In 1812, the British flag was hoisted in Bangka, followed by the transfer of rights from Sultan of Palembang to the British Government (Ibrahim, 2016). Even though the British controlled Bangka only

[1] VOC Abdallah persekutuan dagang asal Belanda yang memiliki monopoli untuk aktivitas perdagangan di Asia

[2] Sriwijaya Kingdom known as super powerful and maritime traditional state in Southeast Asia during the seventh century

[3] An amount of tin to be delivered by each male person before getting married in Bangka, as the indication of subjugation to Palembang

for a short time, Ibrahim (2016) stated that the changes they introduced had far-reaching consequences. They made changes that aimed at changing to the political economy of tin including the administration system, control of population and villages, tin resources,which then began to introduce the strategies to control and prevent smuggling. After the British administration ended, management in Bangka then shifted back to Dutch government which at that time reigned in Indonesia. The legal framework of the contract between the British and Sultan of Palembang become the basis for the Dutch colonial government`s (1816-1942) control over Bangka Tin in the coming colonial period (Erman, 2007). Sujitno (1996) suggested three important implications occurred after the shift of ruling colonial government from British to Dutch:

First, in 1918, the Dutch colonial government issued in regalement and tin regulations that were considered as a stepping stone for the Dutch who transformed Bangka Tin into a strategic state-controlled commodity. This regulation stated that 1). Exploitation of tin mines in Bangka was under the authority of a control of the Resident; 2). Tin was fully monopolized by the Dutch government; 3). Private tin mines were completely prohibited.

Second, the colonial government`s effort gained access towards tin resources accompanied by the resettlement program for locals, that had been started for a short period during British colonial government. The purpose behind this settlement was to make them easier to control the locals, counting the population, levy taxes, recruit obligatory workers and most important obtain large land for further tin exploitation. The resettlement policies for Bangka's community were proved ineffective as until now. Many, Bangka farmers still do not occupy their houses but stay in shacks within their dry fields. Moreover, it gradually marginalized local people from their involvement in obtaining profits from the tin resources.

Third, when the Dutch government enacted its liberal economic policy in the 1870s, it was stipulated that in Bangka there was no system of communal land ownership or traditional law arranging the system for the land ownership transfer to take place. The government considered the lands unused by the population as it was owned by the state and was ready for exploitation if it contained tin deposits. This limitless control by the government was also reflected in the regulation that if a tin deposit was discovered on pepper or rubber farms or inhabited settlements, the government had the right to start the mining thereby providing compensation to the owners. Dutch control over this island and the regulation of tin exploitation caused enduring conflicts between the Bangka elite which formerly acted as agents of the sultan of Palembang and the Dutch colonial government. The position of Bangka traditional elite, known as *Deputy*, becomes marginal in the terms of political and economic power. These disputes caused conflict between Dutch colonial government and the insecure elites who were struggling to maintain their lost status and source.

Practically, tin has been contested by various parties and always become strategic goods in every colonial authority. The Netherlands retained its power in the area until World War II. Tin mining was

continuously developed along with the new mining technology introduced by the ongoing subsequent arrival of thousands of Chinese miners. In 1942, the Japanese ended the Dutch rule in Indonesia and took full control. The Japanese occupation put a halt to mining activities in Dutch's Indies, especially fifty-four of them due to the damages caused by war during the mining. However, the Japanese occupants realized the importance of mining to support their war campaign, and through 16 zaibatsu and 13 other big companies, they made investments that were worth 198.872 million yen. After the declaration of Indonesia's independence which was followed by the enactment of the Constitution 1945, some mining facilities were taken over by Indonesians (Sangaji 2002: 46-47). In the vacuum of power after the Japanese lost the war, Sukarno and Muhammad Hatta proclaimed Indonesia's independence on 17 August 1945.

3.2.2 Tin Mining in After Independence

Governance of mineral resources in Indonesia has dynamically been changing continuously, along with the shift of political regimes. On the 17th August 1945, Indonesia declared its independence and followed the formation of the basic constitution of the Republic of Indonesia. The first verse of Article 33 of the 1945 National Constitution (UUD 1945) clearly stated that natural resources were under the sovereignty of the state and that their use should have been maximized to bring prosperity to the people of the Republic of Indonesia. This Article is the legal basis that allows any capable entity or institution in the country to explore, use, manage and use natural resources to bring the people's wealth to a higher level as the goal. Regarding the goal, it is highly expected that people's prosperity will be significantly increasing through the exploitation of such resources.

Between the years 1945 and 1959 the Independence, Instability, and changing, governance was marked. Tin was then nationalized as state asset and by itself. It was controlled by the country under presidential system until 1949 (Husnial, 1983; Sujitno, 2007; Susilo & Maemunah, 2009; Ibrahim, 2016). This system was further replaced by the parliamentary system that lasted until 1959. During the parliamentary democracy period, the Indonesian government was still using the Dutch mining regulation known as *Indische Mijnwet*. However, in 1951 some of the parliament members led by Mohammad Hassan proposed the amendment of mining law to the parliament. The main objectives of this proposed amendment were to ask the government to immediately form a State Committee for Mining called as "*Panitia Negara Urusan Pertambangan*" to work intensively in one month to restructure the mining regulation.

In 1959, the guided democracy regime was adopted. Indonesia was trying to implement the liberal democracy; therefore, President Soekarno took the initiative to overcome the instability problem by using centralized and "iron fist" government system, known as Guided Democracy system or *Demokrasi Terpimpin*. The first step was taken by Soekarno's government when they started to seize the Dutch's mining companies under the nationalization program was helped to prepare and establish the state mining companies that were willing to take over the Dutch mining companies around the whole

country. In 1958, the Dutch company GMB was replaced by the new national state company PN Tambang Timah Belitung (Sangaji 2002). After that, the government canceled the mining rights of all Dutch's companies and individuals. These mining rights included survey permit, exploration permit, exploration and exploitation permit, exploitation concession and proposal for exploitation concession permit (Sangaji 2002)

Erman (2008) mentioned the monopolization of tin by the Indonesian government in the old regime through the establishment of the state-owned enterprise, controlled 522,460 hectares of tin mines with 114 mining permits both inland and offshore, covering Bangka Belitung Islands and Riau Islands. As a response, Erwiza (2007) mentioned that population responded to the state monopoly of mining and marketing tin after Indonesian independence by smuggling it to outside of Indonesia. The smuggling level reached its peak mainly during economic and political crises, especially during the time of the Indonesian Revolution (1945-1950), towards the end of the 1950s and onset of the 1960s (Erwiza, 2008). During the years of revolution, over ninety-percent of this island's economy was derived from the smuggling business. This regime system lasted until 1965 when the communist party incident took place and Suharto gradually took over the nation's leadership and officially installed as the second president of Republik of Indonesia on March 12th, 1967. This was the new beginning of the new regime era, Orde Baru or "New Order Era".

3.2.3 Tin Mining in New Order Regime

The New Order regime (1966−98) was the legal system for control over tin mining business. However, they did not undergo significant changes because state control of the tin industry had more strict rules and had more power. Erman (2008) further mentioned that like coal and oil, tin was also considered a strategic commodity that should be state-controlled, starting from the licensing process, through exploration and exploitation, up till marketing.

Singawinata (2007) argued that the Ordinance No. 1/1967 had been used by the Indonesian government since Soeharto's regime until now, was the legal principle for Indonesia in implementing a capitalist system by opening its doors widely to the massive foreign investment and allowing powerful business groups to monopolize some sectors of business legally. In relation to the above, Ibrahim (2016) more recently agreed and argues that law number 11 during the year of 1967 made tin mining a state of strategic commodities. As a further implication, tin was introduced and included within the state regulation domain, where the exports were controlled by the central governments. Strict state control was further clarified in the Governmental Ordinance (PP) No. 27 of 1980, stating that tin belongs to the group 'A' with the classification 'strategic'. Group 'A' mining products were under strict state control (Erman, 2008).

[4]Consequently, since new order regime only two enterprises, PT Timah and PT Koba Tin, had access to tin mining on the island of Bangka. They gave mining contracts to local domestic investors for the exploitation of tin in their licensed mining areas which were considered noneconomic or no longer productive (Erman, 2007). This was called Contract of Work Mines (Tambang Kontrak or Tambang Karya, TKK). This situation showed that global minerals extraction has been transformed from a rather fragmented industry characterized by small-scale operations to one dominated by a relatively concentrated group of transnational corporations (TNCs). During this period, large operations were known to be bound by having major impacts amongst people living in the vicinity. The most affected were the poorer, rural and most indigenous. The New Order state monopoly system of tin mining, along with military protection of the industry, seems not to have decreased the illegal economic activities in Bangka. Smuggling of tin became rampant at the onset of the 1970s (Erman, 2008). Almost everyone was involved in tin smuggling to meet their daily needs.

Erman (2008) narrated that during that time, one Butonese seafarer purposely came from Buton to Bangka to smuggle Bangka tin to Singapore. Between the 1970s and the 1980s, he smuggled tin more than 100 times. The Butonese seafarer argued it was a rational choice to smuggle in tin due to the force from the PT. Timah Tbk, military, and local officials also did the same for their own interests. Hence, the historical narrative above shows that smuggling of tin has been long embedded in the political-economic history of tin mining in Bangka. The smuggling activities that took place were not only a response towards mining and trading. It was also a strategy that helped the common people strive and survive in such a difficult time where political and economic crises were at its peak.

3.2.4 Tin Mining in Regional Autonomy Era

Within this sector the policies and regulatory frameworks also underwent considerable changes since 1998, this is largely due to Indonesian democratization, decentralization, and greater regional autonomy (Großmann et al., 2017). Indonesia embarked on its 'Big Bang' decentralization in the context of a significant economic and political transition, in which the tin resource governance regime shifted from state-centered to regional-centered control of natural resource utilization (Spiegel, 2012), and regional-level governments assumed responsibility for issuing mining permits. The Asian monetary crisis that had also played a part in causing major chaos to both the economy and the businesses in

[4] PT Timah (Persero) Tbk is a state-owned enterprise which is engaged in tin mining. Thereabouts 35% of its share is owned by the public which makes this company go public. This is in line with government objectives to make the company independent and transparent in performance. As the largest tin mining company in Indonesia as well as world largest exporter, PT Timah (Persero) Tbk having tin mining rights for 522,460 hectares by total numbers of 114 mining license both onshore and offshore with the area of operation covering Bangka Belitung Province and Riau Archipelago Province based on the existing of Indonesian Tin Belt. As a holding company, PT Timah (Persero) Tbk forming five subsidiaries and expand the business scope into many different fields among other things mining, engineering service, exploration service and dockyard and shipyard. This creates a unique, one-stop services, but also to keep offering the highest quality products and services. Moreover, PT Timah (Persero) Tbk is acting as an institution that formulating the corporate control, capital budgeting, and procurement, company financial management, and its subsidiaries formulate norms and values, determine the basic attitude of corporate business development both acquisitions and alliances

Indonesia during 1997, impacted on the mining sectors to remain as the consistent and significant contributor to Indonesia's domestic income (Singawinata, 2007) contributing 3.5 percent of GDP during the period of 1999-2003.

The implementation of a decentralized system which devolved significant power and authority to the regions under the new national system coined 'regional autonomy' (Tim Redaksi Kompas 1999b). Ordinance No. 22/1999 on regional government (and its subsequent revision – Ordinance No. 32/2004) and Ordinance No. 25/1999 on the fiscal balance between the central and regional governments (which was also revised and replaced by Law No. 33/2004) were enacted officially in January 2001. The promulgation of these laws signified Indonesia's entrance into a new era in which substantial powers, responsibilities and financial capacities are delegated from the central government to regional authorities, mostly to the Regency/municipal (Kabupaten/Kota) level. These laws to a significant extent allowed the regional authorities to autonomously govern and manage their own respective finances, political and administrative institutions and resources (Brodjonegoro 2002; World Bank 2003; Ahmad & Hofman 2000)).

Bangka had long been keen on regional autonomy and the new tin mining regime. However, the deregulation of the tin trade that accompanied the introduction of regional autonomy in January 2001 led to a new era in the history of Indonesia`s tin mining management. A set of demands was directed to central government and PT. Timah Tbk. The demands were to establish a province of Bangka Belitung, release Bangka from the domination of the people from South Sumatran province (Sakai, 2003), get ownership of a share in PT. Timah Bangka, replace the company's Director, a Javanese with a 'native son' (Putra Daerah). Bangka soon began to issue the district ordinances governing new tin mining management.

The region's response to the transfer of the authority for tin management from the center to the regions and its search for sources of regional revenue were both rapid and radica (Erman, 2007). Before 1999, the central government was strictly controlling the tin mining sector. After the issuance of law number 22, again in 1999, the central government handed over the rights and the authority to regional governments to use, to control and access tin resource (Ibrahim, 2016). With a meaningful shift in authority regarding the management and fiscal issues surrounding natural resources, the decentralization policy was expected to amount to significant changes in policy regarding the mining sector. Mining is vital to the living of some communities; thus, it is very important towards the development of regions especially within the decentralization era as well as the foreign investments sector. Some investors and business journals predicted that the decentralization and democratization of Indonesia would cause confusion, extra demands and a more difficult operating environment for multinational-backed mining ventures.

Later in 2001, Bangka regency issued Local Regulation number 6, this law allowed the local people to mine in peace. This led to the new tin mining management to contradict the past interpretations and

blame the legal and illegal among state actors from deregulation of the tin trade issued by decree of the Minister of Trade and Industry no. 146/1999 in 2001. Since then, the mining sector has been rapidly developed both by community's small-scale mining and large-scale corporations (Erman, E., 2007). It declared that tin was no longer considered a strategic commodity whose mining and trade had to be supervised by the central government. Based on regional autonomy law, the Regent of Bangka used his power, issuing District Regulation no. 21/2001 (8 May 2001) on the implementation of general mining in Bangka, and District Regulation no. 2/2001 (1 July 2001) permitting the export of tin sand and mining tin by locals

Besides the law 6, during 2009, law number 9 was also released. This law was regarding the mineral and coal resources and how they were managed. This was a law issued by the central government to control the extraction of Tin resource. One of the drawbacks of this law was that offshore tin mining by suction dredgers operated by private companies was legalized *(Ibrahim, 2016).* Suction vessels, commonly known as suction dredgers, are used for underwater excavation of an alluvial deposit and have definite negative environmental impacts such as sedimentation, the death of up to 30 percent of the local coral reef (within 1 year), water contamination, coastal erosion and noise, without proper mitigation and monitoring *(Prodjosumarno, 1993; Manap, 2008)*.

In 2013, the central government issued regulation obliging the exportation of tin ore to be monitored by the Ministry of Energy and Mineral Resources. Comparatively, there was not much of a difference from the previous regime period of government, the impact of regulation concerning tin ore export was also not significant in controlling illegal mining and smuggling issues (Ibrahim, 2016). In the other hand, decentralization imposed some negative consequences on the increasing conflict and threat of violence directed at public and private resource extraction companies, which was also expected as one consequence of decentralization (Vallez-Torres, 2014). Other sources note that the political changes amount to a long-awaited victory and hold much hope for the future of people and communities whose lives were affected by mineral extraction operations (Legowo & Takahashi 2003). The decentralization policy was expected to empower many of these communities who believed that the historical circumstances under which mining ventures gained control of their land were not in their favor, involved coercion and that they were never properly compensated for their loss of land and livelihoods.

During this period, the district regulation needed a closer look. It was the most important decision because it weakened the monopoly of the New Order regime and gave an opportunity to the population of Bangka to mine tin and sale it. The local government seized on tin deregulation as an opportunity to issue licenses, to regulate export, and to stipulate a decentralized management system (Erman, 2007). Looking at the findings based on the District Regulations, it is now possible for anyone to engage in tin mining or trade, whereas this was something much prohibited during the New Order regime. There were 21 local companies got permits from the Regent or the Mayor for their operation over there. An

estimated 130,000 informal miners called also as ‘informal mining’ (Tambang Unconventional) in 2002 were also active. By early 2004, the number of illegal miners had risen by 400 percent compared to the previous years. At the same time, the fall in the pepper price to below the cost of production (Rp 12,000 per kilogram) in early 2003 caused many residents to switch from pepper farming to tin mining. Erman (2008) emphasized that with mining, cash was available immediately, as soon as the tin sand was collected, unlike when cultivating pepper plants, which requires extraordinary patience

Furthermore, on this matter, many local companies that were founded after the setup of the district regulations had a mining authority but only on paper. They had no real rights or regulations. Their operations were also regarded as illegal because they bought tin sand from illegal miners and exported tin sand illegitimately. Informal miners were also termed illegal by the criticizers because they used modern equipment such as excavators, bulldozers and trucks, mined in prohibited areas, and neglected environmental impacts. The criticizers warned that the state had suffered losses of up to billions of rupiah, due to rampant and greedy illegal mining exploitation and tin sand exports. Therefore, they wanted Minister of Trade and Industry to withdraw deregulation of the tin sand trade.

On the 17th April 2002, a regulation prohibiting tin sand exports was issued by the Minister and came into force on 1 June 2002. According to the regulation, tin sand had to be smelted on the island or on smelted companies located in Indonesia. Supported by PT. Tambang Timah, Ministry of Mining and Energy and National Assembly (DPR-RI), the Governor also took a repressive control over illegal mining using modern equipment and mining in prohibited areas. Regulation and counter-regulation have been made to legalize the interest of parties involved. First, the ban on tin sand exports lasted only six months. The ban on tin exports met with resistance from the district head’s allies, who based their argument on issues of the ‘people’s economy’. The Regent was so powerful, and he made counter-regulation. In January 2003, the Regent issued Inter-Region Trading Licenses or SIPAD (Surat Izin Perdagangan Antar Daerah) through Regulation no. 20/2003. The intention of issuing the SIPAD was to reduce the amount of tin sand smuggling to Singapore and Malaysia. Basically, it gave tin sand exporters the opportunity to trade in tin between regions. They could send the tin sand to another region to be smelted. The SIPAD was manipulated by tin sand exporters by sending tin sand to cities such as Tanjung Pinang, Tanjung Periuk, and Surabaya. The tin sand was never smelted but smuggled from these harbors to outside Indonesia. Therefore, the SIPAD has, in turn, created a new conflict between the Regent and his allies with the Governor of Bangka Belitung and his allies. During October, in 2003, the issue of the Regent SIPAD was taken up at the provincial level, № 37, 2008 104 and a Special Committee on the Draft District Regulation on the Management of General Mining was set up, whereas, in January 2004, the regulation of the Management General Mining came into force. The regulation was more complex, regulating export taxes, exploitation, transportation, reclamation, smelting and trade in tin both within and between regencies

3.3 The Development of Large-Scale Coastal Mining

As has been revealed by several studies, tin mining has many stylized features: tin is extracted not only in open pit mines, but is also done offshore; again, tin mining industry is split into the formal and informal sectors, but the boundary between the two sectors is blurred. Mining that takes place offshore using suction dredger is expected to strongly increase in coming years as onshore tin deposits are dwindling. Hence, its prospects remain high due to the country's extensive mineral reserves and exploration activities. PT Timah, the state-owned-company has shifted their mining to onshore mining since 2006, though Coastal mining is not a new technique adopted. Report by ITRI (2016) shows that state-owned company, PT Timah, reserves in 2015 totaled 328,392 tonnes of tin, of which 276,772 tonnes (84 percent) are situated offshore.

Some seem to think coastal mining is the newly updated method of tin extraction. It is not since 1995 PT Timah has begun to run coastal mining by using bucket dredger. Until the mid-1980s, the main method of mining large placer tin deposits was by bucket ladder dredging. The alluvium containing the tin is excavated and transported by a continuous chain of buckets to the interior of the dredge where it is washed and roughly concentrated. In the last few years, smaller cutter-suction dredges have become widely used which are more maneuverable and produce a higher-grade concentrate on-boar. In the last few years, smaller cutter-suction dredges have become widely used which are more maneuverable and produce a higher grade, concentrate on-board (ITRI, 2016).

Whilst claiming all of the above it would be naïve to ignore that significant deposits of tin are known to also exist further offshore, but these have not proven to be amenable to the dredging method that has been so successful in the shallow waters over the last couple of decades. Several private Indonesian companies have been investigating whether borehole mining would be a practical and economically viable way of exploiting these deeper deposits cooperating with third parties (partners), PT. Timah operates around 38 dredging ships that have been increased to 70 ships in the last 10 years. These ships were previously used in Phuket, Thailand. This has caused widespread destruction of the marine environment to increase. There were 80 dredges and nearly 4000 floating tin mines off the shore of Bangka Island in 2013, and are up to 50,000 artisanal small-scale mines (ASM) and approximately 30 independent smelters. Tin production from ASM contributes up to 80% of Indonesian tin exports

Suction dredger operations in Indonesia had been undertaken by both domestic companies (state-owned and private) and multinational companies. However, coastal mining activities were mainly known for their deleterious effects on the environment, this all occurred due to the deposit of large volumes of waste. The mining activity decreases the environmental stability, causes pollution, and cause horizontal conflicts. Offshore mining reduced water quality, change sea bed caused the change of biodiversity. Similarly, Manap and Voulvolis (2015) found that suction dredging used for the underwater excavation of alluvial deposits is being conducted without proper mitigation and monitoring. After washing the tin, the dredgers release the sediment (known as tailings) which leaves a

cloud in the previously clear sea off the coast of the island. The spread of sediment from tailings disposal and the extent of the marine impact are determined by weather and dredge type; the spread of total suspended solids was recorded by the University of Bangka-Belitung to reach 5,000 square kilometers in the windy season.

Thus, tin ore exploitation caused a great deal of sedimentation and since waves move dynamically, this sedimentation had spread throughout the waters of Bangka and Belitung and the surrounding areas. Sedimentation is a cause of coral bleaching which results in the death of coral reefs. However, the water quality and coral reefs were the most important components of the coastal and marine ecosystem and are vital to the continuity of the chain or pyramid of marine life. Associated disruptions to marine ecosystems include oil spills, and oil or other chemicals, including waste of the products from the tin suction dredgers.

Research and observations conducted by the Coral Reef Exploration Team of the University of Bangka Belitung Islands proved that coral reef ecosystems on Bangka Island were not in good conditions. Conventionally, both damages at sea and at land are major causes. However, damage at sea is very difficult to control as it occurs through natural causes and the excavated holes beneath the sea are near enough impossible to control or prevent. Damage to ecosystems, especially coral reefs from offshore mining can only be explained scientifically.

The only Coral Reef that was in some sort of better condition was those from the main land far from the island of Bangka. The destruction is varied, ranging from the decline of living coral cover to accumulated severe sedimentation which causes loss to ecosystems. These activities kill up to 30 percent of the local coral reef per year, through water contamination, coastal erosion, and noise. More than 50 percent of coral reefs on Bangka Island have now been damaged. In addition, the Bangka Belitung University has reported that 18 out of 31 coral reefs were severely damaged by offshore tin-mining sediments from 2007 to 2011, and noted that the costs of recovering these reefs will greatly exceed the benefits that have already been derived (Ambalika, 2011).

Nurtjahya et.al. (2014) found that the offshore coastal tin mining reduced its water quality, proven by a 40% total soluble solid (TSS) increase, a 75% sedimentation rate increase, a 25% water pH decrease, and a 50 percent dissolved oxygen (DO) increase. In another study, Nurtjahya et.al. (2008) found that 40 percent reduction of the number plankton species occurred as the impact of offshore mining, in the other hand species of seagrass in mined water was about 70% of the number in less mined water. In addition, Nurtjahya et.al. study (2008) also found that the number of coral reef-associated fish in mined water was 30 percent of that in less mined water, while coral reef life coverage was less than 25 percent in mined water compared to more than 90 percent in less mined water. Similarly, another study in 2015 by Nurtjahya et.al., in three offshore mined sites found that small pelagic and demersal fish production decreased over the period 2009–2010 across the island, from 10 percent – 70 percent.

The mangrove ecosystem is known as one of the most important ecosystems in the coastal and marine areas, and not only has the coastal mining destructed the coral reef system but also the mangrove ecosystem. Ecology of the coastal areas and provide livelihood opportunities to the fishermen and pastoral families living in these areas. Mangroves also give indirect benefits through its impact on up gradation of the coastal and marine ecosystem. It is well known that coastal population succumbs to disasters of cyclones and Tsunamis, incurring heavy losses to their properties and livestock. Therefore, they are the main source of gross income generation for shoreline communities like fishermen. Mangrove ecosystem plays a crucial role in coastal conservation and provides livelihood supports to humans. It is seriously affected by the various climatic and anthropogenic induced changes. The continuous monitoring is imperative to protect this fragile ecosystem.

CHAPTER 4
LOCAL POLITICAL DYNAMICS OF COASTAL AND MARINE RESOURCE GOVERNANCE: A CASE STUDY OF TIN-MINING

Good governance means having good rules, strong oversight to enforce the rules, and the competence and willingness to follow them. Countries with the weakest resource governance are least likely to implement the rules they set

Institute of Resource Governance (2017)

Chapter four examines the factors that influenced local acceptance of suction dredging in a local coastal community in the Bangka Islands, and how this acceptance created a dilemma for the local fishers who were potentially impacted by this mining operation. Preliminary identification result shows that local community of Tanjung Gunung Village has never agreed or provided any social license to suction dredger operation within village territory. However, a paradox arose when for the first time, Tanjung Gunung gave their consent to approve suction dredger company social permit proposal in 2014. Thus, the reason and process behind the social license agreement become the major focus of this chapter. It further offers an in-depth understanding of local people's views on how and when suction dredging operations should be approved, or not, and how these views shape local mining permit decision-making processes.

4.1 Introduction

Coastal mining activities pose greater threats to the coastal and marine ecosystem, and livelihoods that are highly dependent on the availability of these resources particularly fishers whose lives depend on coastal and marine resource availability (Fanning et al., 2011). In the context of Bangka Island's, large-scale coastal suction dredging tin mining extraction has negatively influenced the livelihoods of coastal resource dependent communities (Muslih, 2014). It also consequently increased the likelihood of conflicts between fishers who work near the suction dredger operating areas and the suction dredging company (KIARA, 2013).

A press report by KIARA (2013) mentioned that the operation of more than 70 units of suction dredgers is threatening the livelihoods of 16,000 of the 45,000 fishers on Bangka Island. As a result, operational costs are increasing owing to longer fishing distances, which is time consuming and ultimately leading to a drastic reduction in the average income of fishers in Bangka Island by up to 80 %. Income ranges from 400,000 rupiah USD 25) per day to 1,000,000 rupiah (USD 60) per day per fisher, with an annual loss of approximately 15 billion rupiah. It creates serious conflict of interest issues between mining companies and potentially affected local communities, among which, fishers are

considered the most vulnerable (KIARA, 2013). One source of conflict was the local authority's prioritization of mining development in the area, and violations of the local mining licensing decision-making process.

Nonetheless, complexities associated with issuing mining permits cannot be separated from the power dynamic that links all stakeholders, including mining companies, governments, and the affected local community (Kemp, 2009). Hall et al. (2015), however, found that it was challenging to meet the demands and interests of multilevel stakeholders involved in the licensing of mining operations. Thus, the local resource governance framework's decision-making process for issuing permits becomes problematic. Previous studies done in Bangka's tin mining provide thoughtful insights over tin resource governance, by focusing on land tin mining, and how it affects locals' livelihoods, and few field-based social studies have focused on resource governance decision-making processes for approving mining permits (Li, 2002). However, limited study builds up their focus on the newly developing large-scale coastal tin mining operation. This study thus, examines the factors that influenced local acceptance of suction dredging in a local coastal community in the Bangka Islands, and how this acceptance created a dilemma for the local fishers who were potentially impacted by this mining operation.

4.2 Local Subsistence and Resource Utilization Dynamics

Community living in the coastal ecosystem has been exposed to environmental changes because of their dependence on coastal resources for daily subsistence, livelihoods, and related socio-cultural activity. Subsistence groups in Tanjung Gunung Village are divided into six categories: Net fishers, Bubu fishers, Seasonal fishers, Miners, Farmers, and Others (shopkeepers, village officials, and labor involved in tin mining). Net fishers include those who earn the largest portion of their income from fishing using nets. Bubu fishers use fish traps, called Bubu, made of wire, while miners who are part of a group of small-scale community coastal miners use pontoon units for mining extraction, and seasonal fishers choose the work they will do by season. The smallest household group is comprised of farmers, due to the limited availability of suitable land for agriculture. Other categories include civil servants, shopkeepers, and the laborers who help small-scale tin miners.

Local historical narratives explained by KJ (65 year-old-male) and TP (62 year-old-male) shows that Tanjung Gunung Village s' subsistence activities are strongly influenced by weather and seasonal conditions, resource availability, and ownership. When the weather is good, fishing activities run smoothly; when the weather is poor, fishers' activities are hampered. Likewise, fishers have different kinds of catches, depending on the weather, different catch volumes, and 95% of the fishers said they were now having more difficulties in predicting weather conditions.

Fishing tackle and boats are important assets in Tanjung Gunung Village. Most of the net fishers (87%) are small scale fishers who use a traditional tackle with limited boat size and engine capacity. They fish a relatively small area, and catch fewer fish, as well as fewer types of fish, compared to Bubu fishers, who have a lot of fishing tackle, bigger boats, and machines. Fishers who need assistance, have

to consult a *Fish Collector*, known as a *Boss*, either to get monetary help or to borrow boats and fishing instruments. This creates a social and economic patronage relationship between the boss and fishers. Most seasonal fishers (80%) are less dependent on their boss than the net fishers, of which almost half depend on *Fish Collectors*. In addition, the land is another resource needed for both commercial and daily fishers' subsistence. Most villagers who are net and seasonal fishers (77.14%) do not have their own land; 87.5% of the available land is used for agricultural purposes, and only 5.55% of the total land is protected from the tin-mining activity. Land ownership requires that they keep farming there, but the hilly land structure limits interest in agriculture, and capital shortages make them reluctant to own land.

A participatory survey of wealth showed that most net fishers have medium-low incomes, measured by five pre-identified wealth indicators: 1) housing type; 2) type of income; 3) amount of income; 4) debts; and 5). vehicle and home appliance ownership. Each indicator was scored from 1 to 5, according to a pre-identified local operational definition. All values were further calculated and ranked, before being categorized into three groups: 1) low: total score 5–11; 2) medium: total score: 12–18; 3) high: total score 19–25.

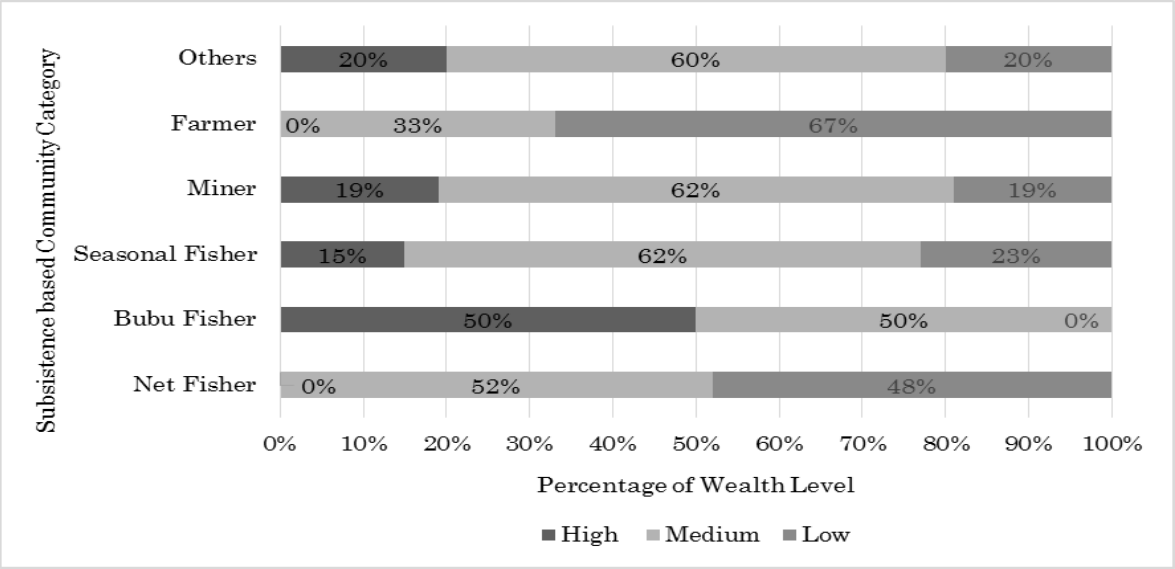

Figure 4. Tanjung-Gunung Village community members' incomes by occupations

Facing seasonal uncertainties, climate change, depleted resources, and degradation of environmental quality are caused by massive coastal mining development. people are being forced to manage their household incomes differently. About 60% of the local community has multiple income sources, and how they adapt depends on their household assets, skills, potential income, and preferences. The greater the assets available and the higher the income earned by the head of the household, the lower the likelihood that the household will have multiple income sources. The more skills household members have, the greater is the likelihood they will have another income source. However, the low literacy rate (63.3%) have not completed primary schooling also affects their livelihood strategies.

Community members regard the sea as a communal resource that provides them with an array of social and economic benefits, to which they all have rights of access. The sea provides habitat for marine and coastal life and has a reserve of the minerals from which tin is made. This mineral has been exploited by a state-owned enterprise under a government-issued license since the 1980s. Nonetheless, the escalation in mining by small-scale miners and large-scale enterprises coincides with the practice of other subsistence activities and may have long-term negative ecological and social consequences. Such are the concerns of 86% of the net and seasonal fishers, who are following the introduction of large-scale coastal suction dredging tin mining operations in neighboring villages, are catching fewer fish. To date, suction dredging has had a significant impact on the number and variety of fish caught and impacted fishers' incomes. As explained by SP, one of the net fishers (31-year-old male),

> *I used to get around 17.5 kg shrimp and fish, but now I get only get 2 kg of fish and 6 kg of shrimp per day, and sometimes I get nothing at all.*

Another net fisher, MF (53-year-old male), made the following observation:

> *I used to catch 5 to 10 kg shrimps but no longer do because the mud has covered 30 to 40 cm depth on the floor. If the government does not stop the operations of suction dredging, then please put some borders in the sea so that the mud does not bother our fishing activity.*

Therefore, local acceptance is mainly influenced by people's interests in the resources, how they will be impacted by suction dredging operations, and the benefits they will derive from suction dredging, including how local communities can develop a cooperative decision-making process for granting mining licenses to the suction dredging company.

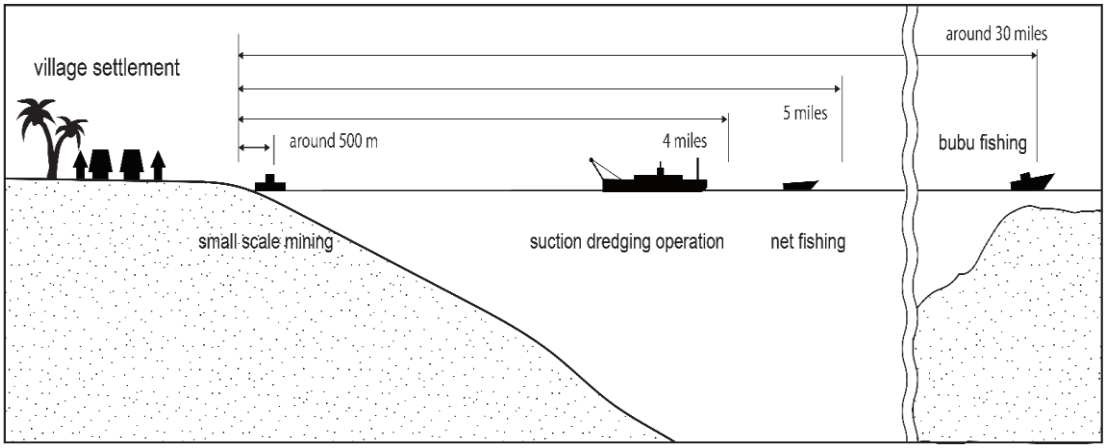

Figure 5. Local resource utilization sketch

Figure 5 shows the sketch that was identified to draw upon how local people utilize their resources. This sketch was created by using participatory approach involving community members from each subsistence groups. It is important to note that figure 2 depicts a community group's thoughts on creating separate working areas for each of the resource beneficiaries' village waters. Small-scale miners and fishers had conflicts because their workspaces overlapped, and both relied on marine and coastal life. To resolve their differences, they designated areas for small-scale mining operations and fishing grounds and agreed that miners could only operate within 500 meters of the shoreline, and fishing operations would be conducted between 0 and 5 miles from the shore.

Suction dredging in Tanjung Gunung Village creates a dilemma for the local community, whose members are competing for livelihoods while facing possible shortages due to resource exploitation. The net fishing area may be impacted by suction dredging waste, such as wood chunks, kaolin soil, oil leaks, and mud, which causes sedimentation and covers coral reefs. RM (52-year-old male), a net Fisher, said the locals believe that mining waste is moved by the wind and wave flow, that it will pollute the sea, and ultimately affect their yields.

In addition, suction dredging also limits when small-scale miners can use their resources since suction dredging areas overlap with the small-scale tin mining areas. Small-scale miners do not have legal permits, and so are threatened with expulsion. They may then be forced to find other mining grounds far from the village beach that will not disturb the fishing grounds. Bubu fishers' fishing grounds are relatively unaffected because they are removed from the suction dredging mining ground.

4.3 Decision-Making Process Behind Suction Dredging

Suction dredging was introduced to Tanjung Gunung Village gradually. Local communities maintain that they have inherited the local knowledge of the natural resources available in the region and that they have adapted this knowledge with new information about the importance of protecting the resources. As shown in Table *2*, however, in 2014, suction dredger companies expanded their businesses in Tanjung Gunung Village and the surrounding area, an area that is thought to have contained abundant tin resources. The community finally accepted the suction dredging company's proposal, with a number of conditions.

Table 2 Historical summary of suction dredging penetration in Tanjung-Gunung Village

Year	Events
2009	Suction dredging companies applied for exploration permit but were rejected
2010	January: Hundreds of Tanjung-Gunung Village community members, especially fishers, held a protest against the suction dredging operation
January 2014	January to February: The Tanjung-Gunung Village local community joined with neighboring villages' local communities to engage in another protest against suction dredging
June 2014	Mid-2014: Tanjung-Gunung Village backed accepting a submission for a suction dredging operating license
August 2014	Village government parties drafted an agreement and got approval from the local community in the form of signatures; more than two-thirds of the people who attended gave their agreement
October 2014	Suction dredging was planned to commence in Tanjung-Gunung Village and surrounding villages in early October

The community's internal decision-making process included several stages to consider each relevant party's negative and positive assessments. Two formal meetings were held to negotiate a mining permit for suction dredging operations. A public meeting finally decided to accept the company's presence, with several conditions. Figure 6 provides a flowchart of the licensing procedure. Community approval is one pre-condition for requesting a mining license from the government. After the company creates a file with the village government, the company and representatives of the state-owned enterprise lobby the government, and apply for a permit to conduct a pre-assessment.

The local government then considers the company's application, and the company is required to conduct a pre-assessment together with the village government of the local community's circumstances, which is used to determine the type and level of compensation. The company offered the following forms of compensation: 1) cash, given to locals as initial allowances for fishers and miners directly affected by mining activities, and for rural development; 2) fishing boat flows (paths constructed to protect fishing boats when the waves swell; once the water recedes, fishers do not have to walk 500 to 1000 meters to get to their boats); 3) land stripping, to peel a layer of soil from the bottom of the sea, to facilitate the process of soil suction that will help small-scale miners; and 4) suction dredger tailings mining waste that still contains tin, which can be re-extracted are given to the community to sell to the suction dredging company.

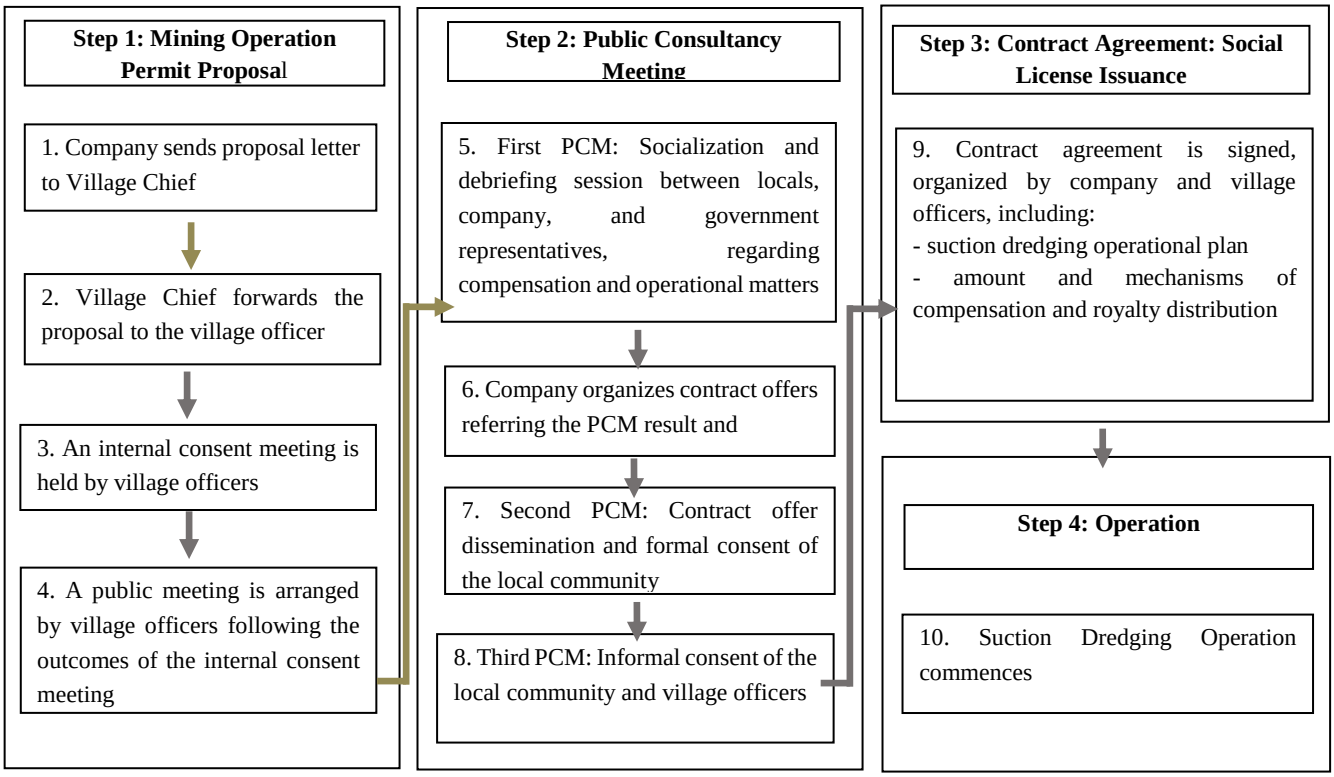

Figure 6. Flowchart of mining licensing procedure

The local government is then responsible for relaying information between external and internal stakeholders. The lobbying occurs in several stages, according to the amount of time allotted to discussions by the parties. Once community level agreement has been obtained, this information is communicated to the company and the regional and provincial levels of government. Suction dredging operations begin after all the parties have agreed to all the conditions. Prior to that, the community has given its final agreement to the social permit at another meeting. The local community's signatures are required to verify that it has approved the agreement before the regional government will authorize a formal mining permit.

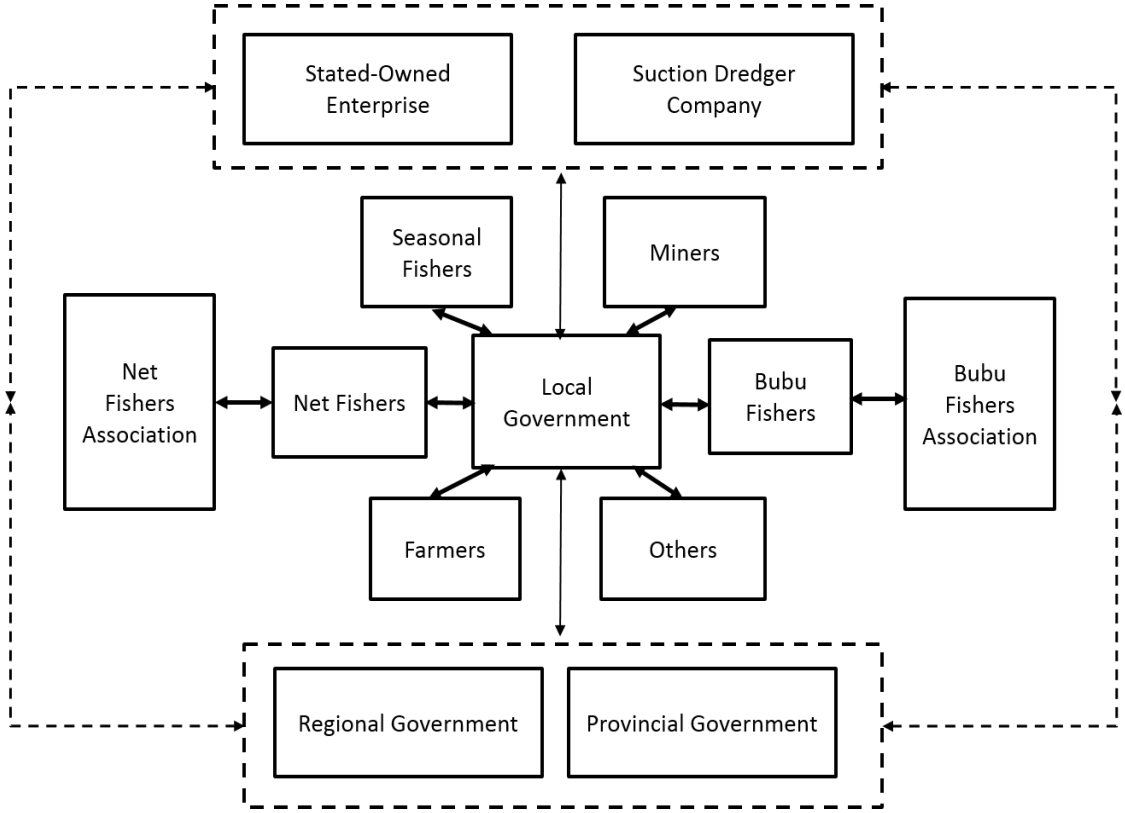

Figure 7. Stakeholders involved in mining license issuance

Figure *7* depicts the relationships between all the parties that are supposed to be involved in the decision-making process. The local and regional governments bridge communications between the company and the community. Power relations internal to the decision-making process describe the local political situation in Tanjung Gunung Village. This process involves several stages and includes each relevant party's negative and positive considerations. Community and local government representatives have several meetings in an effort to reach consensus. The local government accommodates meetings that involve various societal elements. Up to three meetings were held to negotiate the mining permit for suction dredging. From the first to the third public meeting, the net fishers' attendance declined from 64 to 26 % of the total net fishers. Meanwhile, Bubu fishers and miners' attendance was relatively stable at between 60 to 75 %. There was no significant change for farmers and other categories, who had a relatively low attendance (less than 10 per cent). At the first public meeting, less than 10% of respondents who attended the public meeting gave their opinions. They preferred to listen to the information given by village officers and the company. During the second and third public meetings, this number increased but was still low, and less than 20 per cent were willing to talk.

4.4 Attitude of Local People Towards Suction Dredging

The application process requesting community approval was conducted in the local political arena and involved multiple parties with different degrees of power and knowledge until it finally entered the decision-making process. Nevertheless, locals offered different responses to suction dredging, as shown in Figure 8.

Most of the locals, and especially Bubu fishers (80%) agreed to allow suction dredging operations, while those who disagreed most were net fishers. Seasonal fishers and miners largely agreed (more than 60%). Net fishers, in comparison, disagreed (40%), with five of them objecting to possible future impacts, two to the imbalance in benefits and costs, and three who objected to consideration of their family and descendants' future. Bubu fishers were the smallest proportion (10%) of the local community to disagree with suction dredging.

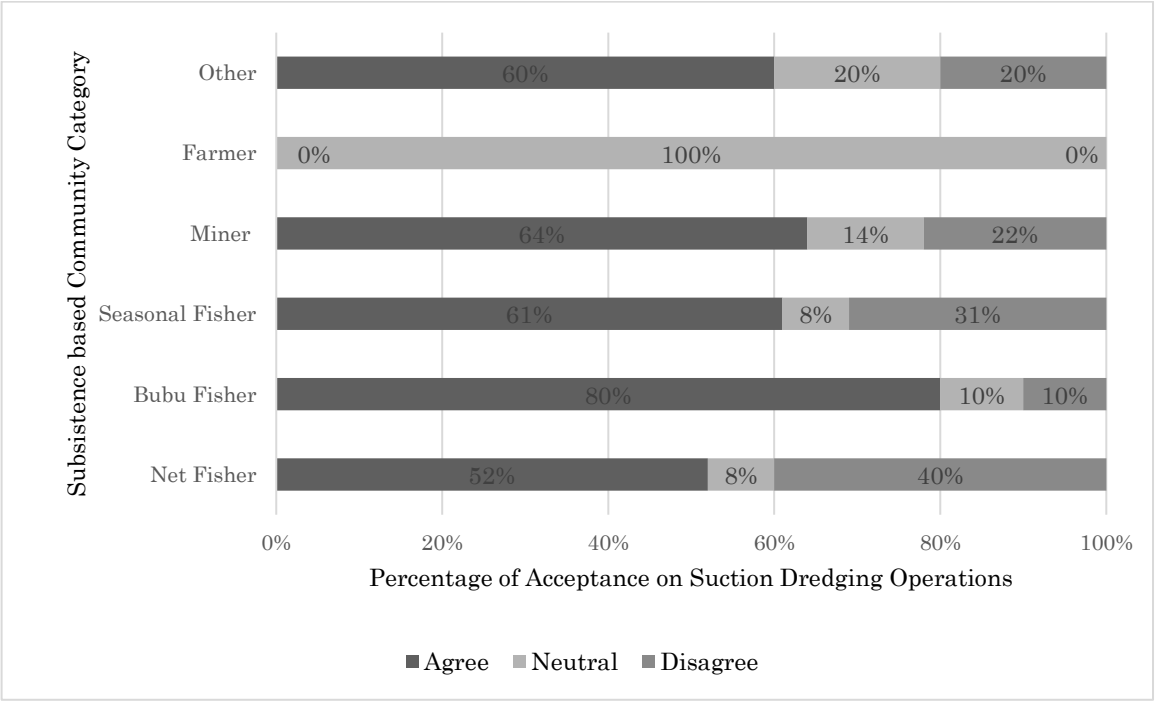

Figure 8 Community perspectives on suction dredging operation

The household survey also revealed that local farmers had a neutral attitude because their economic activity is unrelated to suction dredging. During the household survey, I found that three net fishers regretted their decision to agree to the suction dredging operation, but had agreed due to certain factors. KH (32-year-old male) said,

> *Because of the previous suction dredging, my income decreased by 75 per cent because it's getting so difficult to get fish. How can I agree after seeing this condition? When I visited the village office, the village chief told me that the suction dredging will go on with or without my agreement.*

Another net fisher, SP (48-year-old male) said,

> *Yes, I was also with him at that time. And the village government suggested me to agree because if I agree I would be compensated and if don't, I will not receive any compensation. Therefore, at that time, I thought to sign it, because they will operate even if I did not sign.*

Even if they did not agree, these men were encouraged to approve it. Another net fisher, DD (44-year-old male) said,

> *At first, I also thought to disagree, but because my friends had agreed, I decided to agree. Even if I had not agreed, I wouldn't have been able to do anything. I was worried that in the case of disagreement, something could happen to me.*

This view explains the decision to agree since his friends had agreed. In addition, there is a feeling of insecurity. However, some simply rejected the proposal in the beginning and were not willing to sign. SD (43-year-old male) said,

> *The sea is my livelihood and source of income for the family. The income the sea gives me is the fortune that I have received from the Lord. My parents, who used to be fishers, always taught me to keep these principles. I would not willingly give my sea away, so let me stay with this rebel silent who cannot afford, but my little heart was crying, and I did not wish to approve it.*

The minority did not express this attitude in public meetings, which should have provided a forum for them to express such views. SD prefers to shut his mouth and keep his distance from the supporting parties. One of the net fishers, UD (48-year-old male), in a pre-assessment in February 2014 said that he rejected the proposal due to the severity of the suction dredging operations, but when I met him in August 2015, he expressed a different opinion. He said:

> *I am aware that the suction operation is going to be a big threat to me and others, especially net fishers. But, personally, I am concerned about the long-term impact on our livelihood. After I reconsidered the economic benefits for our village, why do we not give them the opportunity to contribute to developing our village? Moreover, as I am a village office representative I should always*

support the government's positive plan.

This statement reveals another reason the net fishers agreed. The Village Chief was functioning as a bridge between local community members and the suction dredging company. He had a personal influence on the people in his social circle. Local communities tend not to agree, but then they are not able to refuse, because of the personal burden it places on village officers. In the case of miners, of the nine miners who agreed to the suction dredging operation, five of them said they agreed because of the compensation provided, even though personally they were worried about the diminishing area available for their small-scale mining, while four other miners said they agreed because they were following the majority. Other miners, who agreed the statement, tried to influence and convince those who disagreed.

Household surveys show that 72% of the 18 net fishers who agreed with the suction dredging operation personally disagreed, but finally agreed; 46 per cent agreed because of the compensation; 38 per cent were influenced to support it by their relatives and bosses. Finally, 16 per cent agreed because they felt insecure. ZB (62-year-old male), a Bubu Fisher's Association representative who tended to be neutral when interviewed at his house, explained his support as follows:

The presence of a suction dredger will provide positive impacts for the Tanjung Gunung Village rural development, and Central Bangka District in general. I strongly agree and, as chief of the Fisher's Association, I have made efforts to socialize within my community group which urged fishermen to help provide support for this for the good of us all. Moreover, net fishers in general and other Bubu fishers are having the same trouble due to the huge and strong waves that hit our boats. If the company will build a fishing boat flow for us, it means I can bring my boat to the village beach without any worries.

In a separate interview, ZB did not seem to reject suction dredging. For Bubu fishers, if suction dredgers do not interfere, it will not be a problem. This is similar to arguments by farmers and other local communities. Confirming the participation of certain stakeholders in decision-making processes requires courage, to confirm and re-confirm, because different times and settings can influence their thinking, and so the decision-making process. Given their limitations, and realizing their inability to withstand the majority, net fishers who disagreed tended to remain silent, and not be confrontational.

Different groups have different attitudes towards the proposal, and its potential costs and benefits are a key factor. Forty per cent of net fishers consider new money which is one of the most important potential benefits, while only 16% of them thought that suction dredger tailings would give them an alternative source of income. Fishers who considered potential benefits as being unimportant assumed that these benefits were temporary, and observed that they needed marine resources for their future sustainability. DD (41-year-old male), a net fisher, said,

Compensation money is temporary. It's just a limited amount of money. Just imagine, after they finish their operations. How would I feed my family? What will my kids eat?

ZB (45-year-old male), one of the Bubu fishers, said Bubu fishers, and especially those who operate offshore, will not have a direct impact on suction dredging. Based on household surveys, 87 per cent of them believe that those benefits are very important; especially with regard to the fishing boat flow, which is important to them. This is not consistent with what the farmers said because farming activities do not overlap with the suction dredging. Therefore, farmers tended not to get involved. As IB (56-year-old male), a farmer said,

I just heard about the issue of compensation, but I do not know anything and do not want to get involved. Moreover, I live here (Binjai), far from the mining location, so it's up to other people. I have no idea about that.

BD (49-year-old female), a shop owner, said,

If suction dredging operates in TanjungGunung Village, it will have a positive influence and our economy here will run more smoothly. This will affect the development of my business.

In general, suction dredging brings different multiplier effects to both the communities who are directly related to it and those who are not. Tanjung Gunung Village had several times been affected by suction dredging operations in the neighboring villages. As observed by 78 per cent of the respondents, this affects the local community's economic activity, and particularly those who intersect directly with the suction dredging operating region. According to household interviews, the mining activity impacts that are significant to their economic activities include the destruction of coral reef, mining waste (oil, mud, kaolin wood), limited small-scale mining grounds, and decreased fishing grounds.

Results of the household survey show that net fishers must bear the most severe impacts of mining activities, and more than 80% of them considered the destruction of coral reefs, mining waste impacts, and decreasing fishing grounds to be the cost of suction dredging operations. Miners consider the impacts on their mining grounds, as did some Bubu fishers, who were part owners of mining units. Massive destruction of the coastal environment may also have direct negative effects on the livelihoods of the adjacent population. Their biggest concerns are social conflicts, pollution, land degradation, and deforestation. Hence, mining activities inflict serious negative consequences on the lives of local communities and the nation at large.

4.5 Discussion

The issuance of 'tin-mining licenses' in Tanjung Gunung Village was used to interpret how governance arrangements, and the environmental and social impacts of Coastal Suction Dredger Tin Mining Operation, are compelling those who really agree, those who disagree, and those who disagree, but have to agree, to speak with one voice and give their permission to conduct dredging operations. Local politics should ensure all stakeholders have equal influence in decision-making processes. Otherwise, the process will negatively impact the minority that will feel their rights and obligations are being violated and set the stage for future conflicts. The two main discussion points that will be addressed in this section are (1). Factors that influence local acceptance of suction dredging, and (2). How the absence of a mature democratic system influences local decision making on the issuance of mining permits.

4.5.1 Factors Influencing Local Acceptance of Suction Dredging

The mining company knew that acquiring the social license was necessary to allow its operations to continue without community conflict (Prno and Slocombe, 2012). For locals, the granting of a social license often implies that they have been meaningfully involved in the decision making, and have received sufficient benefits (Prno, 2013). This discrepancy often leads to conflicts of interest when a mining company fails to meet societal expectations, particularly for the most vulnerable locals potentially impacted by mining operations (Hamann, 2003). Therefore, a key to mining permit issuance by communities is the belief that the social, environmental, and economic benefits of a project outweigh its potential impacts.

Suction dredging will potentially affect both the communities who are directly connected to it and those who are indirectly connected to it. Both experience with different levels of impact (positive or negative). Bubu fishers are regarded as the biggest beneficiaries, because they can receive all the benefits, including new money, or other compensation. Bubu fishers operate separately, 30 miles away from the village beach. Their distribution and storage of fish are conducted in the largest port in the provincial capital. Therefore, suction dredging will have no direct effect on their fishing activity, and they do not have to worry about the direct threat of resource depletion.

Net fishers, however, have to accept a resource depletion threat that will have a significant impact on their daily income, because they will catch fewer fish. The declining fish population will force them to extend the distance they have to travel to fish, and these distances are not compatible with the capacity of their boat engines, and their limited daily capital. ZT (a 58-year-old male) said that net fishers' operating costs are increasing due to increasing travel costs and time needed to fish, and they are experiencing up to 75% reductions in their average incomes. Most fishers understand and recognize these threats. Asset ownership (such as land, vehicles, and other productive assets) and financial levels (including savings), will make it easier for them to find alternative livelihoods if fishing income drops.

Miners will continue to have the same access to diverse employment opportunities since most of them are at a productive young age and have good educational backgrounds. Thus, they might exchange their wage labor for other skilled jobs. Net fishers are older, have limited assets, and fewer skills, so they are less likely to find alternative livelihood sources. Bubu fishers can enjoy the benefits of permitting the suction dredging company to operate, without having to pay a high cost or sacrifice their own economic activities.

The suction dredging company and state-owned enterprise are the external bodies, while miners and fishers are the internal bodies who are dependent on the coastal and marine resources. Local and district governments are responsible for facilitating information-sharing between both of these bodies. Of all the categories, fishers (Net, Bubu in particular, and seasonal fishers) and miners are considered as being the key stakeholders. Tables 4.2. and 4.3. show the driving and inhibiting factors in each community's categories. I exclude farmers and others, considering their neutral attitudes. Driving factors trigger acceptance of the suction dredging operations while inhibiting factors are those that deter acceptance of these operations. If the economic driving factor is greater than the inhibiting factor, the community will tend to give consent to the suction dredging operation.

Table 3 Economic factors that influenced the community's acceptance

Factors	Net Fisher		Seasonal Fisher		*Bubu* Fisher		Miner	
	Driving Factors	Inhibiting Factors	Driving Factors	Inhibiting Factors	Driving Factors	Inhibiting Factors	Driving Factors	Inhibiting Factors
Cash	+		+		+		+	
Boat Flow	+		+		+		+	
Mining Tailings	+		+		+		+	
Stripped Land		+		+	+		+	
Alternative Livelihood Sources		+		+	+			+
Resources Depletion		+		+	+			+

Monetary compensation was the reason the majority accepted the proposal. It pushed net fishers to agree on the mining permit. Both cash and tailing wastes are a source of additional income for them. Fishers in general, including net fishers, Bubu fishers, and seasonal fishers, are thought to have equal rights to compensation and revenues, while miners were focusing on a land stripping project. The suction dredging company offered respondents a variety of economic considerations in terms of compensation and revenue.

Socio-political driving factors also influenced the local community's agreement or disagreement (Kuehnast et al., 2008). When an inhibiting factor is higher, the local community will

tend to reject the operation. Practically, however, economic driving forces are not the only factor influencing the local community's decision making. Outside pressures were another reason for their acceptance. Other fishers' moral burden and insecure feelings also led them to accept the proposal.

Table 4 Social factors that influenced the community's acceptance

Factors	Net Fisher		Seasonal Fisher		Bubu Fisher		Miner	
	Driving Factors	Inhibiting Factors	Driving Factors	Inhibiting Factors	Driving Factors	Inhibiting Factors	Driving Factors	Inhibiting Factors
Personal Relationship with Local Figure	+		+		+		+	
Knowledge on Suction Dredging Impacts		+		+	+			+
Access and Capability to Raise Voice		+		+	+			+
Insecurity	+		+		+		+	
Outside Political Pressure	+		+		+		+	

Most members of the Tanjung Gunung Village community are hereditarily connected through family relationships. Social relationships and networks, based on kin, economic, political, and/or other types of 'personal' connections 'are the fabric of everyday life, facilitating day-to-day activities' (Sick, 2008). This impacts decision making indirectly, since when a relative or family member works as a village officer, other family members are reluctant to take decisions against them. HG (45-year-old) also mentioned that the Tanjung Gunung Village community has an Eastern culture that tends to avoid taking risks. Even though they understand and have sufficient knowledge of the impacts of suction dredging operations, they are not capable of expressing their disagreement, especially among net fishers. Even if a decision is contrary to their circle's majority opinion, they will tend to agree publicly, though they do not personally agree. Their views on suction dredging reveal that political influence on progress is becoming one of the important factors to influence their decisions. This suggests that the written agreement confirming the local people's full agreement with the suction dredging operation is no guarantee that the stakeholders personally agree with it.

4.5.2 Immature Democratic Process

Obtaining a social license before conducting tin mining activity is inherent to a democratic system framework. To avoid conflicts of interest, a fair decision-making process should seriously consider both justice and equity in terms of all stakeholders. Agreement on revenues, the distribution of compensation, and the assignment of social and environmental responsibilities should include all parties equally.

The local community was involved in the decision-making process through public meetings. As mentioned previously, only the attendance of net fishers declined. One of them was influenced by a village officer's invitation, which involved having of a village officer which can give explicit instructions to hamlet chiefs who passed it on to a sub-hamlet chief. Thus, hamlet and sub-hamlet chiefs are thought to understand their community's alignment. One of three hamlet chiefs stated that he had been instructed by the village officer to limit the number of people invited, and tell sub-hamlet chiefs to prioritize the locals who would likely agree. Members of the local community who were likely to disagree were not prioritized in terms of invitations. Public meetings should allow all stakeholders to express their ideas, aspirations, and opinions freely. Limited opportunities and feelings of worry and lack of confidence were reasons for the low participation of attendees during public meetings.

Though, the local license was ultimately time- and context-specific, and thus reflected local social, economic, and environmental conditions, community priorities, capacities, and expectations will vary depending on the setting (Prno, 2013). Furthermore, mining companies can rarely point to a document that confirms that a license has been issued (Prno and Slocombe, 2012). However, from a democratic standpoint, decision making should involve all elements of society, and consider the potential impacts on all stakeholders. Thus, people such as net fishers, who will be more impacted by suction dredging activities, should be given special attention and genuinely involved in the decision-making process. Offshore mining activities, either by suction dredger or small miners in Tanjung Gunung Village waters, definitely affect the marine ecosystem, which is also a source of livelihood for locals. Thus, some parties will experience immediate direct and indirect impacts at both high and low levels. Therefore, all parties have equal rights to be involved in decision-making processes

Tanjung Gunung Villagers were classified as those who could participate actively in the decision-making process, and those who were considered passive and preferred to follow the majority voice. The elite segment of the population, which included the village officer, and other beneficiaries, were taken into confidence because they shared the suction dredging mining company's interests. Meanwhile, the net fishers who were the ones most affected faced a dilemma. Most of them were opposed to suction dredging because they knew it would greatly affect their economic activities in the present and the future. However, the local political system forced them to agree, and the influences exerted by other parties, and their own insecurity, further pressured them to accept the suction dredgers. As a result, they will have to sacrifice their rights of access and their control of natural resources, and find themselves further marginalized (Robbins, 2012).

Their agreement on suction dredging operations allows them to keep their motives hidden. Those who totally disagree with the operation cannot express their opinions, because of pressure exerted by other elite stakeholders, and their lack of confidence as minorities. Even if they cast their vote against the proposal, the licensing process will not be affected, because they are a minority. Thus, they are

indifferent to express their opinion on suction dredging and accept the operation to obtain compensation. [5]The immature democratic process creates conditions that trigger this marginalization. Public involvement should act as a medium to accommodate all stakeholders' views, but the local level cannot accommodate their interests because some local elites in effect have control over the decision-making process for mining permits. Immature democratic processes occur when decisions are made without fully consulting all stakeholders, or fully considering the whole village's views. The result is unsuccessful democratization that will possibly lead to a rebellion by unsatisfied stakeholders.

4.6 Conclusions and Research Implications

Net fishers who are ecologically marginalized are facing a paradoxical situation in which the majority disagrees with suction dredging, but the local political system forces them to accept it. This study found that economic and local socio-political factors influenced the acceptance of suction dredging by the local community. Compensation and alternative income sources were the compelling reasons that pressured the villagers to agree to the issue mining licenses, while resource depletion and deterioration, reduction in fish prices, and difficulties finding alternative livelihoods were the key reasons for rejecting suction dredging. The absence of a fair decision-making system highlights the urgency of improving information disclosures by the government, locals, and companies, and thereby creating a forum in which decision makers can convey their ideas and make fair decisions. To reach these goals, further research is needed to design decision-making processes that impartially consider positive and negative impacts, and consider proposals' strengths and weaknesses from each stakeholder's perspective.

4.7 Post Research Period Follow-up

This study was conducted until the social permit was agreed and issued by Tanjung Gunung Community. However, according to the results of a follow-up interview one month after the start of the suction dredger operation, HD (35) one of the village officer stated that the suction dredging operation lasted only for two weeks. Net fisher who were feeling oppressed by the local government and the locals who support suction dredger company, then further gathered power by asking for help from other villages' net fishers. It cannot be denied that the impacts caused by suction dredger operating in Tanjung Gunung were also greatly felt by other villagers. Clarified by KJ (45-year-old man), one of the local net fishers, many complain regarding income depletion expressed few days after the beginning of the operation, not only by net fishers from Tanjung Gunung but also from other villages. The net fishers group then tried to deliver the complaint to the local government, but no proper response was given by local government officer. Being more oppressed because the absence of proper platform which can

[5] Immature democratic process refers to the failed democratization within social permit issuance, characterized by the absence of a fair decision-making system that marginalize the interest of minority interest (in this case, vulnerable net fishers) and privileging the majority interest.

accommodate them complain, Tanjung Gunung net fisher group then further initiated to gather power with other net fisher groups from several neighboring villages. Demonstration and blockade on the beach of Tanjung Gunung in mid-December 2014 becomes the peak of the tensions. Net fishers strongly condemn the activity of the suction dredging activity and demand the dismissal of suction dredger operations. Finally, demonstrations can halt eventually after the government declares a dismissal. This situation reflects the emergence of rebellion as the result of unsuccessful democratization.

CHAPTER 5
MARGINALIZATION OF A COASTAL RESOURCE-DEPENDENT COMMUNITY IN TIN-MINING PRODUCING REGION

When governments and private sector companies agree to exploit publicly held natural resources, citizens have the right to know the terms of the resulting deals. These terms are contained in licenses, contracts, regulations, and legislation. While regulations and legislation are usually public, licenses and contracts are not

(Institute of Resource Governance, 2017)

As per the previous discussion in the previous chapters that many rural people in Bangka Island greatly depend on tin mining. However, it is undeniable able that penetration of large-scale mining using suction dredgers has also affected the livelihoods of many people who depend their living on the coastal resource. In the previous case study exposed in chapter four, I have discussed the dynamic of coastal tin mining governance in the early suction dredging operation region which previously has never issued a social permit to suction dredging company. The case study discussed in chapter four successfully depicted that unsuccessful democratization process embedded within decision-making process over resource system will potentially marginalize the local community. This finding reflects that the decision-making process within the local resource governance framework in issuing mining permits becomes problematic when considering locals' interests and their dependency on coastal and marine resources, which can be impacted by destructive large-scale mining. Therefore, in Chapter five, I seek to explore the second case study in the other tin-producing region that has been experiencing suction dredging operation for more than four years in their region. This chapter explores the way through which the decision-making process has been taken by the local people to issue social licenses for large-scale coastal tin mining in Bangka Island. Next, I explore how such decision-making process impacts people's livelihoods through intensive household surveys, in-depth interviews, and an empirical analysis. Lastly, I close my discussion by providing several implications for local decision-making on tin mining large-scale coastal mining operations.

5.1 Introduction

In Indonesia, issuing licenses for tin extraction is authorized by state regulations and policies pertaining to sea mining activities, including Decree No. 4 of 2009 (Minerals and Coal) (Mujiyanto and Tiess, 2013), Decree No. 27 of 2007 (Management of Small Islands and Coastal Resources) (Siry, 2011), and Decree No. 32 of 2009 (Protection and Management of the Environment) (Campbell et al., 2012). According to the aforementioned regulations, all mining companies are required to conduct environmental feasibility studies and environmental impact assessments (EIAs) and to pay royalties. A

shift from a centralized to a decentralized government encouraged district-level governments to draft their own rules governing natural resources, giving district heads the authority to issue permits for Suction Dredger operations. Nevertheless, full legal compliance with state environmental regulations has thus become an increasingly insufficient means of satisfying society's expectations with regard to mining issues (Prno and Slocombe, 2012).

Previous research has shown that there is a growing recognition within the extractive sector of the importance of obtaining approval from the local community before conducting activities (Franks et al., 2014). Similarly, a study by Lesser et al. (2017) highlighted the significant role of the local community in Finnish Lapland regarding the issuance of social licenses. Both studies demonstrate the widespread recognition of the local approval, commonly known as social license as a community's ongoing acceptance of a company's operations in their area. In parallel with the emergence of the social license, Prno and Slocombe (2012) recognized two different perspectives on the importance of such a license. For mining companies, it reduces social risk and facilitates operations without community conflict, and for local communities, it often implies that they have been meaningfully involved in decision-making and have received sufficient benefits from the project. As Hitch and Fidler (2007) suggested, communities recognize their rights to local resources as a critical way to end dependency and regain control over their livelihoods. This can result in conflicting interests between different stakeholder groups, which mean that the satisfaction of one stakeholder group may be at the expense of another group's well-being. Furthermore, Lesser et al. (2017) also emphasized the urgency of developing social licensing procedures to safeguard the local community, which in particular, may be adversely affected but is not considered a majority voice. Such procedures would encompass the idea of public participation in the decision-making process of issuing social licenses.

This chapter is organized as follows. First, I look into the local subsistence dynamics and the historical overview large-scale coastal suction dredging tin mining operations. Then, I describe how local people perceive the benefits and its impacts of large-scale coastal suction dredging tin mining operations and how it causes locals to shift their attitudes toward mining operations. Subsequently, I investigate decision-making processes by describing how large-scale coastal suction dredging tin mining operation licenses are issued, the roles and responsibilities of the actors involved and the distribution of compensation and royalties by the Suction Dredger company. Finally, I suggest several important points that should be considered to make fair and just decisions on tin mining.

5.2 The History of Large-Scale Coastal Suction Dredging Tin Mining Penetration in Selindung Hamlet

Unlike other hamlets, mining activities in Selindung Hamlet began in early 2002. Numerous small-scale mines, commonly called 'unconventional mines' emerged and were supported by outside investors. This shifted the mode of production to capital-oriented, small-scale mining activities, followed by large-scale tin extraction using Suction Dredger, which unofficially has been begun in 2009

without formal consent from the local and regional government and reduced the number of locals who were engaged in small-scale tin mining (see Table 5).

Table 5 Historical Trajectory of Suction Dredger Operations

Year	***Important Event***
2002	Beginning of small-scale land mining by locals. Shift in local subsistence from farming and fishing to small-scale tin mining, which changed the social and economic function of the land.
2004	Peak of small-scale land mining and the emergence of small-scale coastal mining. Local economy was boosted followed by rapid land conversion and a massive influx of seasonal migrants.
2009	Unofficial beginning of Suction Dredger operations along with depletion of small-scale land mining, gradually pushing locals to find alternative livelihood sources.
2011	The first Public Consultancy Meeting (PCM)
2014	Suction Dredging operations stopped due to border conflicts between neighboring villages
2015	Victory in the first court case. Selindung Hamlet and Air Putih Village have the right to utilize and control the previously conflicted area.
2016	Loss in the second court case. Suction Dredger commences, organized by a neighboring village.

Source: In-depth Interview, 2016.

Suction Dredger operations lasted for approximately two years until the end of 2010. During this period, Suction Dredgers extracted tin resources in an unsustainable manner. At the beginning of the March 2011 (known locally as the east wind season), Suction Dredger companies obtained official permission from the district government along with local consent. In 2014, Suction Dredger activity has been stopped due to a border conflict over an ambiguity on the official village map. The conflict is concerned regarding the right of access and ownership of the coastal area and who was eligible to receive royalties and compensation from Suction Dredging activities, as well as who would receive compensation and royalty shares for authorizing small-scale mining activity.

In the early stage of operation, most of the villagers agreed to Suction Dredging operations (95%) due to the economic benefits offered by the company and the provision of services such as the construction of new roads, bridges and a mosque; electricity; and vehicles for community use. As illustrated in Figure 9, there were significant changes during the research period (2015) in the community's response to Suction Dredger operations. Along with the rapid depletion of fishing yields and fluctuation of fish prices, the majority of villagers rejected Suction Dredger operations (43%) as they began to realize that Suction Dredgers raise more harm than good, both individually and to the community as a whole.

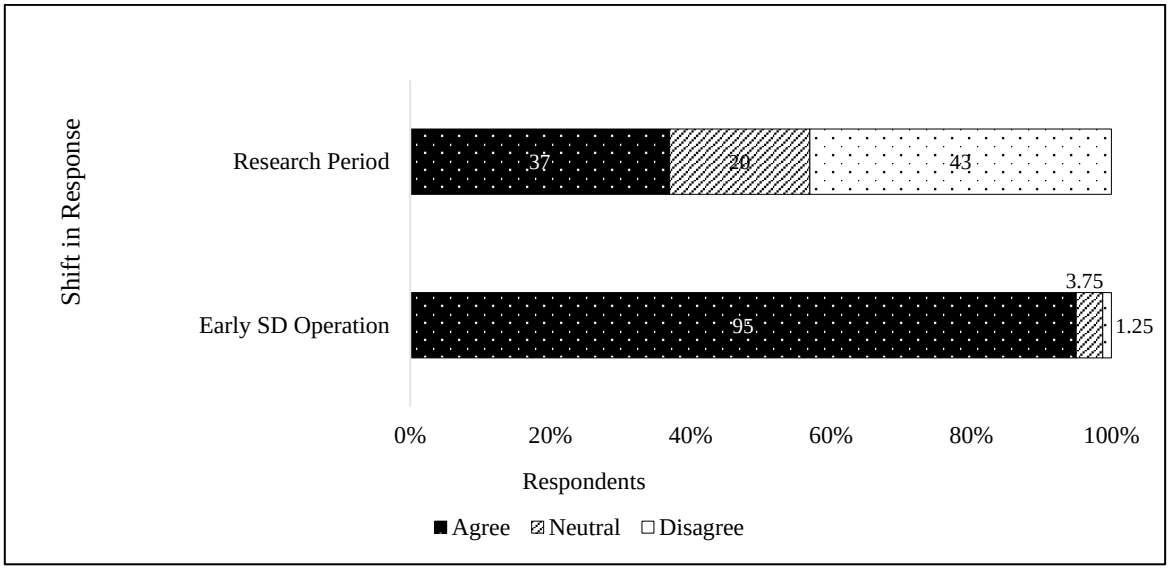

Figure 9 Community Agreement/Disagreement on SD Operations
Source: Household Survey, 2016.

One local fisher, TH (42 years old), stated: 'Previously, locals were told that suction dredger's operations would not disturb fisher activities. However, with the increase in the number of suction dredgers, fishing grounds became scarce, resulting in drastic income depletion.'

Similarly, another local fisher, YT (35 years old), emphasized:

> *Before suction dredger operations, we were able to buy fish within our neighborhoods at cheap prices and due to the abundance, occasionally were offered to take fish for free. Currently, it is hard to even buy fish within the village and prices are higher.*

Locals are currently polarized in the following groups based on their attitudes towards Suction Dredgers operations: the Disagree Group, the Agree Group, and the Neutral Group. Their attitudes are influenced by several factors and conditions. The Agree Group consists of locals who agree with and support Suction Dredgers operations, while the Disagree Group consists of locals who do not approve of or support Suction Dredgers operations. The Neutral Group consists of people who tend not to reveal their attitudes, whether they agree or not. Most of those in the Disagree Group are community fishers while the majority of the Agree Group consists of miners (see Figure 10).

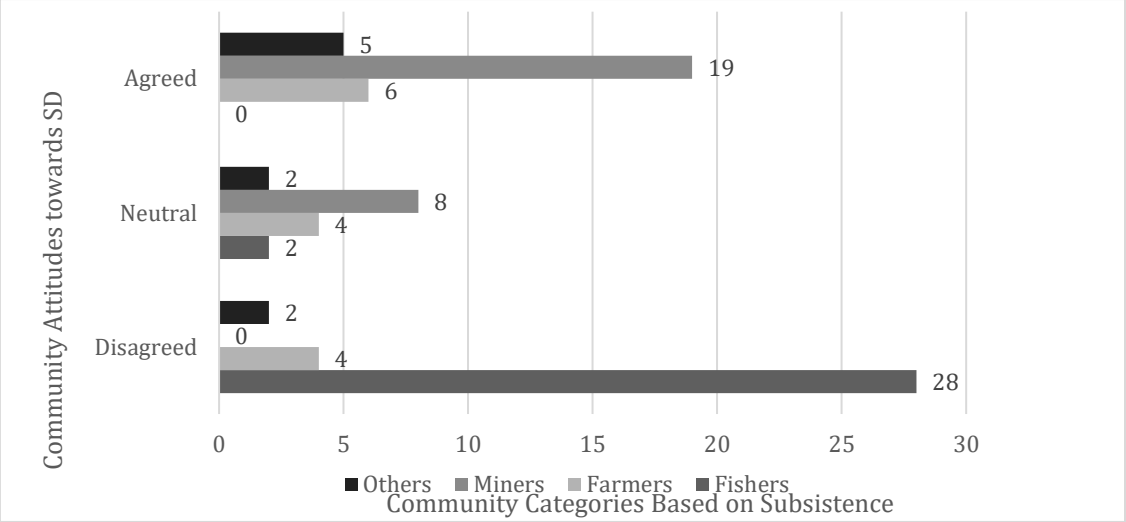

Figure 10 Community Attitudes toward Suction Dredger Based on Subsistence Activities
Source: Household Survey, 2016

One of the major reasons why this polarization has been occurred is because of the different experiences resulting from Suction Dredger. A majority of villagers in the Agree Group (50 percent) mentioned that economic compensation and royalties became the primary reason for their acceptance of Suction Dredgers, but interestingly, a quarter of the villagers in the Agree Group (25%) simply followed the majority as they did not really understand what was going on and what the consequences would be. They experienced direct impacts of exploitative large-scale mining on their fishing activities as Suction Dredgers mining grounds intersect fishing grounds.

The results show that 97% of the fishers experienced difficulties catching fish due to depleting fishing grounds that require a deeper *bagan* structure and longer travel distances with limited technical capacities. As a result, all of the fishers experienced a depletion of fishing yields. HD (46 years old), one of the local fishers, stated:

> *In this area, anchovies have historically been the main fishing commodity of local fishers. Since the last decade or so, the quantity of anchovies caught has been drastically reduced, even though there were still many squid or shrimp in the shallow sea. There was a time when sea water was clean and we could see coral reefs. However, after suction dredgers operation, it is not possible to find them because the condition of the sea water has become dirty and muddy.*

Similarly, another fisher, MH (48 years old), stated:

> *Before, I was able to build my bagan within 500 meters of the coastline. The yields were abundant with a variety of fish. Within a few hours, I could catch a minimum of*

one and a half sacks of fish (approximately 100-150 kg). Now, though the bagan is built almost two miles away, the yields are unpredictable and far from what we used to earn in the recent past. Moreover, if the suction dredgers move toward our bagans, we are lucky if we catch even 20-30 kg.

In addition, 23.3 percent of fisher's experience scarcity of a particular fish, such as kembung, yellow tail, and other varieties, while 37 percent experience a depletion of fish quality. MK (42 years old), a local fisher who has continuously relied on *bagan* fisheries, stated:

In the beginning of the east season, normally we were able to catch medium and large size shrimp and some medium size high-quality fish,[6] *but in the last few years, they are no longer found. It certainly affects the amount of fish available in the market and that correlates with fluctuations in fish prices. Besides, many people, including myself, feel like the taste of fish has gradually changed. The change in taste might be because of leading contamination in the sea water [as explained by an extension worker to this key informant].*

This suggests that fishers bear the greatest impacts of mining activity including impacts on the amount and variety of fish caught, difficulty in catching fish, and the price and quality of the fish. Consequently, fishers had to increase their working hours and operational costs and improve their logistics. Another local fisher, RF (39 years old), stated:

I used to go fishing early in the morning and would come back home before noon with sacks of anchovies. Nowadays, until late afternoon, I cannot catch an even half a sack of anchovies. Moreover, I fish five days a week. Consequently, whether I want to or not, I have to fish every day for long hours to meet my household food demands.

While only 37 percent of respondents agreed with Suction Dredger operations, a majority (54%) considered compensation and royalties (cash and tin loading wages) as the primary motivating factors is in accepting dredging. Other important reasons for their agreement include competing with neighboring villages (13%) and following the majority within the group (20%). The prominent reasons for disagreement with Suction Dredger operations include compensation and royalty amounts not balanced with the economic losses they sustained (35 %) and 26 % showed concern about not receiving benefits once Suction Dredger operations cease. Some villagers (21%) disagreed because the

[6] Here, high-quality fish refer to those exported by Indonesia such as kerapu, yellow tail, tenggiri, and other expensive fish.

compensation and royalties received were low compared to the quantity of tin extracted.

Therefore, it can be concluded that the shift in local people's perceptions was influenced by their perceptions of the impacts of Suction Dredger operations and the income and other resulting benefits. The capability of locals to perceive the impacts and benefits of Suction Dredger operations is influenced by education levels, options for income generation, and personal assets. Village officer representatives mentioned that Selindung Hamlet is considered less developed than the other hamlets in terms of regional development infrastructure and quality of natural resources. Results show that the Disagree Group (23 respondents), which is dominated by fishers, has the lowest literacy rate while elites and small-scale mine owners (11 respondents) who support Suction Dredger tend to have higher literacy levels. Furthermore, the hamlet chief elaborated that the gap between those who support Suction Dredger and those who do not somehow creates distrust over direct payments of profit shares. This has occurred several times in the past, creating internal conflicts within and among the groups.

Another factor that influences local perceptions is opportunities for generating income. The majority of respondents (71%) adopt a double income strategy, while 29 percent rely on a single income source due limited assets and resources, limited skills, limited options for alternative income sources, etc. Among those who adopt the double income strategy, 54 percent apply a diversification strategy where fishing is their main livelihood activity and agriculture is a supporting livelihood activity. Forty-six percent apply a seasonal strategy using a combination of income sources such as fishing in the east season and small-scale mining or day labor in the west season. Responses from the Disagree Group show that 25 out of 34 utilized double income strategies while 12 in the Neutral Group and 17 in the Agree Group used double income strategies, as shown in Figure 11.

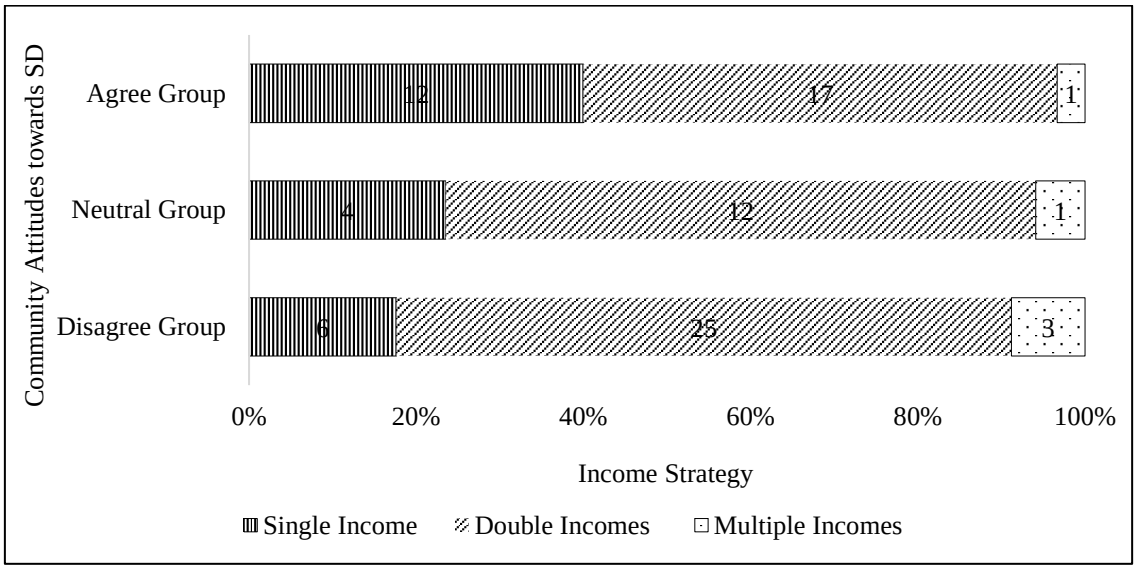

Figure 11 Community Income Strategies
Source: Household Survey, 2016

Discrepancies in the views expressed by representative developers and interviewees from which the local community highlight difficulties in managing the community funds in a way that is broadly perceived as fair and effective and that presents meaningful benefits to the community.

Table 6 Percentage of Land Ownership Assets among the Disagree Group, the Neutral Group, and the Agree Group

		Land Ownership Status of the Disagree Group (%)			Land Ownership Status of the Neutral Group (%)			Land Ownership Status of the Agree Group (%)		
		Leased	Self-Owned	Mixed	Leased	Self-Owned	Mixed	Leased	Self-Owned	Mixed
Land Size	0.1-2 Ha	20.5	32.3	8.8	25	25	0	6.7	6.7	3.3
	2.1-4 Ha	3	0	5.9	6.25	6.25	6.25	3.3	10	3.3
	>4 Ha	3	3	5.9	0	0	0	0	0	0
Land Utilization Status	No Land			17.6			37.5			66.7
	Productive	28.6	36	21.4	27.3	36.4	9.1	10	20	10
	Non-productive	3.5	7	3.5	18.1	9.1	0	40	10	10

Table *6* shows that 66.7 percent of the Agree Group, 35.7 percent of the Neutral Group, and 17.6 percent of the Disagree Group do not own land. The Agree Group has the lowest amount of land ownership, while the Disagree Group has the highest. Among all three groups, the majority owns less than two hectares of land. Slightly more than a quarter utilize leased land (government-owned land). Not all of the land be owned by locals is cultivated productively. In addition, the result shows that 40 percent of respondents from the Agree Group own non-productive land, while in the Neutral Group and the Disagree Group, most of the respondents mentioned that they cultivate their land.

5.3 Mining Permit Procedures

The community decision-making process involves several stages. The pros and cons for each relevant party are also considered. There are several meetings between the community and representatives of the local government in an effort to reach an agreement. Even though Air-Putih Village consists of five hamlets, local decision-making and compensation and royalty distributions occur primarily in Selindung Hamlet because Suction Dredgers operating points are located there. The chiefs of other hamlets join in the decision-making process as observers. The mining license procedure is divided into four stages, including the pre- and post-operation stages, as shown in Figure 12.

The first stage begins with a mining permit proposal submitted to the hamlet chief by the Suction Dredgers Company. In the initial response, the hamlet chief explains the process and the terms and conditions regarding the requested area of operation, compensation, and royalties. Next, the hamlet chief requests informal consent from the villagers and reports the results to the village officers if there is positive feedback; the company must hold a PCM facilitated by the local government in the second stage of the decision-making process. The PCM involves various societal groups such as community members, village government officials, company representatives, and representatives of the village security forces.

The purpose of the PCM is to involve all the relevant stakeholders and to obtain consent for the operating procedures, compensation distributions, site selection, tin loading employment, etc. It is obligatory for the company to provide a contract offer according to the terms and conditions. In the third stage, locals decide whether a Suction Dredgers` mining permit will be granted by the hamlet. If the contract offer is not approved, the company is given the chance to renegotiate the offer and if there is still no agreement, the company must withdraw its proposal and look for another mining site. If the contract offer is approved, Suction Dredger operations may commence. In the final stage, operating procedures on the distribution of compensation and royalties as well as the management of local employment for tin loading activities will be organized.

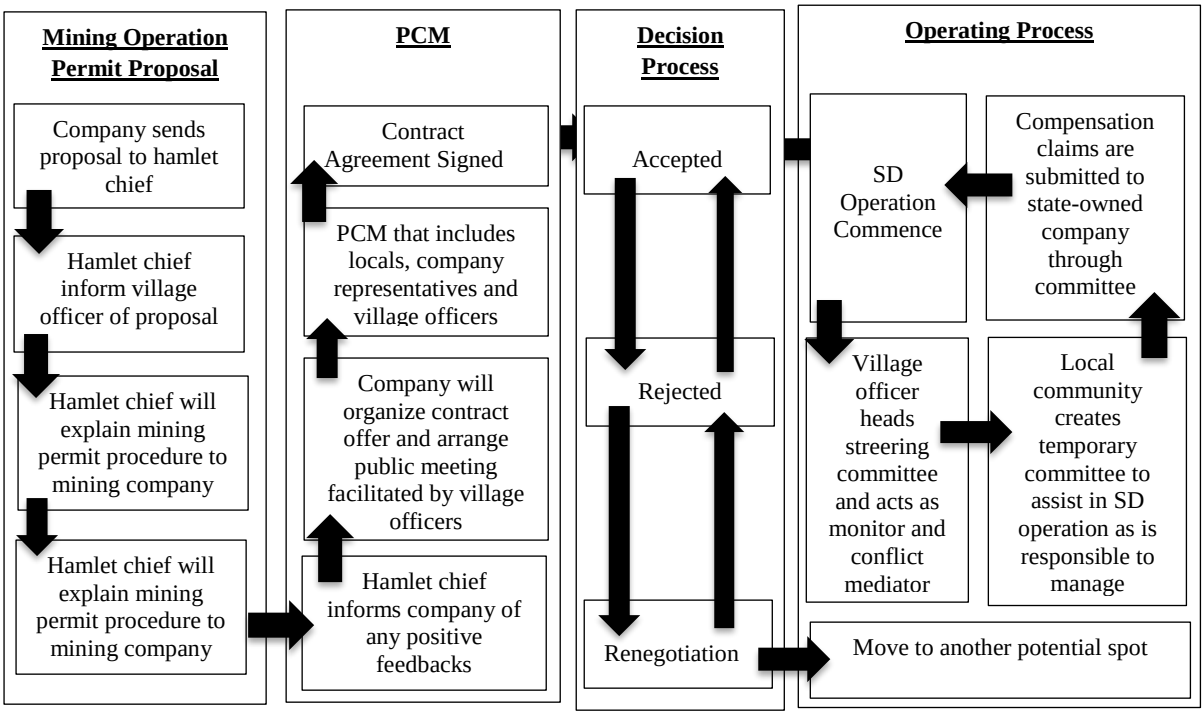

Figure 12. Tin Mining Licensing Procedures
Source: Key Informant Interview, 2016

The first public meeting was held in March 2011. All households in Selindung Hamlet were verbally invited to the Public Consultancy Meeting, considering the small number of households and settlements located in close proximity. During the Public Consultancy Meeting, locals were expected and encouraged to express their opinions and to engage in a dialogue with the company. However, 15 percent of the total respondents did not participate in the Public Consultancy Meeting. Figure 13 highlights that, the Disagree Group had the highest absenteeism with two potential reasons being unwillingness to attend or because they were not informed.

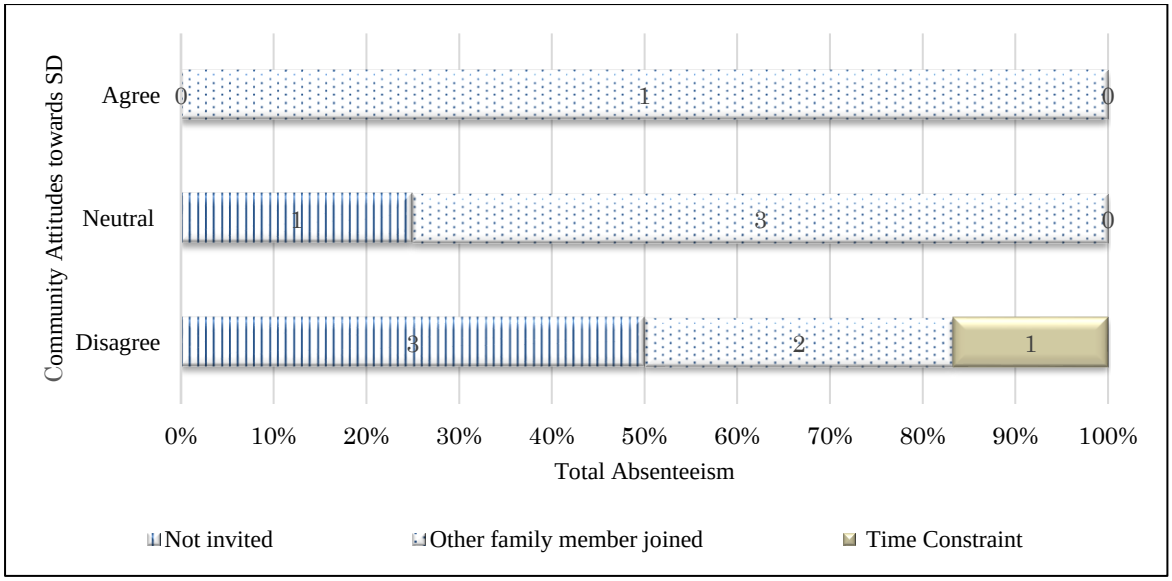

Figure 13. Reasons for Absenteeism at the March 2011 PCM

Source: Household Survey, 2016

The household survey results reveal that not all Public Consultancy Meeting attendees understood or cared about the purpose of this meeting (31%), while the remaining 69 percent knew and understood the purpose of the PCM.

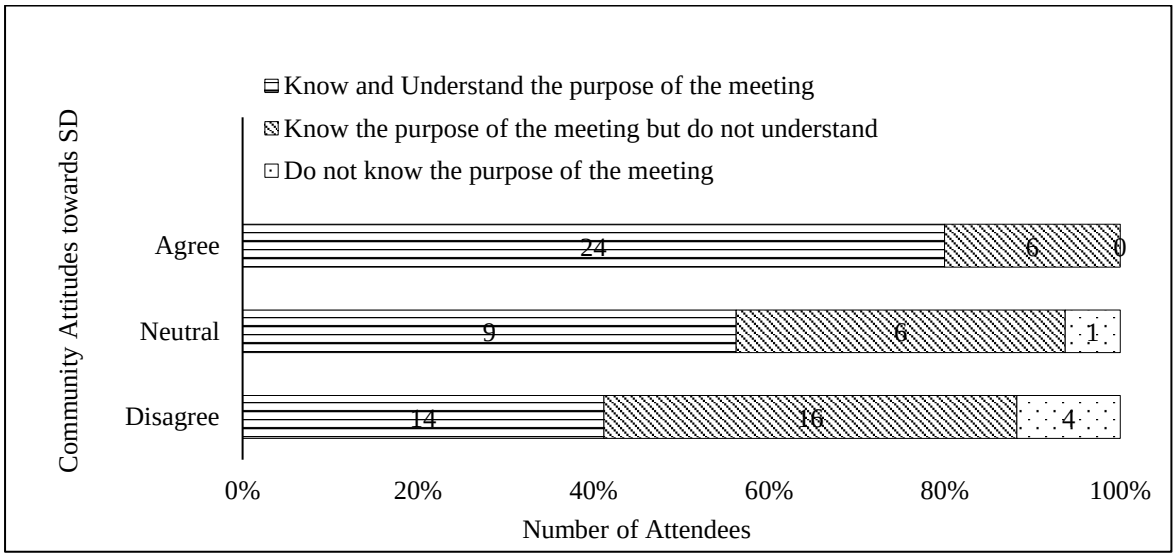

Figure 14. Attendees' Knowledge and Understanding of the purpose of the PCM (March 2011)

Source: Household Survey, 2016

Figure 14 shows that the Agree Group has the highest number of attendees who knew and understood the purpose of the meeting, while the majority of attendees who knew the purpose but did not understand why the meeting was being held and attendees who did not know the purpose of the meeting were in the Disagree Group. This shows the different degrees of knowledge and understanding in each attitude group. Suction Dredger companies provide an attendance sheet that is later used as

evidence that the community agreed to Suction Dredger operations. Contract offers are determined and renewed every season depending on the public agreement after considering the needs of local communities. The public can voice objections during the Public Consultancy Meeting. In the in-depth interviews, a few informants mentioned that the attendees who actively participated were primarily local elites and locals who strongly supported Suction Dredger operations. One village officer stated:

> *The PCM should be held at a place where people can interact directly with the company representatives. The company should inform the public of its operation plan while locals can discuss their concerns, expectations, and maybe the possibility of cooperation opportunities, but I observed a local tend where attendees were passive and simply observed and listened to the discussion, which in most cases, was dominated by hamlet or village elites.*

Apparently, the economic benefits package became a contentious topic during the Public Consultancy Meeting. A variety of questions and opinions were expressed by the village and hamlet representatives and some locals belonging to the elite group. One local elite who was also the mine ownerstated that:

> *I actively participated in the Public Consultancy Meeting because, as a community representative, I wanted to know how locals could benefit from the operation. Specifically, I raised questions about what kinds of opportunities we could expect from the operations, including income generation, employment opportunities, etc. Luckily, I was given the chance to speak by the moderator and I asked important questions on behalf of the community.*

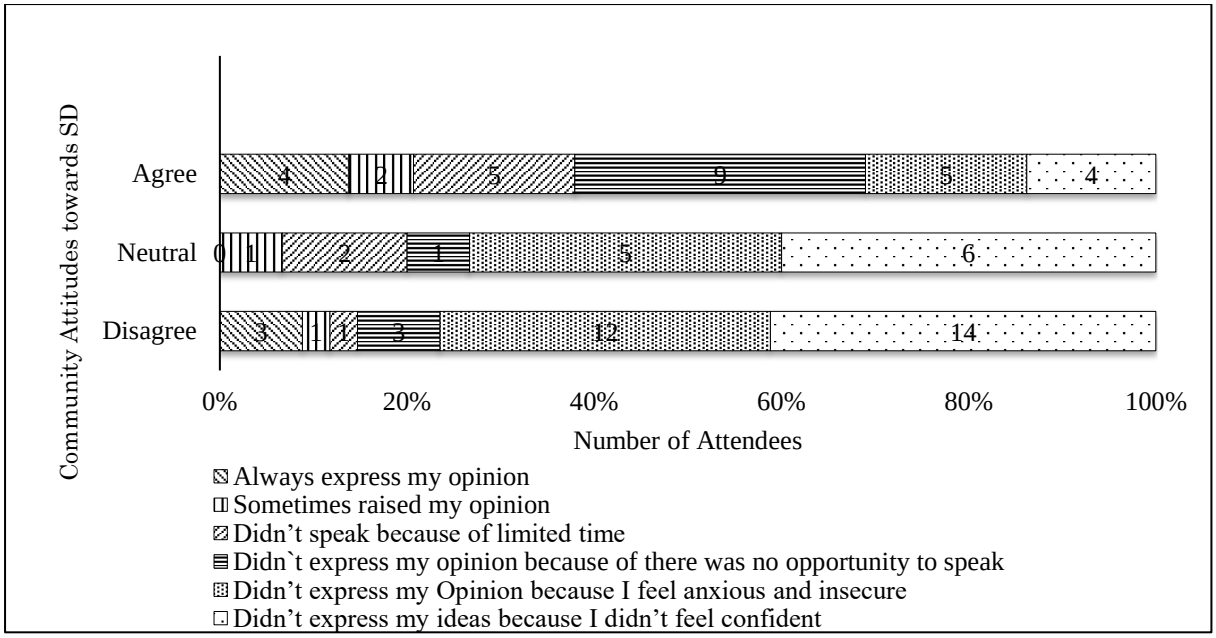

Figure 15. Attendee Participation at the First PCM

Source: Household Survey, 2016

Figure 15 highlights that the majority of the Disagree Group and the Neutral Group stated that their passiveness was a result of feeling anxious, insecure or not confident. One of the respondents in the Disagree Group discussed his experience as follows:

> *I was present at the PCM, even though I initially did not know what the purpose was. My neighbors told me that there was a discussion in the village hall about coastal mining. During the event, I just listened to the company, village officers, and some active participants because I am not an educated person so I think my opinion may be worth less than that of other participants, though to be honest, I did not really know how these suction dredgers would work and how they would affect my daily activities.*

The feeling of insecurity also affected villagers' attitudes:

> *I'm just an ordinary person like many other villagers with no position in the village government and I never had any experience concerning village governance. I believe elders and experienced villagers should speak for the benefit of the whole community such as Mr. XYZ, the owner of the land where I work for day wages. Additionally, because I am only a day wage laborer, to avoid conflicts, I have to agree with whatever my boss says. Otherwise, it might affect my relationship with the land owner as well as my income source.*

TN (38 years old), one of the respondents in the Disagree Group, expressed his disappointment because he did not have the opportunity to submit questions related to how the process would damage his fishing gear because there was insufficient time. Thus, the lack of opportunity and lack of time also influenced the low participation of attendees.

5.4 Actors Involved in Mining Permit Decisions

In this section, I present the results from our key informant interviews and the FGD to address the actors involved in mining permit procedures (Figure 16). Power relations within the decision-making process form one of the factors that affect the local political situation in Selindung Hamlet and in Air-Putih Village as well. This section also includes both positive and negative considerations of the relevant stakeholders.

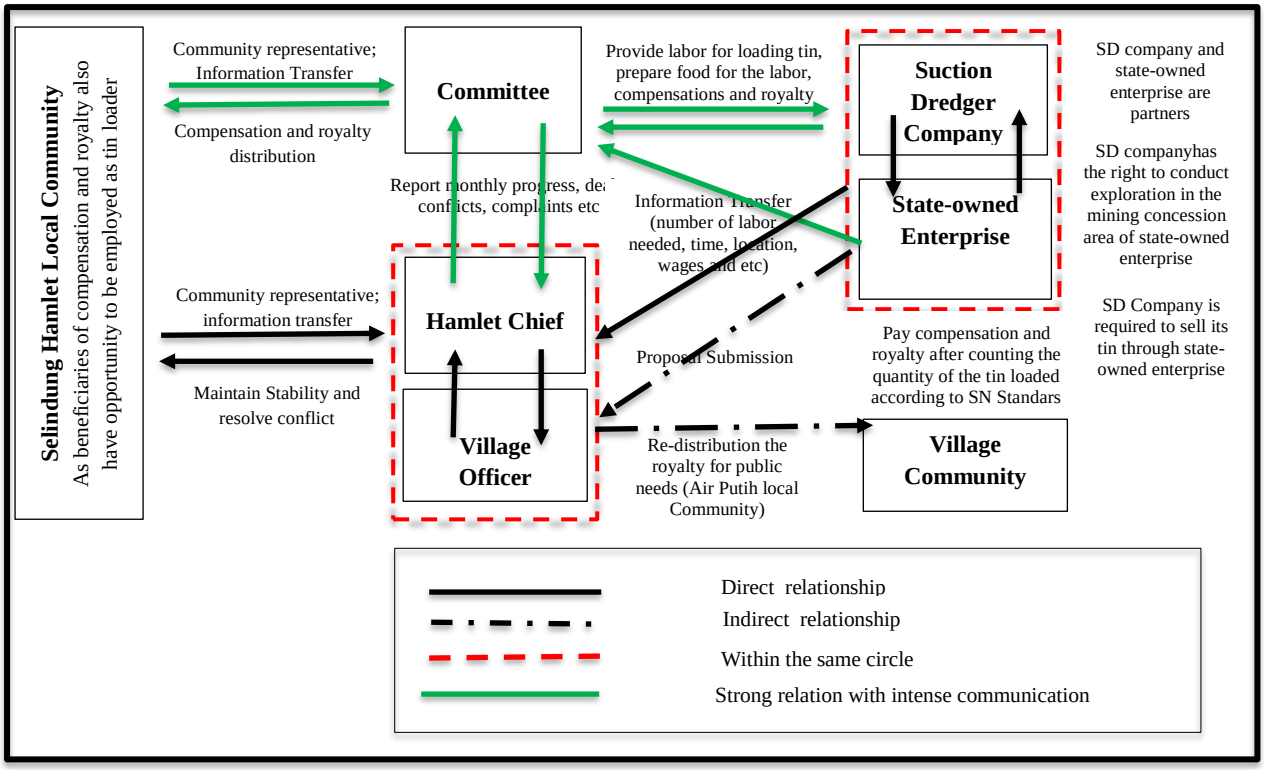

Figure 16. Actors involved in the Decision-Making Process

The primary decision-making actors are committee members, the hamlet chief, and the suction dredging company. Additionally, village officers, state-owned enterprises, and Air-Putih Village community members are also important stakeholders in the decision-making process for large-scale tin mining. Key informant interviews revealed that the hamlet chief and the committee hold strategic positions that bridge the company and the rest of the stakeholders. The hamlet chief and the committee deliver information to the company and vice versa. The hamlet chief also plays the role of mediator among all stakeholders, ensuring that the entire process from proposal submission to acceptance or

rejection runs smoothly. The role of the hamlet chief is also important because he is very influential and is typically knowledgeable about the area and the community. The committee, with members elected during a public meeting every season, represents locals and acts as a liaison between the company and the community. The attendees are welcome to nominate themselves or other attendees as committee candidates. One member is appointed as the chief of the committee and is responsible for distributing and controlling the division of labor among members.

The results show that not all community members want to be involved in the committee. Eight percent of the total respondents were not willing to be involved because of a lack of time, personal abilities, health conditions, and personal preferences, while the majority of respondents (30 percent) are involved in the committee every season. Participating as a committee member comes with cash benefits but practically speaking, some respondents felt that the time and energy was not worth the extra cash they received.

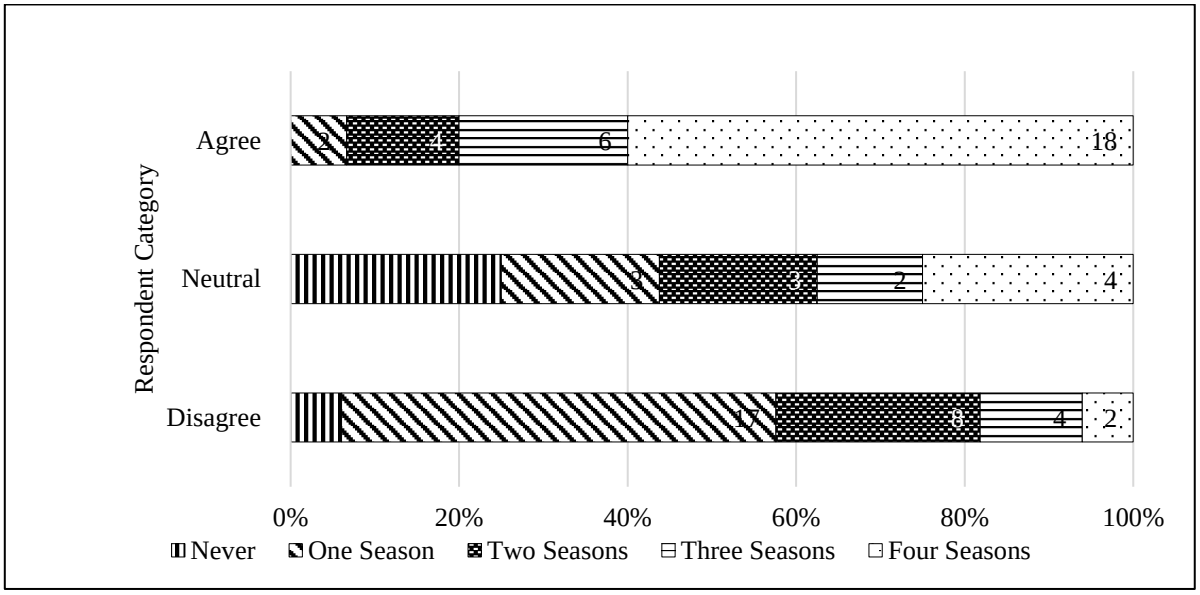

Figure 17. Community Involvement as Committee Members

In addition, Figure 17 emphasizes that there is a decreasing trend in the number of people who participate in the committee. The Disagree Group has decreased participation in all seasons while the Agree Group participation tends to increase each season.

5.5 Mechanism for Compensation and Royalty Distribution

The Public Consultancy Meeting provides a platform for the company and community to discuss the compensation and royalty mechanisms. In this meeting, the local community is assured that the project will bring prosperity to the village by improving infrastructure; providing communal facilities; increasing access to the market; the construction of roads, bridges and networking facilities; etc. As shown in Table *7*, the company is required to pay a basic entrance fee before commencing mining activities at the beginning of the mining season every year. The company pays Committee Operational

Costs (750 USD), Local Community Shares (750 USD), and a fee for the construction and maintenance of a mosque (375 USD). Additionally, the company also pays royalties and compensation to the local community, the Suction Dredging committee, village officers, and for village development. Fishers are considered to be most vulnerable to the negative impacts of dredging activity. Thus, they are given additional cash benefits as compensation.

The suction dredger company does not hire locals because operations require specific skills and expertise. Nevertheless, the company provides opportunities for locals to earn additional cash by working as tin loading laborers. Tin loading activity normally occurs once in two weeks for each operating suction dredger. The number of laborers needed depends on the amount of tin to be extracted. More than half of the respondents (53.66%) regularly participate in tin loading activities, while the rest occasionally participate because they consider that earned wages from tin loading are not in line with the energy and time spent. People are also not keen to participate because the calculation of wages is considered unjust. Some labourers work less and others work more but they receive the same amount because the total amount earned by all laborers is divided equally among them. It is important to mention that the extracted tin is wet and heavy but many of the wages are calculated after it is processed into the dry tin. Key informants showed concern about weighing techniques and the associated wage allocations.

All community members have the right to receive cash based on their age (productive or non-productive), their household status (widowed or married), special considerations (having permanent work, health conditions, etc.). Who receives the cash and the amount of cash received are determined by the committee and amounts are calculated based on the amount of tin extracted by the company. Then, tin loading wages are added as well as reimbursement for loss and damage (if any) to fishing instruments caused by Suction Dredger activity. Committee representatives receive compensation and royalties that are later disbursed to the community. The date and time for compensation and royalty distribution are decided by committee members according to the payment schedule provided by the company.

However, the impacts of suction dredger activities in Selindung Hamlet were not equally shared among all villagers. Fishers were impacted the most because of the overlap of mining and fishing grounds. This situation brought about the shift in the community's perceptions, resulting in local polarization because some people started realizing that the adverse impacts of Suction Dredger threatened their livelihoods. The communities' members who support the dredging are primarily those who did not experience direct impacts of Suction Dredger operations and they consider Suction Dredging a potential source of income. Coastal resources contribute greatly to local livelihoods, not only in terms of economic resources but also in emotional and historical attachments to the community and their identity as fishers. HT said that 'fishing is not only our profession but it is embedded in our souls and spirits, giving us life, and giving me and my family a future. We do not want our sea to be

destroyed'. Similarly, TJ (34 years-old) stated:

> *Fishing is our identity. My whole family does it for a living. It is more than just a source of income for us. The occupation of fishing is transferred to us by our ancestors. My grandfather and father were both fishers and I do the same.*

Although those who came as migrants were not emotionally attached to the land around them and were likely neutral, they preferred to follow the majority, expecting economic benefits but not wanting to show their concern by supporting or rejecting suction dredger operations.

A total of 74 percent of the respondents who disagreed with Suction Dredging operations considered cash compensation as less important, while conversely, neutral community members and those in agreement considered cash important, along with tin loading employment. Electricity received special consideration because all of the groups expected the installment of electricity but due to high costs and the community's failure to seek government support, the Suction Dredger Company offered to install electricity as a form of compensation instead. However, Suction Dredger technology was adopted from abroad; hence, its operations require specific skills and expertise. Therefore, the majority of workers on Suction Dredging Ships are foreign workers and some are Indonesian skilled laborers, while locals can only work as tin loaders with limited opportunities and income.

Table 7 Community Perceptions on the Economic Benefits of Suction Dredger

	Disagree (%)				Neutral (%)				Agree (%)			
	NI	LI	I	VI	NI	LI	I	VI	NI	LI	I	VI
Electricity				100				100				100
Mosque			17	83				100			7	93
Hamlet road		50	25	25			12.5	87.5		17	17	76
Car for common use	83	9	8			25	50	25			50	50
Cash compensation	9	74	17				12.5	87.5				100
Tin loading	16	53	31				75	25				100
Compensation for damage		6	85	9		37.5	62.5				73	27
NI: Not important; LI: Less important; I: Important; VI: Very important												
Source: Household Survey, 2016												

Nevertheless, it is interesting to note that several interviewees from the local community asserted that the amount of compensation provided by the Suction Dredging Company was managed by a committee dominated by members of the Agree Group, locals who supported Suction Dredgers. Local participation affects different trends in each category. Participation in the Agree Group increased from season to season. Additionally, committee members determined the calculation methods, while locals received compensation in aggregate without knowing the details. Even among community members, the committee was dominated by certain elites, resulting in an unfair distribution of benefits. Due to the

illiteracy factor, locals were not able to act critically upon becoming aware of this situation. They are orientated to simply expect economic benefits without a social or political sense of the consequences. Generally, Suction Dredging operations affected community members who were both, directly and indirectly, connected to it. Both experienced different levels of impact (positive or negative). Regarding the impacts, locals began to experience them directly; then they realized that the benefits were less than expected.

Yields of important fish species and related incomes declined over this period. Therefore, as shown in Table 8, the Disagree Group considers coastal reef destruction (83 percent) and polluted sea water (74%) as very concerning impacts.

Table 8 Community Perceptions of the Impacts of Suction Dredger

	Disagreed (%)				Neutral (%)				Agreed (%)			
	NI	LI	I	VI	NI	LI	I	VI	NI	LI	I	VI
Destroyed the coral reef			17	83		37.5	62.5		50	50		
Polluted sea water			26	74		50	50		27	46	27	
Difficulty buying fish		15	85				75	25		73	27	
Rising fish prices		17	83				75	25		93	7	
Potential conflicts among villages		25	75				50	50		50	50	
NI: Not important; LI: Less important; I: important; VI: very important												
Source: Household Survey, 2016.												

The destruction of the coastal ecosystem was serious enough to make fishing livelihoods no longer viable, as the fishers of Selindung Hamlet work primarily around the Suction Dredgers mining grounds. The Agree Group generally considers the environmental impacts as less important because they do not directly affect their daily income sources. In addition to the discussion in the previous chapter, difficulty buying fish and rising fish prices have become two important concerns for the majority of respondents, because fish is considered an essential local food source.

5.6 Discussion

Political control of tin resources reflects complex governance because it involves multilevel actors with diverse power, knowledge and interests. The tin mining industry is characterized by its destructive force, which can create conflict over the distribution of impacts and benefits in both political and economic terms. However, according to Hall et al. (2015), it is widely recognized that extractive industries need to gain and then maintain a *social license to operate* from local communities in the geographic proximity of operations, particularly, from those who are most directly affected by mining operations.

Decentralization brought about a natural resource paradigm shift from state-centred control towards regional control, which enabled the local community to play a more active role in the decision-making

process of how their local resources are used (Agrawal and Gibson, 1999). Further, the shift in governance increasingly transferred authority over the mining industry to non-state actors (e.g. civil society and the market), corresponding to a focus on the 'social' dimensions of development and the need for greater public participation in decision-making (Prno and Slocombe, 2012).

First, suction dredger was the driving force that pushed the affected local community into marginal spaces. In fact, the destruction of the coastal ecosystem was serious enough to make fishing no longer a viable livelihood. It is evident from our results that among each of the categories, the Disagree Group consisted mostly of fishers. This situation leaves them at a significant disadvantage because they lack assets, have limited options for alternative income sources and lack knowledge on how to mitigate or adapt to the severe negative impacts of suction dredger operations. Almost two-thirds are day-wage fishers with unstable income, and slightly less than one-fifth of those day-wage fishers do not own land. In addition, this condition has forced them to find alternative income sources that are more sustainable, but the illiteracy factor, limited skills, and limited capital have become huge barriers for this marginalized group. While operations continue in neighboring villages, they have become marginalized.

The results of this study are in line with Robbins' (2011) definition of the concept of marginalization, which offers a powerful lens to understand how the least powerful groups in society are vulnerable to socio-environmental changes. Robbins (2011) defined marginalized people as politically and socially marginal (disempowered) and as pushed into ecologically marginal (vulnerable and unstable) spaces and economically marginal (dependent and narrowly adaptable) social positions, resulting in their increasing demands on the marginal (increasingly limited) productivity of ecosystems. Further, social inequalities limit their livelihood options, leading them to degrade landscapes and occupy hazardous environments, which constrain their abilities to cope with environmental changes.

The affected locals are marginalized by two potential factors. The first is grey participation[7] within the local decision-making framework regarding the issuance of social permits for mining operations. This second is an imbalance in the distribution of benefits and impacts generated from suction dredger operations.

Public meetings should be a forum to accommodate all those involved in freely expressing ideas, aspirations, refutations, and opinions without force or external influence (Prno and Slocombe, 2012). Limited opportunities, feelings of anxiety, and a lack of confidence became reasons for the low participation of attendees during public meetings. Thus, they preferred to act as passive participants.

[7] In this study, I offer a new terminology of grey participation which emerged as the product of social-political contestation within coastal resource governance in the tin-producing region. The idea of grey participation is translated as a manipulated participation where village elites, local political system, and the large-scale mining company takes advantage of people of attending meeting in which social license is given with their consent but they lack knowledge on why they have been called to gather, what personal and communal benefits the company can bring, what potential short and long-term impacts of suction dredger they have to face due to those large-scale extractions. Such ambiguous situation is called grey participation in this study. These factors need to be addressed to ensure that the local do not get marginalized.

Several interviewees did, however, point to ways in which the active participation of local elites during public consultancy meeting reflected the pattern of elite domination in the local power structure by using their power and influence to combat private gain. This leads to the centralization of the interests of local ruling elites and potentially marginalizes the interests of lower-level social groups, particularly the most affected groups. The absence of active and equal participation of all affected groups thwarted the social learning opportunity for the community, an underlying principle of the practice of democracy.

On the other hand, with increases in societal concerns relating to environmental issues, companies should ethically disclose both positive and negative impacts of their operations. Not surprisingly, however, companies focus on how to attract community support by providing the services they need, without emphasizing the negative side effects of their operations. Thus, the community, as a silent attendee, unaware of the real short- and long-term impacts, accepted the suction dredger proposal. Ironically, there was also a growing belief among fishers that they would generate instant income immediately simply by accepting the suction dredger proposal. Further, they envied neighboring villages that were reaping the economic benefits of suction dredger operations.

Therefore, I see public participation in the decision-making process as *grey participation*. This is evidenced by the following situations. First, not all community members attended the PCM, and most of those who attended did so without actively participating because of the local political setting that gave priority to local elites. The second is the negligence of the company and the local government, both of which focused on convincing people of the benefits without fairly disclosing the potential negative impacts on the environment and how those impacts would affect local livelihoods. Therefore, the community gave their consent without knowing and understanding the short- and long-term benefits and impacts.

Understanding the potential negative short- and long-term effects is important because the local community could have proposed mitigation and adaptation strategies for possible negative impacts. In addition, as regulated by environmental assessment legislation written in Environmental Protection and Management Law 2009 and Environmental Permit Regulations of 2012, transparency and disclosure of environmental impact assessment and licenses should be provided fairly through public announcement, participation, and consultation. However, the company showed negligence by not fairly disclosing proper information regarding the impact of suction dredging or describing how these sets of regulations would translate into action.

In the responses to the surveys and interviews, a question arose about how local people drew on their perceptions and gradually shifted their attitudes to support suction dredger operations. This situation can be explained by the fact, as Prno (2013) suggested, that local acceptance is dynamic, inevitable, and time and context-specific which means, thus, that it reflects local social, economic, and environmental conditions and that community priorities, capacities, and expectations will vary depending on the setting. Therefore, local approval for suction dredger operations also changes

dynamically, depending on the hamlet and village condition, such as whether or not it meets peoples' expectations and its contribution towards the region's wellbeing.

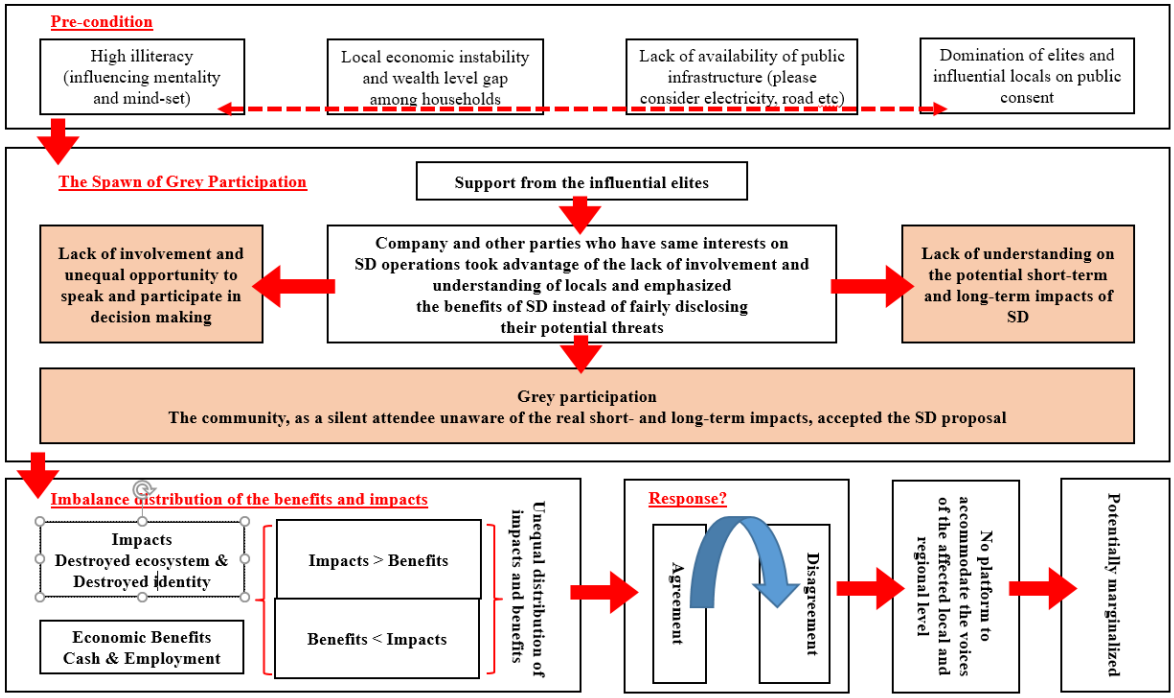

Figure 18. Local Marginalization

As shown in Figure 18, high illiteracy, an economic gap, limited infrastructure, and the domination of the local elites became factors that triggered the marginalization process. Suction dredging companies, together with locals who had the same interests, took advantage of the lack of involvement and understanding of the locals who were at risk of serious potential impacts and threats to their livelihood. Additionally, the company emphasized only the benefits of suction dredger instead of fairly disclosing the potential threats. These issues were exacerbated owing to the lack of availability of public infrastructure and expectations of incremental gains in economic status.

People who actively participate and have influence in the decision-making process are generally politically strong and usually experience minimal negative effects from the suction dredger operations; they also have more opportunities to generate cash through participating in the committee. The committee holds a strategic position in the village by bridging the locals and the company, particularly relating to the distribution of compensation and royalties. Those who are actively involved and dominate the committee are generally also the ones who do not have an interest in the sustainable management of coastal resources and who strongly support suction dredger operations. Others, like the fishers, weakly participate in the public consultancy meeting, even though their livelihoods' economic base, identity attachment, and socio-cultural practice are highly threatened by tin extraction (as fishing and mining extraction share the same ground).

In addition, fishers who do not own land and whose income is therefore highly dependent on the

bagan owner are the most potentially marginalized. The livelihood insecurity drives some of them into unsustainable mining activity as an adaptation strategy, leading them into an even more vulnerable state. They respond to the ongoing changes and livelihood threat by either shifting their livelihood from fisheries based on mining activity, engaging in coastal mining through a profit-sharing mechanism with the seasonal migrant miners, or potentially converting the available land into mining ground. In summary, the marginality of these vulnerable landless dependent fishers who are facing difficulties has trapped them into mal-adaptation.

Resource governance matters for the environment and for the people who live close to extraction sites. Hence, I believe that people-oriented, practical approaches are necessary to understand the multifaceted problems within a resource governance framework. Strong resource governance may result, on the one hand, in relatively less local environmental impact; on the other hand, under poor resource governance, companies are often lax in their efforts to protect local environments and local communities, and leading to 'resource curse', whereby the poor stay poor and elites accumulate further wealth. We believe that well-governed resource extraction offers a path from poverty can be carried out justly. In addition, one of the key points for good governance is to have stronger institutions and policies: good governance means having good rules, strong oversight to enforce the rules, and the competence and willingness to follow them.

Hence, I suggest the following points for potential improvement: First, Decision-making processes for issuing mining permits should seriously consider both justice and equity from the perspective of all related stakeholders to avoid conflicts of interest. Second, the basis for assessing a mining permit should be according to a community's perspective instead of primarily from a company's perspective. Third, because the community does not share suction dredger impacts equally, the company should allocate more benefits and royalties to those who are the most affected. In order to provide a reasonable compensation, a pre-assessment on household wealth conditions should be conducted to identify their economic condition, along with the impacts they experience because of SD activity.

In addition, fourth, an agreement on revenue and compensation distribution and the allocation of social and environmental responsibilities should involve all parties and should ensure fair distribution. Fifth, before holding a PCM, small group discussions should be held to disseminate specific information to each community group, such as fishers or miners, so that all ideas and issues can be accommodated. And finally, sixth, committee formation should occur in a separate forum after the PCM so that candidates can be mobilized from each group and not be dominated by local elites.

I stress the importance of a proper communication platform that is a top-down approach, as way to accommodate local voices. Such should stimulate transparency of information and dialogue on improved best practices in public consultation, community development, partnership, and collaboration agreements for local and compensation schemes. In addition, such an approach would accommodate the least heard voices of those who are marginalized at the local and regional level.

5.7 Conclusion and Recommendations

This study investigated how large-scale coastal tin mining marginalizes local communities who depend greatly on coastal resources in Bangka Island in Indonesia. The study showed that suction dredging operations are an important part of coastal communities who have historically been highly dependent on coastal and marine resources. Initially, in 2009, most of the locals supported large-scale suction dredger tin mining because they saw it as an instant source of income, but the unequal distribution of benefits and impacts to hamlet inhabitants in later years became the primary reason for rejection. PCMs within the hamlet were arranged by village elites to discuss such issues as suction dredging operation licenses, distribution of benefits, and royalties. The negligence of the mining company and the villages elites in not fairly disclosing both positive and negative impacts and the domination of local elites in meetings and committee membership reflect grey participation in the local decision-making framework on issuing social permits. Grey participation, which has emerged as the product of social political contestation within coastal resource governance in this tin-producing region, potentially marginalizes the most affected communities.

Access to benefits and impacts are not equally shared among all local groups. Community members who disagreed with suction dredger operations and who are highly dependent on coastal and marine resources were adversely affected by suction dredger operations, while those who agreed were less affected because they did not depend on coastal and marine resources. Consequently, people in the Disagree Group were forced to find alternative sources of income. Those who do not have access to land are considered dependent fishers, and if they have no alternative livelihood, they are vulnerable and potentially marginalized. Therefore, people-oriented and practical approaches are necessary to understand the multifaceted problems in complex coastal social-ecological systems.

I strongly suggest that good mining governance be formulated to avoid larger negative impacts for both the community and the environment. Enhancing public consultancies and transparency will boost the interaction and engagement between companies, the potentially affected community, and government representatives. The extensive field data from this study takes this work beyond the usual academic boundaries and makes the outcomes policy relevant. Efforts to catalyze policy change were made even before the study ended, not only for the marginalized community but also for coastal areas as a whole. The study encourages further investigation of how marginalized people might combat the changes caused by suction dredger operation, which was not a part of this research.

CHAPTER 6
ADAPTING LIVELIHOOD TOWARDS TIN MINING IMPACTS IN INDONESIA: OPTIONS AND CONSTRAINTS

Unlike Tanjung Gunung, Selindung has experienced more than four years' suction dredging operation that consequently brought socio-ecological changes in their area. The previous two chapters depicted that large-scale tin mining extraction in Selindung are important part of coastal communities who have historically been highly dependent on the availability of coastal and marine resources. However, the existence of unjust system within local political arena in issuance of large-scale mining permit brought the affected local into marginalized state. This important finding, thus encourage further investigation on how do the affected locals particularly the marginalized people might combat the rapid changes brought by suction dredging operation. In order to explore how the affected local, adapt, Chapter six begin with identifying the socio-ecological changes perceived by the Selindung local community in Bangka Island before and after the spread of large-scale tin mining and how it adapted to those changes. First, it provides a detailed history of changes that occurred from its creation until the research survey in 2016; second, it investigates perceptions of locals about those changes; and third, it explores adaptation techniques deployed for those changes. Finally, I close this chapter by suggesting several recommendations that should be considered to enhance local's capacities to adapt to a changing environment.

6.1 Introduction

Over the past several decades, the link between the human system and the natural system has been degraded drastically by the influence of multiple anthropogenic stressors. The most impacted population as the result of changes in social-ecological systems are the communities that directly depend on the natural system for their livelihoods. As a result, communities that are directly dependent on the natural system must adapt to changing conditions.

Following the previous chapter, this study addresses the important issue of how the local (within boundaries of a hamlet – a portion of a village) community develops techniques in adapting and avoiding the negative impacts of tin mining in the Bangka Island of Indonesia that has been extensively cited as the tin island of Indonesia, where large-scale mining operations have attracted the attention of many national and international scholars regarding its sustainability (Ross, 2014). Some scholars have emphasized on the idea that there is a change in social-ecological system adaptation becomes an integral part of the system to maintain the system (Walker et.al., 2002; Adger, 2003; Folke,2006; Pahl-Wostl, 2007). Going ahead with perspective, it is important to understand the dynamic changes within the socio ecological society and accept that when changes occur adaptations need to be put into place.

Studies focusing on adaptation strategies are not new, particularly in mineral-producing developing countries, where poor, vulnerable communities must deal with fluctuating natural environments (Auty

and Mikesell, 1988). Mertz et al. (2009) elaborated that many adaptation studies provide recommendations to improve the living conditions of local communities, and efforts have been aimed at reducing the vulnerability of rural communities. Adaptation-related studies have been conducted in the context of climate change (Adger et.al., 2003; Smit and Pilifisova, 2003; Deressa et.al.,2009; Abid et.al., 2016; Ali and Erenstein,2017). Adaptation to climate change means adjustments in natural or human systems in response to its actual or expected effects. In this paper, I study adaptation in the context of unsustainable coastal resource management and its impacts on a local community.

From this viewpoint, this chapter sought to explore adaptation strategy of coastal resource-dependent community in Bangka Island, Indonesia. Using case studies from Selindung Hamlet, this paper explores the socio-ecological changes. Our specific aim is to provide recommendations for policymakers to highlight the relevance of a focus on coastal tin mining in development efforts. This chapter offers the following: first, it provides a detailed history of changes that occurred in Selindung Hamlet from its creation until the research survey in 2016; second, it investigates perceptions of locals about those changes; and third, it explores adaptation techniques deployed for those changes.

6.2 History of changes from early formation of Selindung Hamlet until 2016

To explore the history of Selindung Hamlet, I collected data from key informant interviews and Focus Group Discussion (FGD). The historical trajectory approach aimed to provide significant information about past events shaping the future. Results in this section to address the research question of changes that have occurred since the formation of Selindung Hamlet until the suction-dredging, post-conflict period. I identified important events that drove changes. Changes are defined as changes to the environment, lives, and livelihoods, changes to ecosystems and to resource utilization. Historical periods of change in Selindung, Hamlet is divided into the five periods below:

1. Early hamlet formation period (1950 – 1980)

From key informant interviews and FGD, it is clear that inhabitants of Selindung Hamlet originally were descendants of sailor ancestry from Teluk Limau Village, a neighboring village connected by the coastline. In the 1950s, only seven migrant fishers were living in Selindung Hamlet in temporary, traditional non-permanent houses made of coconut stems and leaves. These fishers normally stayed for three days in Selindung Hamlet and headed out for two days to their original place in periodic cycles.

In the 1960s, the number of migrant fishers increased. Some decided to permanently reside in Selindung Hamlet for reason of time efficiency, as well as logistical considerations in commuting with a traditional boat every three day. They began to build semi-permanent wooden houses. As a survival strategy during the low season, the fishers began to engage in small-scale agricultural activities around the beach by planting vegetables including chili cassava and onion. In the early 1970s, they opened the forest for traditional dry farming, as the beachfront land was less productive. They grew peppers as the main commodity, and fruits and vegetables for consumption, including cassava, banana, rambutan, and durian. By rotating crops, locals expected to maintain soil fertility.

2. Hamlet growth period (1980-2000)

In the early 1980s, the coastal settlement shifted to the deep forest and merged with the neighboring hamlet, which was part of Air-Putih Village due to its remote location and low population. This impacted the local land tenure system as more forest land opened. Agricultural land was considered as the most important factor of agricultural production, so to avoid land tenurial conflicts, the community agreed on '*system tebas pakai*'. The agreed rule was that whoever clears the forest land has the right to use the land.

The number of households gradually increased and migrants arrived to pursue economic opportunities (often related to resource exploitation) after a new shortcut road was opened connecting the village main road with Selindung Hamlet in the 1990s. The arrival of outsiders for work and marriage brought new values to the locals. At the same time, formal registration of Selindung Hamlet occurred. After long negotiations with district government, Selindung Hamlet finally became a unitary administrative unit which had the authority to manage its territory in 1997.

3. The community's mining period (2001 – 2004)

Unlike other hamlets, tin mining in Selindung Hamlet was introduced by migrants in early 2002, because of its remote location and access. Numerous small-scale mines, commonly called '*unconventional mines*' emerged which were supported by outside investors. These investors convinced locals to leave subsistence fishing and farming, which was time-consuming and required patience for crop harvesting, and to join tin mining with the expectation of instant cash income.

Small-scale land mining reached its peak in 2004 along with the beginning of small-scale coastal mining by outsiders. By this time, locals were involved only in small-scale land mining, not in coastal mining because they considered it dangerous and risky, and it had high capital requirements. The trend of small-scale mining activity started to decline, along with depletion of land availability, and improper technologies used for mining could not reach the depth of mining sites. This was followed by suction-dredger activity in Selindung Hamlet in 2009 without formal consent from the local community and government, which lasted for approximately two years until the end of 2010.

4. The spread of suction dredgers and border conflict period (2009 – 2015)

In March 2011, suction-dredging was permitted by local and district governments. In 2014, suction-dredging stopped due to a border conflict arising from an ambiguity in official maps between two neighborhood villages. The conflict concerned the sea boundary belonging to those one of the conflicting villages and part of Selindung Hamlet that was shown by map in the territory of another conflicting village. Consequently, the Selindung Hamlet lost their rights to access the disputed area. The claims about the right to access and right of ownership of coastal area also concerned who was eligible to receive royalties and compensation from suction dredging, as well as receiving a share from the small-scale mining activity.

5. Post-Border Conflict Period (2016)

At the same time, the hamlet chief allied with Air-Putih Village won the first case in court. The court decision clearly stated that White Hamlet and Air-Putih Village owned the rights to utilize and control the disputed area. A week after this decision, Other Village allowed one suction dredger to operate in its territory with the initiation of large-scale tin mining. At the beginning of August 2016, the number of suction dredgers increased from one to three. Licensing of suction dredgers was not under the control of either Selindung Hamlet or Teluk Limau Village. A representative from Teluk Limau Village confirmed that tin extraction by suction dredger, and benefits generated resulted in internal and external polemics, which created tension among stakeholders. The tensions were exacerbated by the impact of large-scale tin extraction activities by Selindung Hamlet and Air-Putih Village.

In conclusion, the history of changes in Selindung Hamlet shows that introduction of small-scale tin mining, along with large-scale suction-dredging, were the two biggest events that shifted peoples' livelihoods from fishing and farming to mining. Tin mining is environmentally threatening to coastal resources as it does not include precautionary study/methods to protect coastal resources or local livelihoods. Agricultural lands were converted to mining, making it unavailable for farming in the future. Tin mining attracted outsiders as it was profitable. Outsiders bought land from locals to open mines. This caused imbalanced land ownership. In addition, the migration of Palm Oil Plantation Company during the peak small-scale tin mining period worsened this condition. Locals were focused on mining activity, leaving the agricultural activity. Palm-Oil-Plantation Company took advantage of this and bought barren land at cheap prices.

Selindung Hamlet community is connected through inherited family relationships. Social relationships and networks, based on kin, economic, political, and/or other types of ‘personal’ connections are the foundations of everyday life, facilitating day-to-day activities. Social values were changed after the introduction of both small-scale mining and suction-dredging. For instance, prior to beginning mining, locals were socially connected, strengthened by mutual understanding, actively participating in social gatherings and helping one another during hardships. As described by HT (59 years old), a local figure:

> *We are all living in this hamlet were basically relatives, some are bounded by blood, some are bounded by local attachment. Twenty-five years ago, every beginning of east season, local fisher used to build their bagan by the help of other fishers, from cutting the wood, carrying it, until the construction process. I will then provide food for them. The same scheme will be applied for other fishers. But after mining penetration, people will then prioritize their own activity. It becomes very hard to find voluntary human power for began construction, unless we have to hire them as paid labor.*

HT's statement showed how mining has shifted Selindung Hamlet local values to more individualistic, monetary, and material oriented values, driven by mining penetration.

6.3 Local Perceptions on changes occurred from the early formation of the Selindung Hamlet until 2016

To gain insight into how locals perceived these changes, discussions with different subsistence groups (fishers, farmers, miners) involving both men and women were arranged. Results showed that each subsistence group had a diverse point of view and perception about the changes. The detailed description of the discussions with the group is presented follows.

6.3.1 Fishers' perceptions of changes

Both small and large-scale coastal mining creates a dilemma for the local community, whose members compete for livelihoods while facing possible shortages due to resource exploitation. Fishers experienced direct impacts of coastal mining on their fishing as mining areas intersected fishing grounds. Damage caused by the sea, which is difficult to control as it is not visible, is not comparable to damage on land.[8] The waste disposal by a suction dredger and pontoon causing sedimentation of coral reefs brought depletion threats to the coastal ecosystem and triggered significant impact on daily income due to smaller fishing yields. Declining fish populations occurred because suction dredger operations used for the underwater excavation of alluvial deposits were conducted without proper mitigation and monitoring.

Majority of Selindung Hamlet fishers (57%) use *Bagan*[9] *Tancap*, normally called *Bagan*, for fishing. Those without *bagan* (43%) either work as daily wage fishers' who keep other fisher's *bagan* and divide profits or use other fishing instruments like handlines (*rawai*); rods (*pancing*); traps (*Bubu*); nets (*pukat*). Financial capital, as well as durability of fishing instruments, impacts the fisherman's choice of fishing gear. The high cost of *bagan* construction, ranging from 25 to 40 million Rupiah (2500-4000 USD), depending on size and distance from the coastline, is the reason for less ownership.

Compared to other methods, *bagan* is less flexible because its catch is strongly influenced installation position and water quality. *Bagan* owner KJ (52 years-old) elaborated that:

> *Bagan is not a movable instrument. It can only be installed once during the fishing season. Its structure normally made of local wood, therefore bagan has limited strength and durability. It can only be installed shallow sea with a certain depth, i.e. between 7-10 meters. Furthermore, Bagan relies on light to attract fish. If the turbidity level is high, then less fish will enter the net.*

[8] Pontoon is homemade floating dredges that suck ore from the seabed utilized by small-scale coastal miners.

[9] *Bagan* is defined as fishing instrument in the form of lift net that is linked to a bamboo frame building, normally operated at night, utilizing lamp light as fish pull factor. The area of operation for the installation of *bagan* is clear aqueous coastal water, having a depth of 7 - 10 meters. The distance from the beach is 2 -4 miles and between b*agan* about 200 - 300 meters' gap.

Fishers who utilize *bagan* as their instrument are more vulnerable and at higher risk from negative impacts of coastal mining. Survey results show that 97 percent of the fishers experienced difficulties catching fish from depleting fishing grounds requiring a deeper *bagan*, with longer travel distances and limited technical capacities. MH (48 years-old) stated that:

> *Until 15 years ago, I could build my bagan within 500 meters of the coastline. The yields were abundant with a variety of fish, from the low, medium, until the high quality. Within a few hours, I could catch a minimum of one and a half sacks of fish (approximately 100-150 kg). Nowadays, though the bagan is built almost two miles away, the yields are unpredictable and far from what we used to earn previously. These strongly affect our daily incomes and lead us into financially insecure.*

A 46-year-old fisher who formerly caught anchovies said that since the last decade, the quantity of anchovies had drastically decreased. Previously, seawater was clean and fishers could see coral reefs. After the operation of suction dredgers, it was not possible to find fish because the sea water had become dirty and muddy. Additionally, 23.3 percent of fishers also experienced scarcity of a particular fish, such as kembung and yellow tail, while 37 percent experienced a depletion of fish quality. This was described by local fisher MK, (42 years-old):

> *In the beginning of the east season, normally we could catch medium and large size shrimp and some medium size high-quality fish,[10] but in the last few years, they are no longer found. It certainly affects the amount of fish available in the market and that correlates with fluctuations in fish prices. Besides, many people, including myself, feel like the taste of fish has gradually changed. The change in taste might be because of lead contamination in the sea water [as explained by an extension worker to this key informant].*

Fishers perceived that coastal mining activity within their territory drove declining fish yields and related incomes. Thus, fishers felt the greatest impact from mining activity, including on the amount and variety of fish caught, difficulty in catching fish, and price and quality of the fish. Consequently, fishers had to increase working hours and operational costs and improve logistics. In addition to environmental change affecting their livelihood, tin mining also affected local values. One of the local elder, IP (74 years-old) mentioned his anxiety about the dissolution of mutual understanding among fishers:

[10] Here, high-quality fish refer to those exported by Indonesia such as kerapu, yellow tail, tenggiri, and other expensive fish.

Two decades ago, fishers build their bagan by the help of other fishers, applying the principle of mutual help. But nowadays, they have to hire labor to construct their bagan. These kinds of value have no longer existed in this hamlet, eroded along with the rapid development of tin mining operation.

6.3.2 Farmers' perception of changes

Agricultural activity played an important role in the livelihood of Selindung-hamlet local communities. Pepper (*Piper nigrum L.*) and Rubber (locally called as *Karet Rambung* (*Ficus elastic*) and *Karet Hevea* (*Hevea brasiliensis*)) are two crops that were transferred within agrarian households to this hamlet. Selindung-hamlet agrarian households faced socioeconomic challenges from landscape changes during the last decades. Deforestation reduced groundwater availability, followed by the weather uncertainty, which made farmers hesitant to rely exclusively on farming. The climate-related changes experienced by locals are relatively recent, affecting seasonal cycles and subsistence activities. The problem with limited water for irrigation was explained by HJ, an elder who had engaged in agriculture since his childhood:

Farming 20 years ago, as compared today is different. Weather is no longer predictable. The rainy season shifted into the dry season and vice versa. Moreover, water supply is not sufficient anymore. Whenever dry season comes, we must suffer from drought. And these bring loss to us.

One village officer, AD (27 years-old), stated that rapid forest conversion in Selindung Hamlet caused a decrease in water catchment areas, resulting in reduced amounts of available groundwater, especially during the dry season. AD added that although the population of Selindung Hamlet is similar to others, the level of forest conversions is high.

In the peak mining period, massive agricultural land conversion, both by locals and outsiders, strongly affected local land tenure. The situation has worsened due to the presence of a palm oil plantation within the hamlet that has purchased community land at a low price. The result is that 33 percent of total households do not own land. As noted in Figure 19. below, the majority of them (50 percent) sold their agricultural land to Oil Palm Plantation Company, while 30.80 percent of them converted the land from agriculture to mining:

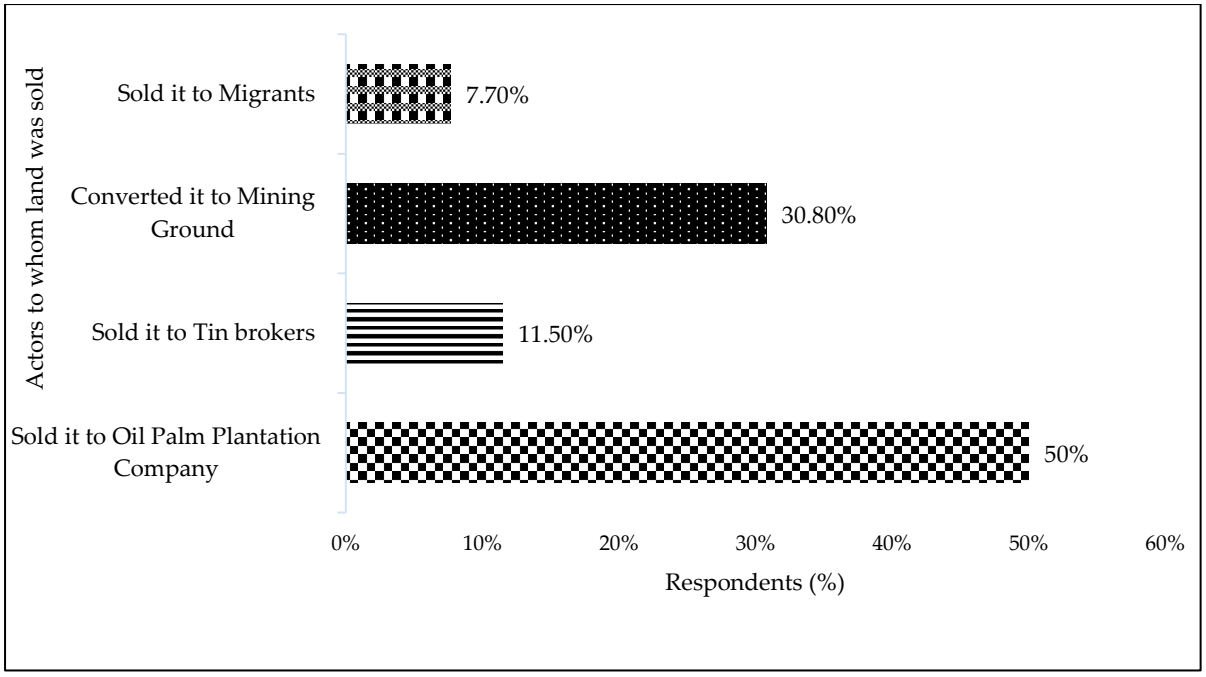

Figure 19 Reasons why locals do not have land

In addition, BR (42 years old), a local farmer who was a miner, regretted transferring his land to another party:

> *In 2004, I started mining after getting encouraged by my neighbor who was doing successful mining business. I was busy with mining and could not find time to do farming or just take care of my land. Instead of letting it bare, I decided to sell some parcel of my land to the palm oil company. Fortunately, I did not sell all land and can perform farming. (BR/42 years-old)*

Some locals retain their land. AM (59 years old), a local farmer, expressed his pride at being a farmer. He explained that his parents reminded him that land is an important asset for food during hardship. He never thought of selling it, even with attractive offers and price. On the other hand, the available abandoned-tin mining lands, formerly used for tin extraction, could not provide a solution for the problem of land needs. Village officer BH (37 years-old) explained that abandoned tin land is considered marginal, dominated by sand fractions, less fertile and only suitable for particular crops, such as palm oil. Locals no longer considered it productive.

During group interviews, I noticed that a majority of farmers were older. When I asked why, FT, a 41-year-old farmer, stated that young people who grew up in the tin era were accustomed to earning money instantly. With a bowl and small bucket, everyone could easily extract tin from land. After tin became rare, people were still accustomed to earning an instant income, and there was no interest in farming. Farming is difficult, and it takes time to make money.

Those who still farm prefer to grow short-harvest cycle crops, like rubber. JK, a 56-year-old farmer, stated that pepper has the highest value compared to other crops. Pepper also has value in that can be exchanged for cash for immediate needs. KL, a 42-year-old farmer, stated that high capital, cost of maintenance, and crop failure (risks of pests and weather) made farmers hesitant to grow pepper. Seasonal data shows that pepper has a yearly harvest cycle, from January to July. Pepper farmers did not enjoy the year-long wait. Shorter harvest cycles mean farmers receive cash faster. Thus, they can use it to fulfill daily needs. This triggered local farmers to grow rubber that is harvested daily.

To summarize, the problem of access to agricultural land creates significant challenges, particularly for those who do not have land. Those with the land, though in a limited amount, are challenged to adjust their farming techniques. Consequently, the uncertainty of income generation has become a consequence of these experiences.

6.3.3 Miners' perception of changes

Small-scale tin mining has been introduced in the 2000s, shifted the main source of income, attracting locals and outsiders, and an influx of migrants. Some locals were driven to mine because of poor crop harvests while others because of unfavorable weather conditions and/or to supplement income following the end of the agricultural season. Villagers began small-scale tin mining activity, locally referred as *unconventional miner/TI* using simple technology. Before the 2000s, only locals were involved in mining. One key informant, RT (49 years old), stated mining activity was considered the driver of change for the rural community. Locals can obtain money instantly. He emphasized that in early small-scale tin mining, each person could earn hundreds from kilograms of tin sand (price of tin per kg 110.000 rupiah=10 USD). However, tin yields were unpredictable due to unavailability of technology to identify tin-rich areas. Therefore, speculation became a technique to determine mining spots, and some used rituals to identify tin resources.

Small-scale mining in Selindung Hamlet provided important main and supporting income for locals. There was a significant increase in households that mined as the main livelihood from 2002 to 2004. Meanwhile, from 2004 to 2009 the number decreased, along with households changing strategies for income. Quitting mining resulted from a depleted tin stock and lack of capital. A local miner, KL (43 years old) expressed his difficult experience extracting tin today:

> *Around a decade ago, I could earn two to three sacks of tin within a day (1 sack = 50 Kgs) but nowadays finding even 5 Kgs per day is very difficult. I cannot afford the operational cost of a mining site including fuel price, food, and a cigarette, also worker's salary.*

This demonstrates that mining activity was no longer considered as a promising and profitable source of income. Another significant reason as mentioned by one local miner, AH (47 years old), is limited mining ground and the incompatible technology.

Mining land was abundant in the early 2000s. Former mining sites previously extracted by mining companies were still available with a reachable depth. Now, the available land is limited because most of it has been sold to outsiders, and Palm Oil Company.

Extreme depletion of land tin stock, incompatible mining technology, and limited mining grounds were three major changes in the decline of mining perceived by miners. The beginning of coastal mining that emerged, along with declining of land tin stock, influenced livelihood of Selindung Hamlet. Though none engage in coastal mining because it is risky and require high capital, the influx of migrants who work as coastal miners cause social inequality and conflict. The presence of suction-dredging expected to bring prosperity for locals conversely led to intra-community socioeconomic differentiation resulting in local tensions. Though environmental impacts are less important to land miners because they do not directly affect income sources, benefits are not equally distributed among locals. SH, 37 years-old, a local miner, expressed his dislike of suction-dredging operations which gave more benefits to the local elites. He is one of the ordinary residents who have become spectators. He believes outsiders were coming to exploit available resources, earning huge amounts of money, giving advantages only to local elites, not to the whole community.

6.4 Adaptation Strategies deployed to minimize the impacts of tin mining in the study area

Progressive decline in fish yields that lead to income uncertainty is a change observed by fishers. To adapt, fishers applied several strategies to improve fishing technical capabilities, including shifting the *Bagan* fishing ground, diversifying fishing tools, and increasing the number of working hours per day and week. Depleting fish yields lead to income uncertainty, the most prominent adaptation for which was based on seasonal strategies. Livelihood diversification and division of labor were also employed, according to the number of working household members and the capital and assets owned. Adaptation included borrowing money, mortgaging and selling assets (land, home, boat, vehicles) and adjusting daily consumption.

Farmers saw land ownership and income uncertainty as for the main changes affecting their household resilience. Crop rotations and diversification, agricultural technique improvement, and shared-cultivation strategies were applied to boost yields. Farmers also made the same adaptation as fishers, including diversifying sources of income, additional jobs, and migrations. Pepper growing farmers did not work throughout the year like rubber and palm oil farmers. Instead of waiting to harvest pepper, farmers preferred to look for other jobs within or outside the village such as fishing, mining, or any wage labor job to meet their daily needs.

Depleted tin stocks and limited mining ground deplete the financial situation of miners. Improving mining techniques that are compatible with the depth of mining grounds, converting the farming land into mining sites, migrating, and diversifying household livelihoods are among the adaptation strategies of miners. Several constraints affected all fishers, farmers, and miners while successfully adapting to

the changes faced by them. The most prominent constraints are unpredictable weather, limited work options, lack of capital ownership (financial, physical, and human capital), limited water supply, soil quality (farmers only), and limited skill and lack of education. Table 9, illustrates the adaptation strategies employed by the three subsistence groups (fisher, farmer, and miner) to minimize negative impacts of large-scale mining activity.

Table 9 Key adaptation strategies in the study area

No.	Subsistence Group	Changes	Adaptation Strategy	Constraint
1.	Fisher	Depleting Fish Yields	Shifting their *Bagan* Place (Fishing ground)	*Bagan* has limited strength, depth, and distance; high cost of *bagan* construction (price of wood, labor cost); decreased wood quality
			Diverse pattern of fishing activities (fishing instruments; fish targets, seasonal)	Lack of capital (to buy another instrument); limited boat capacity; neighborhood villages being polluted by mining activity; high risk and safety; unpredictable weather
			Increasing the working hours/days	Unpredictable weather, health constraints, *began* work only at night
		Depletion of Income	Seasonal Strategy: Work in agriculture/mining/labor job during west season and; in east season engage in fishing	Unfixed job availability; unfavorable weather; limited options due to skill/ education
			Diversification Strategy: Allocating family to work on own agricultural land or wage laborer to another household; Self-employment by integration with other off-fishing activity such as livestock raising	Availability of alternative income generating strategy options; Lack of willingness; Limited skill and capital; Limited technology Remote hamlet location; low accessibility; Skill and education; Gender limitation, illiteracy
			Networking Strategy: borrowing cash from fishers, family/relatives; taking loan from the fish trader (market)	Financial constraint faced by other fishers and relatives; loan interest from fish trader's high
			Assets and Saving Strategy: mortgaging and selling assets (land, home, boat, vehicles or any other assets)	Hard to define value of access, access to related economic institutions, remote hamlet locations
			Consumption Strategy: reducing consumption of food, secondary needs; grow vegetables, spices yards	Limited alternative affordable food available, number of household members require more food consumption
2.	Farmer	Depleting Crop Yields	Crop Rotations (switching the crop choices)	Low soil fertility; Unpredictable weather; Lack of capital assets; Market access, pest risk, weather risk
			Technology improvement (Fertilizer, land cultivation system)	Limited skill and capital (price of fertilizer, seed)
		Limited land	Crop Diversification (combining pepper and mixed crops; or rubber and mixed crops)	Low fertility of Soil; Lack of capital (high initial and maintenance cost, especially pepper)
			Land sharing with another farmer- Shared Cultivation	Family relation constraint; possibility of distrust and economic-based conflicts
		Income Uncertainty	Seasonal Strategy: for pepper farmer: during harvest time, work on farm; and during non-harvest season: work as wage labor in	Unfixed job availability; Limited options due to skill and education; Family constraint; gender limitation; the number of mining sites have been reduced

			construction site, or as mining labor	rapidly
			Diversification Strategy: Allocate family to work as wage labor on another household or to work as wage labor; Self-employment by altering integration with off-fishing activity such as livestock raising; migration to district capital for wage labor work, or temporal migration to work as miner during non-harvest season	Few options of available job; Lack of willingness; Limited skill, limited capital; Limited technology Remote hamlet location with low accessibility; Skill and education; Gender limitation
			Networking: borrowing from other farmer/family/relatives, borrowing from the land/farm owner, taking loan to bank or any economic institutions; food sharing with neighbor	Financial constraints faced by another farmer, community, or relatives; low literacy; difficulty accessing economic institutions
			Assets and Saving: mortgaging and selling assets (land, home, boat, vehicles, pepper)	Hard to define the value of access, access to related economic institutions, remote hamlet locations
			Consumption Strategy: reducing consumption for secondary needs; reducing food consumption	Limited alternative affordable food available, huge number of household members require more food consumption
3.	Miner	Depleting Tin Stocks	Technology Improvement (bigger machine capacity)	Lack of capital assets cost of the machine and other instruments, cost of renting an excavator, cost of the excavator operator, cost of logistics for workers, etc.
		Limited Mining Ground	Convert available agricultural land into mining ground Join with another miner who has mining ground	Not all miners have land High potential conflict
		Income Uncertainty	Diversification, allocate family to work as wage labor, open kiosk,	Gender constraint Low skill, Illiteracy, limited job option
			Networking: borrowing from other farmer/family/relatives, borrowing from the mine owner	Financial constraint faces by other fishers and relatives; limited access to bank or any economic institution, high interest
			Assets and Saving: mortgaging and selling assets (land, home)	Hard to define the value of access, access to related economic institutions, remote hamlet locations
			Consumption Strategy	Limited alternative affordable food available, the huge number of household members require more food consumption

Socioeconomic differences among the subsistence groups make it interesting to see how differences affect adapting to changes with tin mining extraction. Below, I discuss different combinations of subsistence options among households, and factors shaping the strategies applied.

I categorized each subsistence group strategies into three sub-categories: single-strategy; diversification-strategy; and seasonal strategy. Single-strategy group refer to a household who applied single income source strategy; while diversification-strategy group refers to a household who applied double or multiple strategies by diversifying the livelihood options or allocating household members for another strategy; and finally, those who adopted based on seasonal condition.

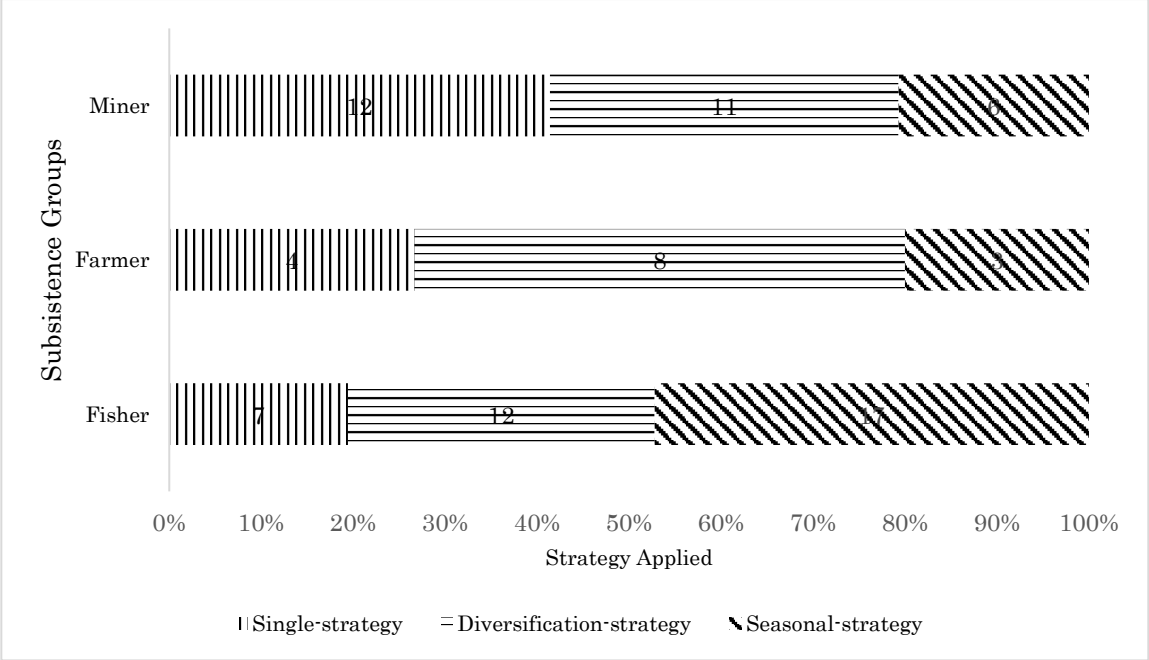

Figure 20 Percentage of Adaptation Strategies Applied by Each Subsistence Group

Seasonal perturbations are part of the fishing community's life. Therefore, as shown in Figure 20, a majority of households (17) employed seasonal strategies because the fishing activity is seasonal. During the *east season*, fishers engage in the fishing activity and shift to other income sources during the *west season*. Other subsistence groups mostly employed diversification-strategy because their activities are not influenced seasonally. The reasons for choosing double or multiple income source strategies differ for each group. A majority of miners, particularly migrants or immigrated for marriage, applied single income strategies because of the absence of land. For others, the reason for applying double or multiple income strategies was driven by poverty or conversely to increase income.

6.5 Discussion

> *In the past time, when there was still plenty of fish yields, every day my husband brought a lot of leftover fish for us and to share with neighbors. But, after tin mining started, even for our consumption it is not always available. Sometimes we able to eat, or often only "have rice with salt" (a parable for a condition of the unavailability of food).* (TG/32 years-old)

TG's insight hints at daily challenges faced by coastal resource-dependent households in Selindung Hamlet following tin mining operations. Changes occurred as the impact of tin mining operations affected the dynamic and socially heterogeneous coastal community livelihoods and was perceived differently among affected locals. There are mechanisms of resilience through which households have tried to adapt and to reduce the shocks and stresses resulting from tin mining while facing constraints.

Scoones (1998) argued that livelihoods of resource-dependent are complex because of their attachment to resources. This is inextricably linked to how community members allocate available resources to make a living, meet needs, cope with uncertainties and respond to opportunities (Blaiki et.al., 2014). The impact of multiple anthropogenic stressors such as declining resource bases and access

and rights to resources challenge livelihood security (Adger et.al., 2011), constantly creating day-to-day uncertainty of survival (Thomas et.al., 2007).

Tin mining has been a driver of irreversible environmental changes affecting the land and livelihoods in Selindung Hamlet. Coastal communities respond to changes in a various way. Locals perceive and respond to changes influenced by the subsistence activity they are engaging with, including socioeconomic structure (Few, 2003), the source of vulnerability (Gallopin, 2006), and assets and property relations (Kofinass and Chappin, 2009). This perspective lends importance to understanding how locals' perception of changes has shaped their decisions.

Fishers' households depend on the coastal ecosystem and are the subsistence group directly affected by suction-dredging operations and small-scale coastal mining. They must bear declining fish quantities leading them to income uncertainty. For farmer and miners, the changes in land tenurial systems and external stressors such as unpredictable tin stocks and weather uncertainty have resulted in challenges to their household resilience.

According to Eriksen et.al. (2005), livelihood strategies are the product of interactions between choice and constraint. Previous scholars, such as Adger et.al. (2009) suggested that adaptation strategy, embedded within the demographical, cultural, and economic background, varies among community groups, depending on local value, attitudes, and expectation of the community. Figure 3 shows fishers' adaptation strategies and ownership of *bagan*. Independent fishers own their *bagan*, while dependent fishers do not but work with independent fishers. Subsistence and cash incomes from 'non-fishing - related resources' complement other sources.

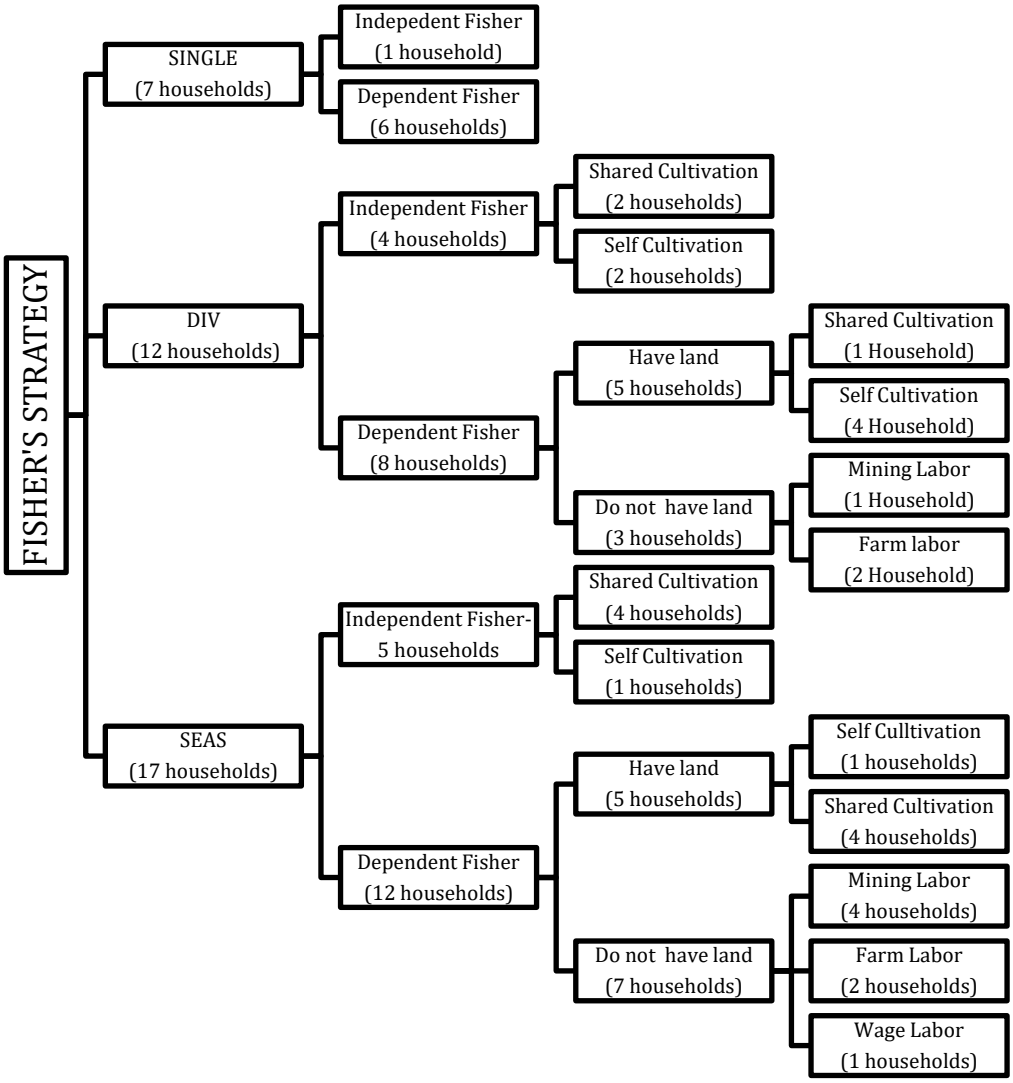

Figure 21 Fishers' Household Strategy

The land is the most fundamental resource to the poor and essential to generating income, accumulating wealth, transferring it between generations, and enabling protection from insecurity. All independent fishers (10 households) who owned land could engage in an agricultural activity for additional income, by either shared or self-cultivation, depending on the household financial state, the size of land, family labor, and household preferences.

Fluctuations in fishing yields are linked to necessity, and limited alternatives and constraints force fishers to use surplus labor resources. Sixty-two percent of landless dependent fishers allocated household members to work in low-paying jobs and half of them frequently send their wives or kids to engage (illegally) in formal or legal enterprise of tin mining as scavenger. They collect "residual" products produced during "cleaning" processes for their own though this type of work activities in tin mining would involve health and safety hazards for them. However, evidence shown that not all fishers who adopt single income strategy decided not to diversify their income source because of economic

incapability. Two out of three independent fishers' households owned two *bags* or more and owned additional properties out of the village (houses and land).

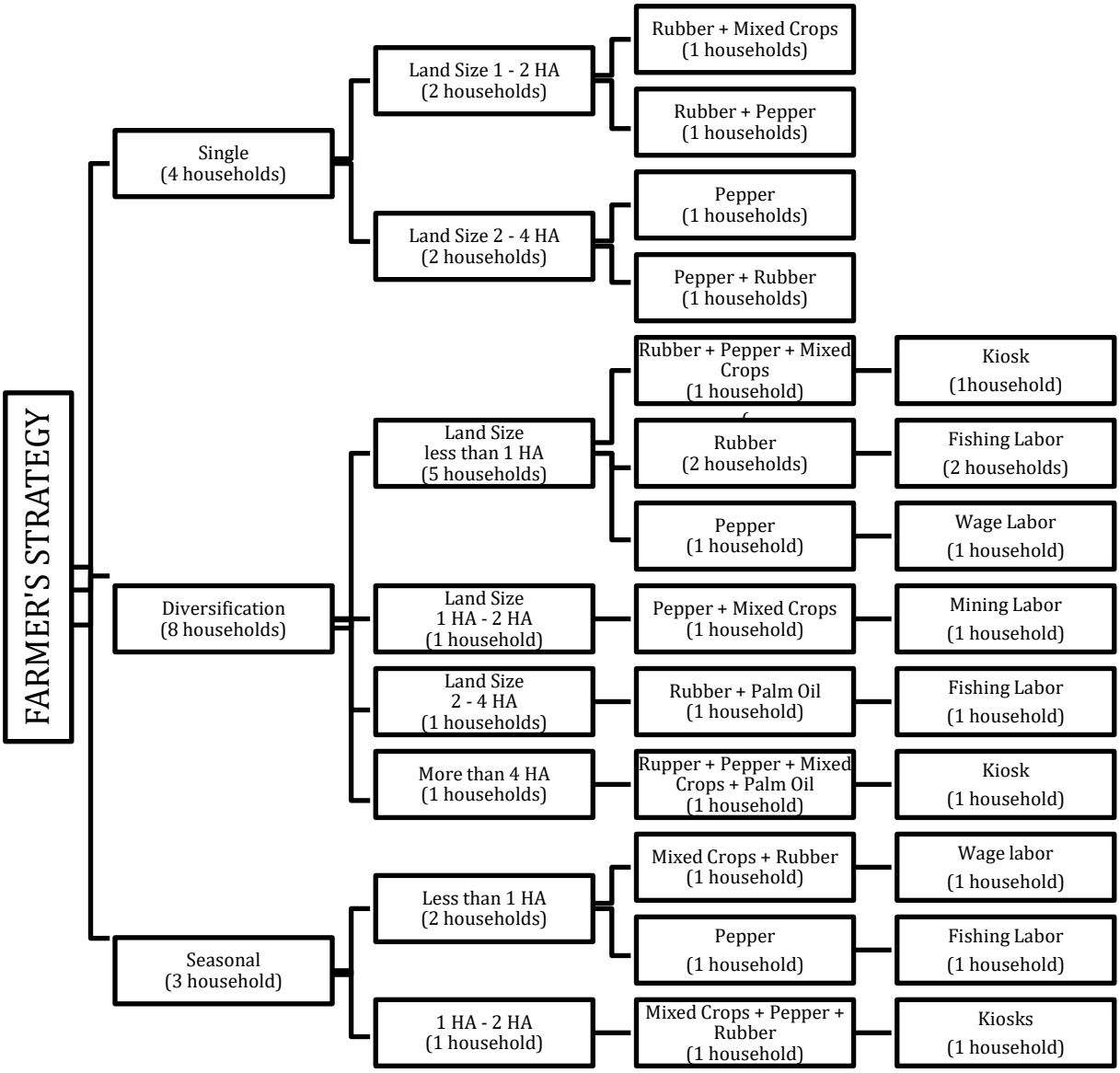

Figure 22 Farmers' Household Strategy

However, capital constraints, including financial, physical, and human, still determined choices for income strategy diversification for other households. Fifty-eight percent of the total fishers who adopted farming as supporting strategy applied shared-cultivation systems with relatives or neighbors for capital support and to reduce the risk the shifting of local values in this hamlet, from mutual to individualistic, might create a significant threat for sharing relationships.

Strategies farmers adopt are differentiated by the land size they own and types of crops they grow (Figure *22*). The larger the land, the more adaptation strategies they can deploy to grow more crops. The greater variety of crops grown, the securer a household is. As suggested by Anik and Khan (2012) crop diversification and land ownership help in adapting effectively. Four households who grow single

crops also have daily wage labor jobs, while farmers growing multiple crops are relatively secure and allocate their capital for investment, such as kiosks. Despite securing land tenure, having viable technologies, access to inputs and extension advice, the availability of labor and financial resources are necessary for farmers` resilience. I found that not all households adopting single income strategies can be regarded as incapable of applying diversification or seasonal strategies. The study of household livelihood trajectories found that two out of four households owning 2-4 hectares' land chose single income generating activity due to limited human labor. They are focusing on cultivating the available land.

For miners, some own mines while other work as laborers (refer to Figure 23). The strategy they adopt differs by their status. Owners must deal with production cost fluctuation and risk of inefficient extraction, while laborers deal with financial loss and security risk. As tin yields and prices are unpredictable and fluctuating, a household owning land would adapt better because it has more options for income. Figure 22 shows that 2/3 of total mine owners own land; while 6/7 of the total mine laborers belong to the landless group. This drives the involvement of women and children to work as scavengers, trapping them in high-risk subsistence activity by extracting the easiest metal and living a precarious existence.

Household survey results show that three out of twelve households and one household out of twelve who applied single strategies were previously engaged in fishing and farming activity before tin mining. Due to land ownership constraints, they could not re-adopt these strategies as supporting income. Unavailability of land forced three miners' households to adopt diversification strategy and one household to adopt non-agricultural seasonal strategies for alternative income sources. The result shows that four out of eleven households were fishers before mining activity, but rapidly depleting income forced three of them to work as fishers. Only one of them decided to work as fishing labor to support the household needs

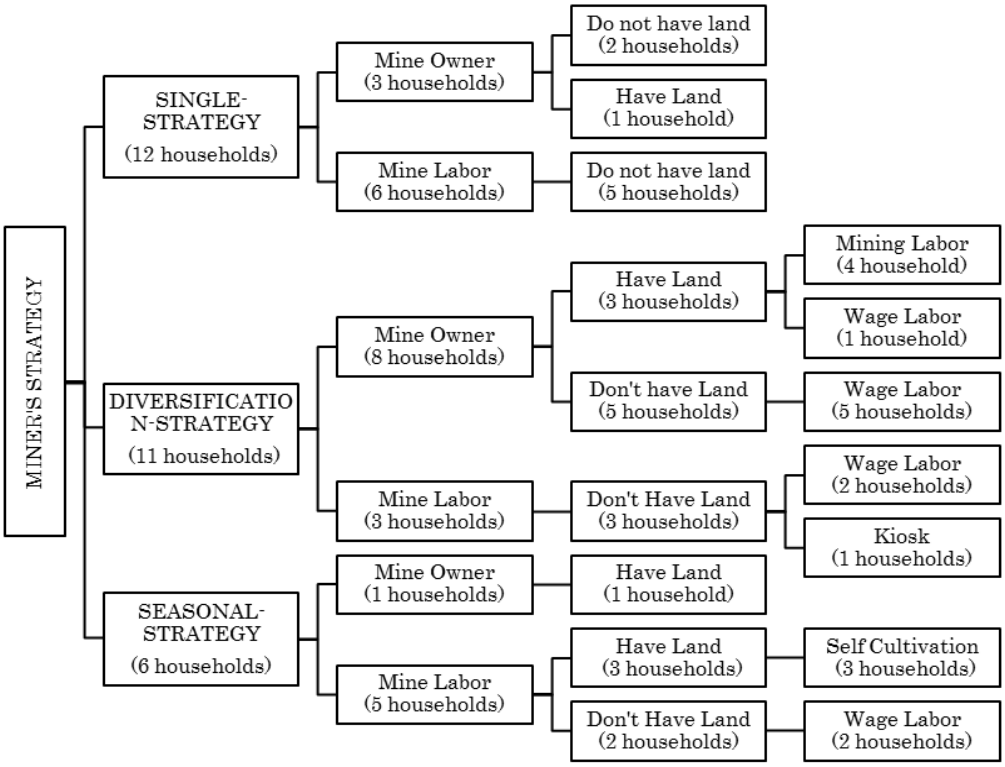

Figure 23 Miners` Household Strategy

In sum, important factors determine income strategies, including physical and financial assets ownership (cash/land); networking and social relations; supporting human resources availability (labours). Households with more assets, larger and stronger networks and human resources are more adaptable. Short-term coping mechanisms through networking, consumption reduction and mortgaging assets may provide options or strategies that help a household or community survive unpredictable changes.

On the other hand, as suggested by Marschke and Berkes (2006) diversification of a household's livelihood can be both reactive and opportunistic when applied by households with no capital or assets. Capital owner households strategize wealth accumulation, while households who deal with fewer resources rely on survival strategies. Given the socioeconomic differentiation within Selindung Hamlet, declining resources and declining access to the resources, barriers to livelihood diversification, limited skills, illiteracy, and low opportunity may force the poor households to focus on narrow survival strategies resulting in resource degradation.

Among all subsistence groups, fishers group is more vulnerable from environmental changes because its economic base, food source, identity, and socio-cultural practices are reliant on coastal resources. This situation is explained by the concept of marginalization suggested by Robbins (2011) wherein the least powerful social groups are made vulnerable to socio-environmental changes. He argued that social inequalities are driven by marginalization limit the livelihood options of marginalized groups, leading them to degrade landscapes and occupy hazardous environments. This constrained their ability to cope and adapt to socio-ecological changes (Robbins 2011).

Facing seasonal perturbations, ever-increasing resource depletion from suction-dredging, dependent fishers who do not own land and income highly depend on the *bagan* owner and are potentially marginalized. Another layer of complexity is added in that the marginality of landless fishers, triggering them to engage in mining activity as an adaptation strategy, leads them to a more vulnerable state. They respond to ongoing changes and livelihood threats by shifting their livelihood from fisheries, engaging in coastal mining through profit-sharing mechanisms with the seasonal migrant miners, or potentially converting the available land into mining land. Nevertheless, engaging in small-scale mining brought them into a major threat of the exposure to health and safety hazards that may be expected at the work place, how they entered for work into the establishment, and the contractual terms (including whether or not an element of coercion prevails).

Linked to socio-economic and ecological issues, adapting to ongoing changes through unsustainable mining activity reflects what was suggested by Adger et.al. (2004), as mal-adaptation state. In addition, this situation also explained by Berkes and Jolly (2002) who found that not all adaptation strategies succeed, and unsuccessful adaptation strategies of a community produced similar results when implemented by another. Conversely, adaptation strategies can increase a community`s vulnerability; instead of helping it deal with ongoing change, they can lead to maladaptation (Adger et. al., 2004). The short time for adaptation may further lead the marginalized groups to adapt less and hinder future choices. Hence, deploying the appropriate strategy is required for a community`s resilience (Brown et.al., 2015).

Although my results are specific to Selindung Hamlet community, they depict the real challenges currently faced by all the coastal region in Bangka Belitung Province affected by tin mining activity. IR's previous studies conducted in West and Central Bangka suggested that current mining policy fails to consider good governance that addresses people-oriented and practical approaches that are necessary to understand the multifaceted problems in complex coastal social-ecological systems.

6.6 Conclusion

The case study of Selindung Hamlet offers a good illustration of how communities living in the coastal ecosystem have been exposed to environmental changes because of their dependence on coastal resources for daily subsistence, livelihoods, and related socio-cultural activity. The spread of tin mining activity on both large and small scales was perceived differently among subsistence groups within this hamlet as the key driver of the coastal ecosystem and land tenure system change, leading them to income uncertainty. Most fishers diversify their income for survival according to seasonally, while farmers and miners rely on diversification through the division of labor. The household economic condition, resources availability and relationships/networking are three important factors influencing the household decision on income diversification. Nonetheless, the lack of capital (physical, financial, human), limited skill, and low education level constrains diversification of income sources. Additional coping mechanisms through networking, consumption reduction and mortgaging assets are considered

short-term, but they provide immediate survival support during unpredictable situations. Agricultural land is considered the most valuable capital, functioning as an alternative livelihood source, but its ownership is concentrated in fewer hands. Thus, landless households struggle to adapt, particularly fishers, who facing ongoing fish depletion yields threatened by suction-dredging and small-scale coastal mining. The landless fishers are potentially marginalized, leading them into maladaptation states, engaging in mining activity which is an economically, socially, and environmentally unsustainable alternative livelihood activity. One of the limitations of this study does not know the effectiveness of the methods adopted. Hence, we encourage researchers to further elaborate these methods. The study concludes that suction-dredging mining activity has resulted in deteriorating local resources and has affected lives and livelihoods, especially of fishers and those who do not own land but are dependent on others for subsistence and survival. A collective effort from all related stakeholders (local elites, the research community, local and provincial government) is needed to facilitate ongoing adaptation in response to threats and future challenges posed by large-scale suction-dredging in Selindung Hamlet.

CHAPTER 7
NATURAL RESOURCES FOR LOCAL PEOPLE'S WELFARE? GOVERNING THE COASTAL TIN RESOURCE: THE SYNTHESIS

Chapter seven is the final chapter and aims to collate all the findings from the case-study chapters 4,5, and 6), whilst providing a strong analytical synthesis based on the specific study objectives. This chapter discusses the tin-resource-governance-pertaining themes that emerged from each case-study undertaken. It specifically evaluates the decision-making mechanism (including the procedures of decision-making, public consultation process, the role of the actors, the resources exchange), factors that influence the acceptance and rejection of large-scale mining operations, and how it impacts the local livelihoods. I want to highlight two major issues found from the key findings presented in chapter 4, 5 and 6 and discuss its implications in the context of decision making and governance. In the concluding part suggests some key recommendations for the existing tin governance arrangements that would improve disputes and contestation among resource users address the democracy and promote effective local participation.

7.1 Two Major Issues: The Highlights

Following the perspectives of Political ecology as postulated by early scholars such as Bryant (1998); Robbins (2001); Zimmerrer and Bassett (2003), I refer natural resource management as the norms, institutions and processes that determine how power and responsibilities over natural resources are exercised, how decisions are taken, and how citizens, men indigenous peoples and local communities participate and benefit from the management of natural resources (Lockwood et.al., 2010; Pahl-Wostl, 2009; Adger et.al., 2003; Rogers and Hall, 2003; Leeach et.al., 1999).

Insights from the discourse of resource management have sparked various discussions based on political control of tin resources that reflects complex governance, involving multilevel actors with diverse power, knowledge, and interests. It is not a novel finding fact that the expansion of extractive sectors has potentially emerged contestations among resources users, generating a critical policy concern for various levels of government. The primary finding suggests that the research extraction will bring about a vast amount of changes, and there have always been trade-offs between economic, environmental and social interests. The literature findings provide insight towards; the impacts of coastal tin extraction activities that can be seen to have tangible impacts not only on ecological dependence but also the emotional wellbeing of the coastal-resource dependent communities. Recent research undertaken has presented that the physical landscape is often deeply intertwined with the local identity and social-economical characteristics of residents. In relation, it is also accurate to state that the coastal ecosystem itself is fundamental.

In the context of coastal tin mining governance, the current intensification of tin extraction development in the coastal area is strongly driven by the depletion of tin stock in the land area, leading to the ecosystem destruction produced as the direct impacts of mining waste disposal in suction dredging technologies. Hence, the tin mining governance has no doubt created challenges, for the local residents who depend on the coastal resource to bring food home to their families, including the traditional fishers. To some degree, this brought dilemma and contestation for all resource beneficiaries due to both tin and fish being situated in the coastal ecosystem, and both must be used for the sake of people's prosperity. However, it is important to note that this contestation is not just a business conflict and not only driven by the economy but also political and power conflicts, varying degrees of interest and power of each stakeholder involved. Each stakeholder is contesting arguments based on laws and regulations and issues for the political power and structures, such as revenue generation issue, social let, mining concession related issue, and furthermore.

From this point of view, the above-mentioned background reflects that problem of resource governance is found to be challenging along with the on-going massive resource extraction both by "big players" or company, or community at the local level. Therefore, this undertaken research was found to be interesting because it captures the coastal tin mining governance pertaining issues focusing on mining company and community tensions. It is worth to note that issues of dredging operations expose a very necessary issue to do with the social dynamics of mining, particularly as it unfolds in Indonesia in this era of decentralization and democratization. Both research sites Selindung (Chapter 5 and 6) and Tanjung Gunung (Chapter 4) were experiencing different sequences of events that reflected the dynamics of coastal resource governance. Investigation showed that both sites provided a wide-angled view of tin-producing regions dealing with extractive development and the potential cumulative impacts upon coastal ecosystem sustainability. Both case-studies reveal that the majority concern of the affected locals was the concentrated local environmental harm that had already resulted from suction dredging operations or would likely eventuate, driving them into a vulnerable state.

At first glance, Tanjung Gunung's case (Chapter 4) presented how the traditional net fishers thwarted an attempt to raise their concerns but the case shows how this backfired and left the fishers disappointed. The outcome resulted in the fishers feeling disempowered and almost out of control over their own futures. The net fishers were highly vulnerable due to the intersection of their fishing grounds and the suction dredger mining ground. Meanwhile, the net fishers who were the ones most affected, faced a dilemma. Most of them were opposed to suction dredging because they knew it would greatly affect their economic activities in the present and the future. However, the local political system paradoxically forced them to agree, and the influences exerted by other parties, and their own insecurity, further pressured them to accept the suction dredgers. Thrust, the conflicting issues were raised at very early stages of the operations, nothing could have been prevented. The findings present how the capabilities to deliver the concern of those opposed to the suction dredging operation were restricted,

showing by little access and opportunity available to participate in decision making. The existing decision-making mechanism employed has neglected the fundamental concerns of the most vulnerable affected net fishers. Consequently, the unsuccessful democratic process or I define here as Immature Democratization arose conflicts that fueled by the increasingly problematic economic and environmental pressures. These conditions proved by the arising local mobilization two weeks after the first day of suction dredger operation in the Tanjung Gunung waters.

Similarly, Selindung (Chapter 5) facts in the findings presented the same ideas such as; the majority of the locals belonged to traditional small-scale fishers, which then meant the intersection between suction dredge operation and the fishing spot was hugely impacted. Furthermore, this fisher's majority of the timed belonged to a laboring class, for all direct consequences imposed on their communities and local environments, the locals received few economic benefits from the mines after four years' operation in Selindung waters. The ineffective and limited public participation in the decision-making process because of capacity constraint and elite domination spawn the grey participations. Thus, they reluctantly accept the suction dredging operations without having proper understanding and knowledge of the impact of suction dredging activity. Additionally, a division of communities over whether to support or oppose suction dredger and the distribution of mine impacts has in some cases fractured social cohesion and negatively affected the stability of the community.

From judging the perspective of the environmental justice, public consultation and democratic decision making it is accurate to claim that the resource is a desirable participatory function. Thus, active participation and fair arrangement are compulsory consents. Notwithstanding, both case studies claimed that management over resources and local development has been driven by the interests of the industry with scant regard for views expressed by those who had concerns about suction dredger companies' activity. This situation is drawn from the failure of the governance institutional arrangement addressing the principle of justice and equity for all the resource users. This is shown by the limited capacity of the community to participate in the decision-making process, particularly the most potentially affected community. By far the most thorough, undemocratic government mechanism that often-privileged industry interest and disregards the importance of local participation further brought the most affected local people marginalized. From this perspective, there are two major issues highlighting the coastal tin governance system drawn from both cases:

1. Unfair decision-making arrangement is shown by the spawn of grey participation and imbalance benefits and impacts distribution framing the immature democratization of coastal tin mining social permit issuance
2. The emergence of multi-pattern marginalization as consequence. The marginalization as a cause occurred within in decision-making process while marginalization as an effect appeared as the consequences of the unfair decision-making process.

7.2 Finding the Gap: Evaluating the Decision-making

Following the aforementioned background, it is essential to notice that the decision – making over resources is beyond important to determine the success or failure of managing the coastal-resource. Somehow, decision-making is considered as a process and an outcome are known as the most fundamental aspect of resource governance discourse. It because decision-making inextricably links the process and outcome on how resources will be used by different users with diverse interest, the degree of power and knowledge. It will further determine who have more and less access, who have more control or less control over the resource. Drawing upon the findings from an environmental justice perspective, it is abundantly clear that in order to gain an equal and effective addressing of concerns for all resource users, fair and effective participation in decision-making institutional arrangement is required. The success or failure of resource governance is determined by how power and responsibilities over natural resource exercised, how the decision was taken, and how community participating in and generating benefit from natural resources. Consequently, good resource governance should reflect the promotion of democracy and local participation.

Through an intense evidence-based-analysis, this study has successfully depicted that the governance institutional mechanisms that failed to meet expectations of justice would consequently constraint the achievement of participatory democracy goals and leading to injustice. Next, in order to evaluate the decision-making process in both cases, I picked some important components within decision-making system: a). Representation and Access; b). Information Transfer; c). Continuity of local participation; d) Benefits and Impacts Distribution (Refer to Table 10)**.**

Table 10 Evaluation of Decision Making Process in Both Research Sites

Component within decision Making Process	Case Study		Consequences
	Case 1: Tanjung Gunung	Case 2: Selindung	
Representation and Access	• Scenario of Public Consultancy Meeting (PCM) Arrangement strongly influenced by power of mining company interest and local government who ensuring the opposition local interest to be effectively side stepped	• Not all community members attended • Prioritization and domination of local elites • Minimal access and opportunities to formal public input, particularly for the politically marginalized locals	Unequal access of representatives, therefore, Public Consultancy Meeting (PCM) process and result does not represent all the voice fairly
Information Transfer	• Livelihood threat information were avoided and not openly disclosed • Strong influence on public sentiment and government responses by restricting the potential argument against mining	• The negligence attitude of company and local government of fair information transfer, particularly on the impacts of suction dredging • Lack of adequate information exchange; technical support; and difficulties in gaining access to clear information could diminish the meaningful voice in decision	Limit the public input while provided greater opportunities for pro-industry to be heard
Local Participation	• Lack both formal and informal opportunities to participate in decision making • Discouragement to actively participate due to potential threat and insecurity; local political setting which gave priority to local elites; rurality and less confidence because of low-level education	• Limited time opportunities, feeling of anxiety and a lack of confidence become the reason of low participation • The hidden motives • Strongest voice acceptance came from the less affected locals	Limited to hearings which did not permit multi directional consultation
Benefits and Impacts Distribution		• Economic benefits become an apparently contentious topic during the PCM • Benefits and impacts were not grossly distributed among all potentially affected locals • Lack recognition of raise place-based concern (emotional and historical attachment)	Local polarization as some locals start realizing the adverse impacts of Suction Dredger Operation

First, Representation and Access; It refers to the representation and access of locals to be involved and to take part in a consultation process within decision-making system mechanism. A closer examination at this point highlights the scenario of public consultancy invitation arrangement deployed

during the first consultation phase of suction dredging proposal, leading to leading to distributive injustice. In order to mold and influence the public sentiment local government, they required to intentionally apply rules to help exclude the unsupportive locals. The influence of the mining company and the power of local government ensuring the opposition local interests to be effectively sidestepped, contrary to political assurances which had promised fair outcomes and fair decision-making processes.

Whilst the decision- making process took place, the local government were supposed to be an exchange and responsible to create a bridge between the community and mining company in order to keep the peace, whilst including an arrangement of the consultancy meeting. However, the local government restricted the communities who sought to object the company's operation. These communities were left politically marginalized whilst being provided with minimal opportunities to a formal public input. Having instructed by the village officer to limit the number of people invited, sub-hamlet chiefs in Tanjung Gunung prioritize the locals who would likely agree and who were likely to disagree were not prioritized in terms of invitations. Though public meetings are aimed to allow all stakeholders to express their ideas, voices, aspirations, and opinions freely, nonetheless, powerful actors use their power and status to frame and muting the public opinion for the sake of their interest.

Deploying this scheme, such scenario's consequently brought hurdles for the equal access of the representatives. Thus, the attendee of public consultancy meeting does not represent all the voices fairly. This circumstance proved how the flawed process was gamed from the beginning, Inviting the local people to their point of view to listen what the company wants to hear and ignore the rest. On behalf of democratization of resource governance, the local and regional authority passed in an effort to centralize access to decision making and stripped away the rights local community. I chose to describe this system as an immature democratization that had a manipulative public deliberation process that made it seem very democratic.

Unlike the situation in Tanjung Gunung (Chapter 4), in Selindung (Chapter 5), local government did not apply a scenario mechanism. All households were verbally invited to the public consultancy meeting, considering the small number of households and settlements located in close proximity. However, the evidence presented that not all community members attended the public consultancy meeting, and most of those who attended did so without actively participating because of the local political setting that gave priority to local elites. Domination of the elite segment of the population, which included the village officer, and other beneficiaries, were taken into confidence because they shared the suction dredging mining company's interests. The restriction of local access, closed-off what many perceived to be their only opportunity to be heard their voices.

Second, Information Transfer; Transparency and accountability of information are fundamental aspects of democratic decision-making context. Information provided to the public must be clear and unambiguous and the public must have sufficient time to consider and comment on the company proposal. Without proper information transfer which is transparent and accountable, capabilities of the

locals to participate in decision making will be constrained. This includes fair and objective information concerning the potential environmental consequences of suction dredging activity. It should be fairly informed to the potentially affected community because understanding the potential negative short and long-term impacts are important for the purpose of proposed mitigation of potential negative impacts and adaptation strategies for future.

Ironically, the evidence presented in both sites express that there was a scientific risk involved, following up with potential threats towards the environment. Whilst, the livelihoods were also under a threat, they were avoided and not openly disclosed. Finding facts in Selindung case-study (Chapter 5) shows that mining company and the local government tend to show their negligence attitude with a focus on convincing people of the benefits without fairly disclosing the potential negative impacts on the environment and how those impacts would affect local livelihoods. Therefore, the community gave their consent without clearly knowing and understanding the short and long-term benefits and impact. From the environmental justice perspective, this negligence is one of the evidence of procedural unfairness. Likewise, in Tanjung Gunung site (Chapter 4), there was more beyond such tactics, the company aimed to mentally secure approval for separate components of development by avoiding the potential objections from the local. Reinforcing the local perception on the necessity of accepting suction dredger for the sake of their hamlet development and their household economy and the influence of public sentiment as well as government responses

Lack of adequate information exchange has been cited as a cause of polarization and adversarial positions among interest groups that limit the public input while provided greater opportunities for pro-industry voices to be heard. Nevertheless, public meetings needed facilitation to encourage dialogue, make sure everyone was heard, and keep things on track, In addition, lack of technical support and difficulties in gaining access to clear information could diminish the public ability to provide a meaningful voice in decisions. Consequently, in both sites, the process of public consultancy ended up with elites' domination. These unequal power relations are inextricably linked with the capabilities gap between the elites and non-elites.

Third, Local participation; By all accounts, a disjuncture between rhetoric and the realities of decision-making process revealed in social permit issuance in both cases weekly promoted equal participation leading to the uneven local participation. Participation in issuing social permit of suction deedger was limited to written submissions and once-off public hearings which did not permit the multi directional consultation. Evidence also shows that the lack of both formal and informal opportunities for participants in the decision-making process also helped shape the outcomes whilst raising issues of the low local recognition, particularly the vulnerable fishers. In such concerns, the powerless local who is indeed the most vulnerable has relatively little voice in decisions which further have significant implications for their livelihoods and for their own quality of life. These concerns were heightened by a list of evidence shown in both cases that not all community members attended the public consultancy

meeting and most attendees did so without actively participating because of the local political setting that gave priority to local elites. Many interviewees in both sites cited their discouragement to actively participate due to potential threat and insecurity. Therefore, those who were considered passive and preferred to follow the majority voice in some cases. In Tanjung Gunung (Chapter 4), there is rurality and in confidence because of low-level education posed as constraints for locals to actively participate.

Similarly, Selindung (Chapter 5) locals` passive public consultancy meeting attendee interviewed expressed that the limited time opportunities, feelings of anxiety and a lack of confidence became reasons for their low participation. As previously discussed in chapter 5, their agreement on suction dredging operations allows them to keep their motives hidden. Therefore, those who had a strong negative response towards the operation were not allowed to express their opinions freely, due to the pressure exerted through other elite stakeholders, and due to the lack of confidence, that arose by being a minority. Even if they went ahead and voted against the proposal, the licensing process will not have been affected, because they are a minority` and their votes would not have been counted as they are seen, politically and economically weak. Thus, they are indifferent to expressing their opinion on suction dredging and accept the operation to obtain compensation. Evidence shows that the strongest voice acceptance came from the locals who are less affected by suction dredging operation. For example, *bubu* fishers in Tanjung Gunung and also the agree on the group who are majority consist of small-scale land miners, while in Selindung, locals who are engaging in small-scale land tin mining are the one who

The evidence collated from the above findings and facts help indicate a great inequity in public participation mechanisms that set well-funded corporate entities, in this case, suction dredging companies against the affected community and interest groups. As the consequences, it directly affects the capability of locals in both sites to participate in the environmental decision-making process and control of outcomes of the environmental decision. In addition to this, the limited participation framework also left the powerless local with fewer bargaining tools to fight for responsible and safe resource extraction. Thus, enhancing local participation over decision making or natural resource as a transformative tool for social change has emerging significant challenges. Fair distribution of participation is intended to produce better decisions, and thus more efficiency benefits to the rest of society. emphasize the participation process as a transformative tool for social change. In addition, citizen involvement is intended to produce better decisions, and thus more efficiency benefits to the rest of society.

***Fourth, Benefits and Impacts Distribution*;** The benefits, as well as the impacts, were both two important chores that helped undermine the contestation of the resources. and Impacts are two important cores that undermine the contestation over resources. Thus, within democratic system concerns on how the arrangement of benefits and impacts will be decided to require greater attention to ensure its fair distribution and avoiding potential conflict upon imbalance distribution. At both sites, investigation

shows that the economic benefits package became an apparently contentious topic during the public consultancy meeting. Participation in decision-making processes was limited to responding to proponent claims about economic benefits, including type and amount of compensations, and potential employment opportunity. Nonetheless, the local control expected to allocate roles, leaving the decision to those who were most impacted, this then helped to act as an important bribery tool, incentivizing those who would then benefit from the extraction to fairly come to an agreement with those in power and withhold the development consent, and share the gains fairly in compensation.

The public consultancy meeting resulted in an agreement based on a set of conditions of operation along with any compensation and profit sharing to be paid for loss, Though, the distributive outcomes of public meeting decision were considered to be grossly unjust by the affected locals, the impact would be disproportionately felt by residents and the measures proposed to mitigate, offset and compensate for losses were considered inadequate given the nature of the potential harms to be suffered. This study, therefore, revealed the impacts and benefits openly, however, this then led to recognizing how the benefits were not equally spread amongst all the villages impacted. Fishers were affected the most because of the overlap of mining and fishing grounds, situation brought about the shift in the community's feelings, resulting in local polarization because some people started realizing that the adverse impacts of suction dredger threatened their livelihoods. Whereas the community members who supported the dredging were primarily the one who did not experience the direct impact caused by the suction dredging operations, and they consider suction dredger as a potential source of future income. Therefore, the results were biased.

In addition, it is important to recognize that coastal resources contribute greatly to local livelihoods, not only in terms of economic resources but also in emotional and historical attachments to the community and their identity as fishers. In connection, the coastal ecosystem in both Tanjung Gunung and Selindung, how diverse, tangible values for some local people and communities beyond their economic livelihood, they are a part of people`s social and cultural identity and are intrinsically connected to their physical and emotional well-being. However, changes in the ecosystem as the consequences of the massive resource extraction by suction dredger operations brought fundamental impacts to the local community attachment with their area, particularly traditional fishers who are hereditarily grown and highly relying on coastal resources.

Yet, the findings and facts present the lack of recognition amongst the non-dominant interest and limited opportunities to raise place-based concerns. A record of the public consultation process in both sites showed that the in many instances, decision-making process gave little attention to non-expert perspective such as local concerns about their attachment to the coastal resource. Public discourse built among locals tends to constrain the opportunities to raised non-economic place-based values and concerns while marginalizing a tangible concern for communities. Nonetheless, the tangible impacts caused by extractive activities strongly influence the ecological dependence and wellbeing of locals,

socio-cultural identity that attached to their place. Thus, the failure of individuals and groups support to influence their future through decision making will disrupt place attachment.

Finally, to summarize, the decision making in social license issuance was about playing politics, rather than governing the resource through providing equal and fair consultation process. As what have been outlined by Weiss (2007) that affected locals should have the opportunity to participate in the process for making that decision. for people to be involved in this decision-making process the communities need to be provided with information, asked for their opinion, given the opportunity to make recommendations or, in some cases, be part of the actual decision-making process (Renn et.al., 1993).

However, from this study, I draw some characteristics reflecting how the unfair decision-making process was drawing upon the following; a). Lack of decision-making tools which adequately address democratic and justice concern, shown by the adequacy of mechanism and opportunities to actively take part in decision making leading to Immature democratic processes; b). Environmental decision makers are generally disconnected from justice; thus, the language of fairness and justice did not embed within the system; c). Privileging the mining company interest and marginalize the vulnerable local`s interests d). Elite's domination in public consultancy; e). Lack of transparency and support in gaining access to clear information

Findings made me notice how this situation relates more to the mining companies promoting deals to the locals who have no choice but to accept, as there is power forcing them to have their hands tied behind their backs and are helpless. Thus, no matter how questionable the application outright, the objection given by affected locals was a 'toothless tiger' that offer no protection to the community concerns towards their attachment with their resources because the local concerns were not given the same priority as the profit potential of resource extraction. It would be fair to state that the public involvement should have acted as a medium to accommodate all stakeholders' views, however, this was not quite possible as some local elites had the control and power over the decision- making the process for mining permits. Immature democratic processes occur when decisions are made without fully consulting all stakeholders, or fully considering the whole village's views. The result is unsuccessful democratization that will possibly lead to a rebellion by unsatisfied stakeholders.

7.3 *Multi-pattern Marginalization*: Marginalization as a Cause and as an Effect

Subsequently to the discussion above in the previous sub-section, I would like to reinforce how the vulnerable were affected and were almost driven to the marginal static. In virtually, all practices and development of the world's capitalistic economy, the most vulnerable groups will always be cast as victims of the whole story called development, whilst the majority of the community examined in the case studies are not generally to be considered as conventionally marginalized people, injustice was nonetheless found in the decision-making framework of social permit issuance. The arising environmental injustice occurred because of the limited participatory opportunities and the exclusion

of their non-dominant interest, influenced by the local political setting. It is shown by the direct consequences of the disparate power relations between coastal communities, suction dredger companies, and governments. This further leads to the centralization of the interests of local ruling elites and potentially marginalizes the interests of lower-level social groups, particularly the most affected groups. It is recognizable that the absence of the active and equal participants from all affected groups is felt. However, disillusioned the social learning opportunity for the community is an underlying principle of the practice of democracy.

Through the lens of marginalization concept, suction dredger was the main driving force that pushed the affected local community into marginal spaces. In fact, the destruction of the coastal ecosystem was serious enough to make fishing no longer a viable livelihood. This then meant facing a dilemma, the net fishers in Tanjung Gunung and Bagan fishers in Selindung were the ones most affected, in the present and also the upcoming future. In other words, among all subsistence groups, fishers group is more vulnerable to environmental changes because its economic base, food source, identity, and socio-cultural practices are reliant on coastal resources. From this viewpoint, I found that marginalization in both research sites occurred in different event sequences and patterns.

The Tanjung Gunung study revealed that the immature democratic process creates conditions that trigger this marginalization. Their agreement on suction dredging operations allowed them to keep their motives hidden. Those who had a strong view of the operation were not allowed to express their opinions, due to the pressure employed by other stakeholders, and their lack of confidence as minorities. Even if they cast their vote against the proposal, the licensing process will not be affected, because they were a minority. Thus, they are indifferent to expressing their opinion on suction dredging and accept the operation to obtain compensation. This situation reflects how public consultancy meeting did not engender public participation but rather was intended to politically marginalize public input

While in Selindung site, the affected locals are marginalized by two potential factors. The first is grey participation within the local decision-making framework regarding the issuance of social permits for mining operations. The second is an imbalance in the distribution of benefits and impacts generated from suction dredger operations. The process of marginalization has further driven because of suction dredger companies, supported by local elites who had the same interests. This enabled them to take advantage of the lack of involvement and understanding of the locals who were at risk of serious potential impacts and threats towards their livelihoods. However, it was not a shock the companies focused on how to attract the communities in order for them to support their ideas, they provided the locals with services they were in need of, without emphasizing the negative side effects of their operations, this was done as a form of bribery. Thus, the community, as a silent attendee, unaware of the real short- and long-term impacts, accepted the suction dredger proposal. People who actively participated and had an influence towards the decision-making process are generally politically strong and receive minimal negative impacts from the suction dredger operations but have more opportunities

to generate cash through participating in the committee. The committee held a strategic position in the village by bridging the locals and the company, particularly relating to the distribution of compensation and royalties. Those who are actively involved and dominate the committee are those who generally do not have an interest in the sustainable management of coastal resources and who strongly support suction dredger operations.

Marginalization of the affected locals in decision-making process consequently brought implications on the decision-making outcomes that potentially drive them into the more vulnerable state, caused by adverse consequences process significantly undermines capacities or opportunities for present and future adaptation due to significant social-ecological changes. This situation can evidently be found in the changes in fishers who are bearing a significant disadvantage because they lack assets, have limited options for alternative income sources and lack knowledge on how to mitigate or adapt to the severe negative impacts of suction dredger operations. Almost two-thirds are day wage fishers with unstable income and slightly less than one-fifth of those day wage fishers do not own land. Accumulating, this condition has forced them to find alternative income sources that are more sustainable, but the illiteracy factor, limited skills, and limited capital have become huge barriers for this marginalized group. In addition, Thus, marginalized landless households struggle to adapt, are driven into mal-adaptation states, engaging in mining activity which is an economically, socially, and environmentally unsustainable alternative to the livelihood activity.

This resulted in increasing demands on the marginal (increasingly limited) productivity of ecosystems. To sum up, marginalization in this study is perceived as cause and as an effect. Once the locals are forced to becoming politically marginalized, it then opens room for more encouragement in becoming both ecologically and economically marginalized as well, as it is a vicious circle.

The marginalization process found in this study is shown in four patterns:

a). They are marginal because they were pushed by the local governance decision-making system to agree upon suction dredging permit that potentially brings severe impacts to their livelihood. Most of the net fishing community disagreed with suction dredging, but the local political system countered and stilled their opposition. The lack of a fair decision-making process for these licenses is indicative of an immature democracy (Chapter 4).

b). They are marginal because of grey participation within the local decision-making framework regarding the issuance of social permits for mining operations. In this study, Grey participation first, not all community groups attended the PCM and most of those who attended did so without actively participating because of the local political setting that gave priority to local elites. The second is the negligence attitude of the company and the local government towards convincing people of the benefits without fairly disclosing the potential negative impacts on the environment and how those impacts would affect local livelihoods. Therefore, the community gave their consent without knowing and understanding the short- and long-term benefits and impacts (Chapter 5).

c). They are marginal because of the imbalance in the distribution of benefits and impacts generated from suction dredger operations; Community members who disagreed with suction dredger operations and who those who were highly dependent on coastal and marine resources were adversely affected by suction dredger operations, while those who agreed were less affected because they did not depend on coastal and marine resources. Consequently, people in the Disagree Group were forced to find alternative sources of income. Those who do not have access to land are considered dependent fishers, and if they have no alternative livelihood, they are vulnerable and potentially marginalized (Chapter 5).

d). They are marginal because social inequalities limited their livelihood options and trigger them to engage with unsustainable mining activity, leading them into mal-adaptation states. Subsequently, this brought them into the more vulnerable state, shown by deprivation of living space of the coastal-resource-dependent community and the conflict over resources (Chapter 6).

7.4 "Decision-Making Arrangements for Demarginalization": Towards Good Mining Governance

The unfair institutional arrangements by the governance during the decision-making process allowed room for concerns of the development of extractive operations, which the led to the failure to address the balance distribution of impacts and benefits and potentially the marginalize affecting the locals. It is shown by *misdistribution* where certain vulnerable groups were disproportionately exposed to environmental risk and harms. Thus, in order to ensure the distributive fair outcomes, fair processes of decision making are necessary. However, the unfair decision-making process on mining permit issuance somehow constrained by the unequal power relations and the authority to make decisions is not so readily put aside. To clarify, it is accurate to claim that despite the efforts to overcome the procedural barriers in the decision-making process, effective participation may be hindered by the ways in which decision-making process are conducted such as whether participants are treated fairly and respectfully.

Figure 24. and Figure 25. provide a comparison between the two governance institutional arrangements in both case studies. It is evident there has been a one-off and one-way public consultation and communication. This situation shows less value on the importance of community engagement and information transparency but lacks to describe 'how' and 'if' this was translated into a participant action. The flow of important information and benefits was centralized in some particular key actors. Where locals who do not belong to elites and who does not have a position as a committee (refer to Selindung Case) were driven into passive and disempowered position. The bridging function that should be ruled by the local government (hamlet, sub hamlet, and also committee) were ineffectively running.

It is important to emphasize the significant differences between Selindung (Chapter 5) and Tanjung Gunung (Chapter 5) cases as shown 24 and 25. I draw There are two significant points from the institutional arrangement employed in each case studies. ***First***, the absence of local institutions such as

fisher associations in Selindung fragmented the locals. On the other hand, in the case of Tanjung Gunung, the role of local institutions such as the fishermen group both Bubu and net fisher is able to provide space for their subsistence group sesame communicates complaints and aspirations. In addition, local institutions also functioned as a unifying community. The effectiveness of the role of the local institution is demonstrated by the protest and blockade in the case of Tanjung Gunung where the community through the representatives of fishers group gathered their strength with other fisher groups from other villages two weeks after the first operation of a suction dredger in Tanjung Gunung.

***Second,* the domination of local and government elites**; Drawn from the finding facts shown in figure 24 and 25 that in both cases Selindung and Tanjung Gunung that in the institutional arrangement schemes, local government and elites who belong as committee hold the central roles that bridge the information and benefits transfer from company to community and community to the company. Both case study shows that power of local government and elites was pivotal to frame the public sentiment and interest notions. This further provides opportunity to the mining company to privately interact and negotiate to encourage governance's outcome, displacing the environmental harm issue with the potential revenue generated from the suction dredging activity. As consequences, this brought constraint to local people to engage them self in fair decision-making process, to participate actively and to put influence in its outcome justly.

It is very evident that within this study the worse-off people both research sites perceive that tin resource governance failures exist in the decision-making mechanism and benefit and impacts distribution. Locals cannot perceive fair involvement in the decision-making process because equity and justice aspects are not within the concerns. Consequently, uneven impacts and benefits distributions emerged following the injustice governance applied. The failure of local government in both sites to fairly bridge the local`s interest and the private`s interest was manifested through their unnatural standpoint. A local government who was supposed to represent their local community, advocating on behalf of their constituencies and enforcing local laws and other legislation over which they have authority were incapable. As already noted, the facts found to express a clear view that the government gives a preferential treatment to large-scale mining operations because they make important contributions to regional foreign exchange and export earnings. Needless to say, these governments are still keen on resolving regional mine community disputes, their actions merely underscoring how the developing world, most of which is highly in debt, is very much at the mercy of large-scale mining activity because of their potential economic contributions.

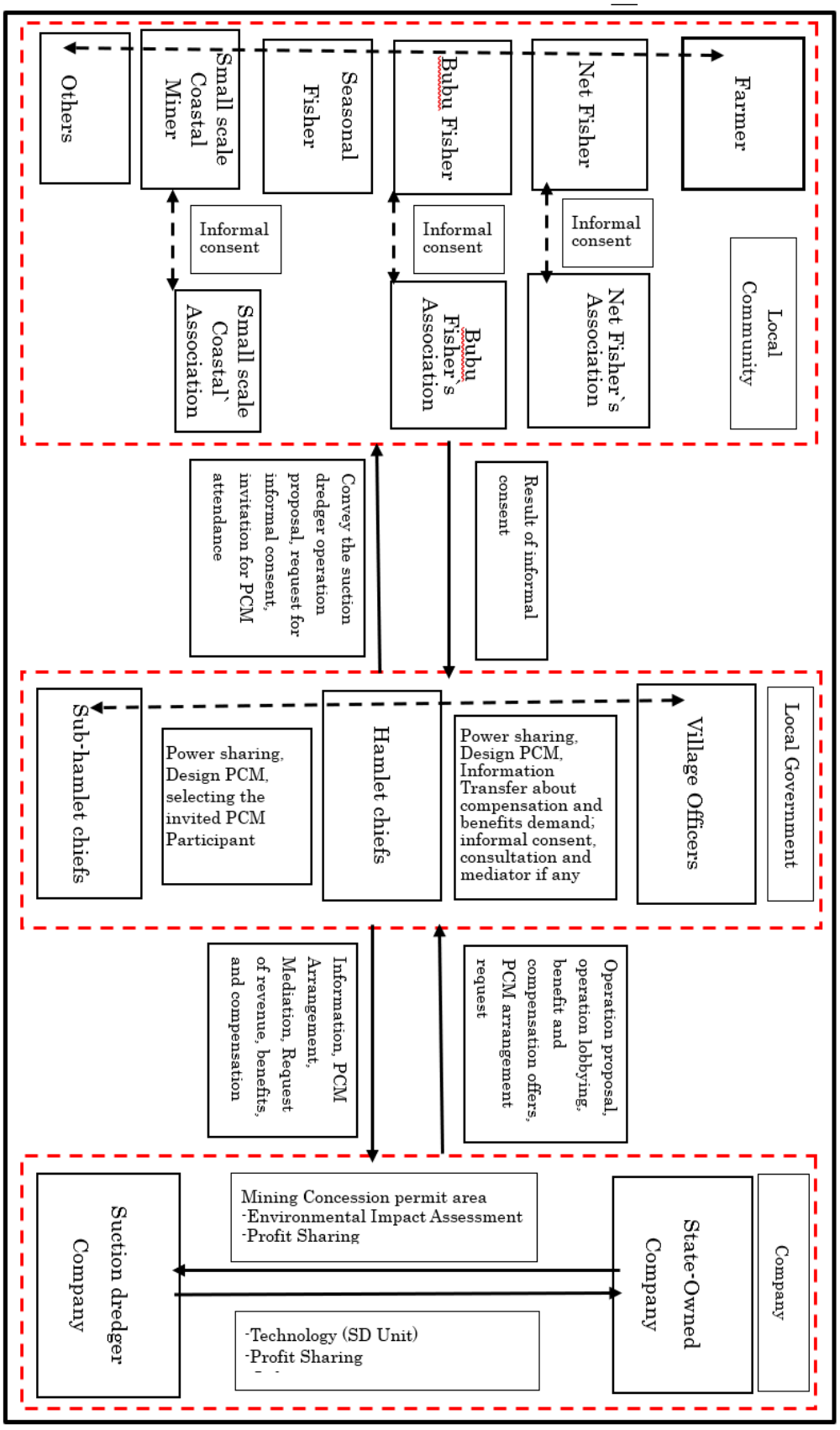

Figure 24. Governance Institutional Arrangements in Tanjung Gunung

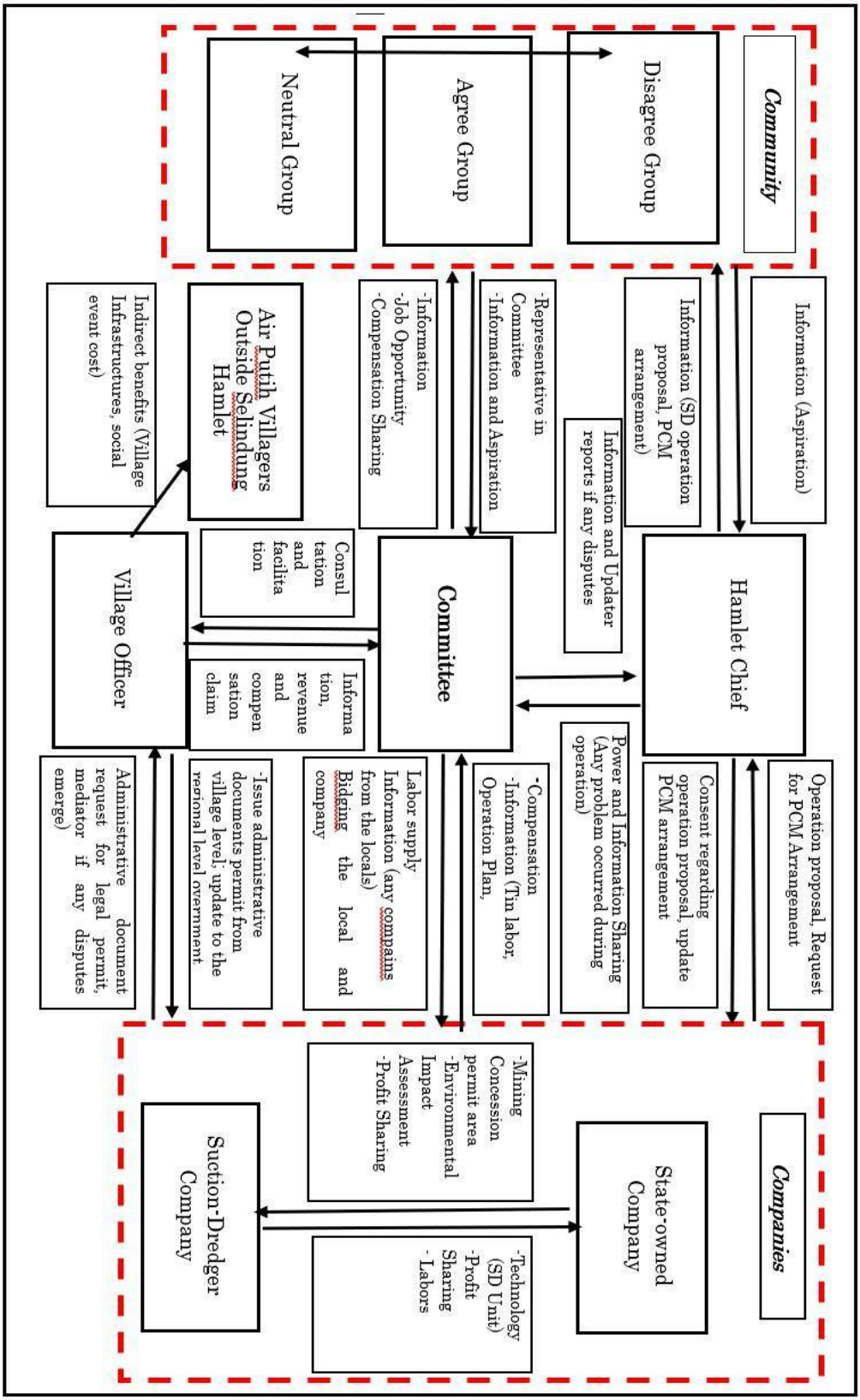

Figure 25. Governance Institutional Arrangements in Selindung

To improve the governance institutional arrangements, it is recommended that the people from the community would all come together and orient towards practical approaches. Firstly, it would be necessary to understand the multifaceted problems in complex coastal social-ecological systems. Decision-making processes for issuing mining permits should seriously consider both justice and equity from the perspective of all related stakeholders to avoid conflicts of interest.

Figure 26. Key Recommendations for Good Tin Mining Governance

The following key recommendations are identified on best practice for suction dredger in Bangka Island (Refer to Figure 27):

Firstly, the ***Public Consultation Enhancement***; This approach helped enhance the public consultation beyond a one-off and one-way meeting perhaps the most obvious and useful of strategies, whereby communities are informed about a formal gathering with the representatives from government, the mine, and local environmental agencies, and where residents can voice their concerns. This would link up to the good intentions of several companies to improve interaction and engagement with local communities. Therefore, rather than seeing consultation as a black-and-white process of achieving a 'yes' or 'no' answer, companies need to view it as a platform for engagement between communities, companies, and governments to achieve a common agreement on the way forward. It could lead to improved community developments initiatives.

The basis for assessing a mining permit should be the community's perspective instead of primarily referring to the company's perspective. A good consultation process takes place in the early stages and allows having a contribution and an effect on project decision and is informed by relevant information that is disseminated in advance. It should be meaningful, inclusive and culturally appropriate and is free from manipulation or coercion. Consultation processes should allow for the sharing of information from all levels of community, and consideration of all views equally based on the evidence shared. Such processes enable a discussion in which all values and positions are relevant.

Furthermore, democratic approaches should be applied with the fundamental assumption that all parties in the discussion want to reach an agreement and not just promote their own interests. Therefore, I suggest that consultation process should design flexibly and with emphasizing on community participation to accommodate customary practices, human rights, and the need to reach shared decisions by enhancing public consultation mechanism, it will avoid the affected locals to the state of politically marginalized.

Secondly, ***Accurate Attitudinal surveys***; I will refer this particular research area towards the process of obtaining baseline information from communities with the specific chapters based on socio-economic impacts and relationship with the local population, environmental impacts, and post-mining landscape restoration and reference to indicators or targets of social and community aspects. Since it is recognizable that communities do not share negative impacts equally, the company should be obligated allocate more benefits and royalties to those who receive more impacts. To provide a reasonable compensation, a pre-assessment on household wealth conditions should be conducted to find their economic condition along with the impacts they receive from mining activity.

Identification of affected groups needs to be based on a robust environmental, social and health impact assessment process, which will identify affected groups, including rights holders and will allow for the assessment of potential impacts and levels of vulnerability of the affected groups. The impact assessment process needs to be discussed in advance with the affected communities so that they trust the outcomes of the process and to minimize the risk of a subsequent challenge to those outcomes. Participatory approaches should be used where appropriate.

This baseline information is gathered from this study, that should have a follow up with clear agreements provided by revenue and compensation distributions and the allocation of social and environmental responsibilities should involve all parties and should ensure fair distribution. Henceforward, accurate attitudinal surveys will provide just access and distribution to the locals according to their real livelihood state. This further will avoid the potential for marginalization.

Third, ***Proper Communication and Information Transfer Platform***; The absence of a fair decision-making system highlights the urgency of improving information disclosures by the government, locals, and companies, and thereby creating a forum in which decision makers can convey ideas and make fair decisions. It is important that communities trust the information that is being gathered and used in making decisions that relate to their future. Thus, Information needs to be gathered and shared in a way that is transparent, locally appropriate, and respectful towards community rights and knowledge systems. The way in which information is presented will be a key part of a deliberative process.

As of this point, I feel to emphasize the importance of a proper communication platform, i.e. a top-down approach, as a way to accommodate local voices. In connection with my previous section, communities are deteriorating because there is no platform to accommodate the least heard voices of

those who are marginalized at the local and regional level. Building proper communication and information platform includes informing people of their rights, writing new laws in clear and accessible language, and translating new legal texts into local languages that can encourage local engagement and local government responsibility.

Fourth, ***Strengthening Local Institutions***; I believe that efficiency and equity benefits of decentralization come from the presence of democratic processes that encourage local authorities to serve the needs and desires of their constituents. Democratic local institutions can improve discern and are more likely to respond to local needs and aspirations because they have better access to information due to their proximity and are more easily held accountable to local populations. It can be manifested through activating the function of subsistence-based local institutions, such as Fisher's group, farmer groups etc. Role of the local institution over a resource is fundamental because: a). natural resources are locally specific, diverse, have multiple uses, and therefore require local knowledge in designing their management, and b). access to natural resources and restrictions to that access involve existing, new, and often multiple overlapping claims that can generate conflicts requiring local mediation.

Therefore, local governments need flexibility when managing the natural resources, using the local knowledge, responding to local needs, and mediating among multiple interests. For these reasons, local authorities need discretionary powers to adapt, act, and react effectively. In relation to this requirement, there are many natural resources uses and management decisions that do not require outside expertise. The responsibility for making those decisions can be transferred to local authorities without threatening social or environmental well-being. In this manner, powers over natural resource management and use can support and be supported by local democratic processes.

Fifth, ***Formation of Liaison Group***; The importance of local institution establishments should be merged by the needs of the establishment of liaison groups, as shown in Selindung Case (Chapter 5) by the committee. These organizations are aimed specifically to interact with the community and provide direct feedback to mine management in order for all ideas and issues to be accommodated. Liaison group will be responsible to accommodate the smaller group consent, before holding the public consultancy meeting to disseminate specific information to each community group such as fishers, miners, etc. In addition, the liaison group is also responsible for assisting the local and company partnerships and ensuring the fair distribution of benefits. However, it is imperative to highlight that the formation of Liaison Groups should be done before public consultancy meeting and should ensure the equal representativeness of local groups to avoid elite's domination Specifically for Selindung, the existing committee should be reviewed its election process and also the work system to ensure the justice.

Sixth, ***Community Development Initiatives***.; It is important to highpoint that one of the goal mining extraction permits issuance is to build community development initiatives that meet the principles of a sustainable community, aimed at benefit sharing from tin-mining and including medium

or long-term improvement of livelihoods. This includes; commitment to a longer-term vision, targets on how to scale ecosystem rehabilitation and enhancing alternative livelihoods for the local community. Developing the locals can be done by a partnership system that links to the process of developing formal links between mineral operations and local schools, which are important when helping a community gain a better knowledge and understanding of the land issues.

Finally, it is important to notice that all of these key recommendations could not be achieved without the seventh point, ***Support Equity, and Justice***. This is the principles of environmental justice, which can result in fairer processes to help produce outcomes that are also seen as fair reducing the likelihood of conflict that will not potentially lead the vulnerable local into marginalized. Additionally, by purely focusing on the capabilities of individuals and communities as a whole, it opens room for gaining the best result of extractive development decisions; the interdependence between humans and the environment is prioritized.

7.5 Rethinking the Tin Mining Governance: A Way Forward

To conclude, decentralization brought about a natural resource paradigm shift from state-centered control towards regional control. Following what has been outlined by Ferrazi and Rohdewohld (2017) that, this paradigm brought power and authority that is transferred from central government to actors and institutions at lower levels such as local or municipal governments, state/provincial governments or regional autonomous governments in a political-administrative and territorial hierarchy. This helped, enable the local communities to become more active participants in decision-making processes of how their local resources are utilized as postulated by Huitema et.al. (2009) that decentralization provides a way to increase both efficiency and equity in natural resource management.

However, this study successfully depicted that for the most part, the decision-making mechanism deployed in the issuance of mining social permit did little to address the primary concerns of all related actors fairly and frequently privileging the interest of mining companies while marginalizing the alternative values and the concerns of affected locals. The failed democratization system resulting in not only the unfair decision-making processes but also the unjust outcomes of decisions, driving the affected into more vulnerable state and potentially marginalized them. The decision-making processes at the local level to accept suction dredging created dilemma within potentially affected communities presented in both case-study sites of coastal-dependent community living in tin mining producing area. This failure can be characterized by the local power dynamics that spawn ‘grey participation’ within local decision-making frameworks and the imbalanced distribution of impacts and benefits from suction dredger operations that shift local people’s perceptions. Locals cannot perceive fair involvement in the decision-making process because equity and justice aspects are not within the concerns. In addition, lack of recognition of non-dominant interest also brought constraint to locals to be fairly involved in decision making. The disparate power relations between local community, government and mining company consequently marginalized the non-dominant interest and privileging the dominant interest to

shape the governance system.

This further justify that both economic and local sociopolitical factors influenced the local communities' decisions of whether or not to accept the suction dredging. The compensation offered provided a compelling reason for the locals that agreed to the mining license permit, while resource depletion and deterioration, and the reduction in the quantity/ price of fish, caused difficulties associating with finding alternative livelihoods were key reasons for opposing suction dredging. At the first research site, Tanjung Gunung, and most of the net fishers' community disagreed with suction dredging, but the local political system countered and stilled their opposition. While in the second research site, locals initially accepted suction dredger operations because they were unaware of the impacts However, governance institutional arrangement did not guarantee active participation in the decision-making process and took advantage of the communities' lack of knowledge and understanding of the purpose of the meetings, and that companies emphasized community benefits rather than the potential adverse impacts caused by suction dredging.

Local community are marginalized because: a). locals were being pushed by the local governance decision-making system to agree upon suction dredging permit that potentially brings severe impacts to their livelihood, unequal access to benefits and impact distribution among all stakeholders; b). locals were pushed to give their consent without knowing and understanding the short- and long-term benefits and impacts, emerging grey participation; c). Locals had to bare with the imbalance in the distribution of benefits and impacts generated from suction dredger operations. d). The locals were driven to social inequalities that limited their livelihood options and triggered them to engage with unsustainable mining activity, leading them into mal-adaptation states. Consequently, this pushed them into an extremely vulnerable state, leaving them helpless. The effect was shown by deprivation of living space of the coastal-resource-dependent community and the conflict over resources. Therefore, when locals are politically marginalized, they will potentially be driven into ecologically and economically marginalized. Deprivation of living space, human rights violation, the conflict over resources will further emerge as the consequences.

From my point of view, the complexities explained through the weaknesses in tin resource governance system provided a big paradox when revisiting the basic constitution of the Republic of Indonesia. This visit helped explain the ideas of natural resources utilization for the welfare and prosperity of the people in the Republic of Indonesia. According to article 33, section 3, written on the basic constitution of the Republic of Indonesia Year 1945, natural resources are under the sovereignty of the state and that their utilization should be maximized in order to bring prosperity to the people of the Republic of Indonesia. This basic philosophical foundation contains a very deep understanding that all people of Indonesia represent multi-ethnics, classes, cultural backgrounds, etc. With all this in mind, they are supposed to have equal rights to derive benefits from the resource available in Indonesia. Following the footsteps of the article 33 basic constitution, Constitutional Court of the Republic

Indonesia has further translated this basic constitution into some practical indicators including a). Ensuring there is a benefit b). Distribution of natural resources will be utilized for the people of Indonesia; c). Recognizing the importance of people`s participation in determining how natural resources will be utilized for their livelihoods. d). Respect for the rights is also fundamental according to this basic philosophical foundation of the resource extraction significant role and potential for ecological, socio-cultural, and economic utilization.

Pursuant to the afore-mentioned and is presented in Figure 26, natural resources available in Indonesia. These resources are expected to be maximally utilized for the purpose of welfare and prosperity of people fairly and justly, however, practically often ceases under state affairs. The state could not genuinely acknowledge that resources must be fully functional for the benefit of society. Even after the decentralization period emerged as the response of centralism governance approach critics, this development-oriented paradigm still practically could not properly promote the local participation and democracy. Therefore, it indicates the failure of both state and regional government in governing natural resources justly. This situation further justifies that the current Indonesian resource governance regime still could not be separated from the feudal systems of the colonial inheritance, emphasizing on the state domination.

The available evidence seems to suggest that some of the identified characteristics reflecting th paradigm of ecological development in the context of Indonesia`s natural resource management (Refer to Figure 26). ***First***, ***the ideology of development puts society as the object of development***, not as the subject of development who has freedom, rights, and integrity. ***Second, the ecological paradigm still mainly prioritizes resources only as an economic asset***. However, the relationship between local communities and resources are not only about benefits and costs deriving from resource extraction, it is also a complex relation that embedding the attachment between local and their resource. Consequently, it is responded by the ***third*** characteristic in which this ***development approach simplifies the relationship between the ecosystem and the society*** by neglecting its non-economic value (social value, cultural, and spiritual value). On particular issues, sometimes locals do not really understand what the purpose behind the development.

The ***Fourth*** characteristic is shown by the current resource governance paradigm which is ***the disconnection between rights and justice***. This point refers to a situation in which arguments have been created for passing a development plan or extractive activity built within public sentiment is the importance of the community's role to contribute to their community and regional development. This point further explained by two important claims given by government upon governing the resources: a). Claim for the nation /Nationalism: the arguments that tin is a valuable resource that will contribute positively to the nation's economy through tax and revenue; and b) Claim to increase the welfare of society: The argument is as follows; by allowing the locals to be involved they will get benefits from the tin extraction through compensation and employment opportunity. However, following these

questions then opens room for others such as; does the society really need such benefits? Does the society need support from outsiders? Does the benefit given to the society match what they need? Facing top-down style development which is not participative, society is consequently, forced to accept development for the sake of the state.

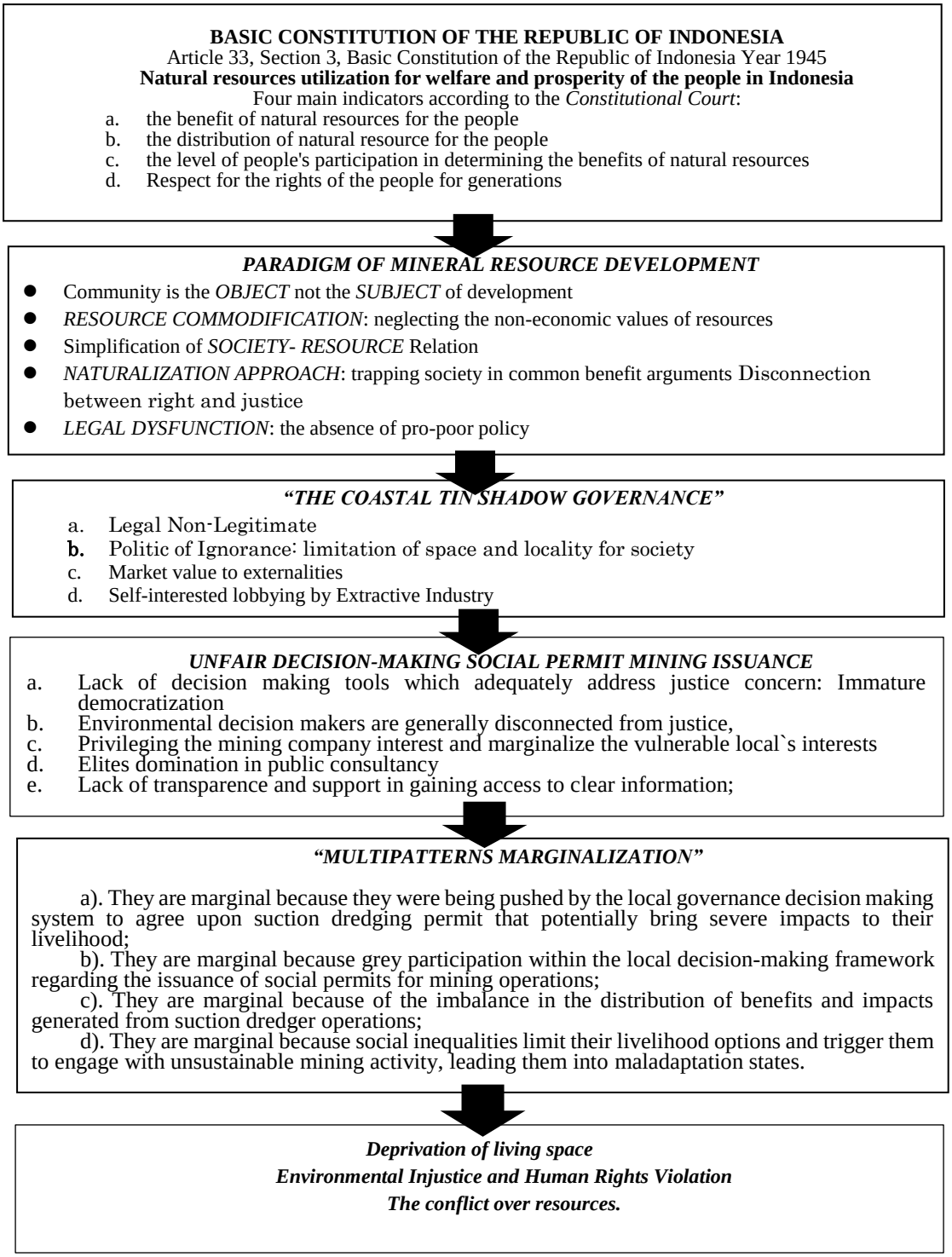

Figure 27 Situating the Resource Governance Issues

Fifth, in addition, ***the absence of pro-locals' law*** was noted as one of the most significant situations, that characterized the current resource extraction paradigm. This refers to the incapability of legislation to provide a proper legal umbrella for protecting the interest of their society. Subsequently, the society interest is determined unilaterally by the state/regional government, obscuring the meaning of the law. In the other words, the law was only used as a tool and rather than a goal or maybe law enforcers only see the law as written laws. This situation has repeatedly presented many cases that derived policy from the issued law disconnects the right of society and the justice.

Drawing from the five points explained above, it is accurate to state that it is accurate to state that development of mineral extraction in Indonesia is largely recognized as one of the most development sector which is politically, socially and economically complex. It has become increasingly apparent that the issue of environmental quality is inextricably linked to that of human equality at all scales. In my point of view, the failure of adopting the resource development paradigm will have an unending loops effect, leading to the unsustainable resource utilization as clearly shown in the context of Tin Mining Governance in Bangka Island. One of the outcomes of the ecological paradigm that emphasizing on economic maximization than the justice is the situation showed the current coastal tin mining development system in Bangka Island is called as "The Coastal Shadow Tin Governance".

My concern in this terminology is to describe the complexity of issues characterized the governance system of large-scale coastal tin mining in Bangka Island. It is an evidence-based-analysis of current conflicts; and this study has demonstrated the coastal shadow tin governance. It has emerged as the failure of tin resource governance in Bangka make novel demands on governance arrangements, the design of which requires normative guidance. In this section, there are characteristics listed that describe; ***the coastal shadow tin governance*** in the context of Bangka Island**.**

First, **Politics of Ignorance**; In the context of Bangka`s tin mining sector, planning and negotiation upon mining permit and operation plan were conducted closely and managed by the bureaucrats and the company, privileging the interest of mining company instead of protecting the affected locals. The resulting tin governance mechanisms seemed to favor the private companies, failing to recognize non-dominant interests.

Second, **Market value to externalities**, processes focused on the economic impacts of tin extractive development, such as quantitative cost-benefit analyses which ascribe market value to externalities, struggling to measure the true cost of social and environmental impacts or obscure them entirely form of compensating impacts rather than sharing the benefit. Citing market efficiencies to justify decisions that impacted social welfare and the environment do not adequately address justice arrangement. Ironically, the environmental impact assessment itself does not clearly represent the factual condition of the potentially affected locals, shown by the absence of clear baseline socio-economic data of the locals. In addition, the way of defining the affected still had no clear rules or standards enabling an ambiguous meaning to arise.

***Third*, Legal Non-Legitimate**, Regulatory and policy mechanism applied for the legal permit of suction dredging mining operations has officially approved both site's large-scale coastal mining operation, but practically these operations have not fully legitimated by the potentially affected local. All the legal procedures required has just become a product for developers to use and to legitimize their plans for purposes of operation project rather than a productive process of management to be engaged with stakeholders throughout phases. The significant capacity of the mining companies is related to fund wide-reaching access to government institutions for lobbying and it further encourages particular governance outcome.

The failure to ensure the integrity of the governance system contributed to a sense of injustice, leading to particular decision becoming critics and in some major cases because of fomented social conflicts. Although the governance principles have been developed for diverse contexts, their availability for sustainable natural resource governance is far too limited. Henceforth, fundamentally, each of the proposed reforms discussed above will point towards the need for a whole of system approach to ensure the effectiveness of the governance system. I suggest that Bangka's government should put efforts to address community concerns and the environmental challenges of tin mining should focus on improving the effectiveness of environmental governance, not only in the current period but also mitigating the post-mining period. In response, a suite of governance principles for natural resource governance can set out overarching `values, norms, and principles for the interaction between the various actors and institutional structures within a governance system. It can establish the conditions for good governance by determining the ground rules of the system in order to improve the ability for the governance mechanisms to become more prone to coping with difficult choices that were often faced in resource use decisions concerning extractive development.

Since effective environmental governance produces outcomes which are beneficial for communities and the environment, policy must focus on expanding and improving the scope of the principles and determinants of effective environmental governance. This also means that the policy focus must aim at constantly improving upon the dialogue processes which enable and enhance an expression of diverse perspectives, shared understanding and appreciation, collective ownership, and equitable distribution of responsibilities. In addition, it is also important to consider the capabilities of individuals and communities and what people can actually do and be as a result of extractive development decisions; the interdependence between humans and the environment had been prioritized. However, the governance processes and mechanisms involve a range of actors with disparate interest, capacities and philosophical orientation. This diversity requires policy and practice to enhance the capacity of socially and politically weaker actors as well as the equitable and proportionate distribution of environmental risks and benefits associated with mining. Indeed, the process of governing the environment must involve a constant revelation of the public interest and public power rather than the power of particular actors or group of actors to the disadvantage of other actors and the environment.

This is likely to result in decisions which enhance the well-being of individuals and their communities as well as the environment.

Understanding governance and rights regimes in Indonesia's coastal tin mining context requires that analysts recognize the rural development dynamics through conceptual lenses that are considerably multi-dimensional. While dominant discourses continue to emphasize a need for law enforcement, this study has emphasized that the multiplication, overlap, and ambiguity in the roles of government institutions, and the lack of understanding about inter-linkages between local labor rights and environmental management, have perpetuated a more fundamental development problem which marginalizing the powerless affected local. The future challenges faced in the research areas are, the mining companies, central government, local government, community councils and environmental NGOs. They should have been cooperating together to formulate a comprehensive plan for rebuilding the lives of the affected local community, especially locals whose life depended on coastal ecosystem. What kind of steps should be taken? How is the anticipation of the transition in the way of living for local people, who have been so influenced by mining activities for around 10 to 30 years? Comprehensive field research must be undertaken, involving all the local stakeholders and in cooperation with external experts from different fields, to achieve a comprehensive re-mapping of local potential and capabilities.

From the academics stand, I encourage scholars to give more attention to how institutions engage the marginalized locals concerns and how such efforts relate to the centralization/decentralization of power and the dynamics of social mobilization and collaboration. Researchers should form partnerships with community-based institutions to encourage adaptive understandings of power imbalances in development planning, and how understandings of local rights discourses *vis-à-vis* mining issues continue to evolve. In addition, civil society organizations and government agencies should pursue development planning in ways that do not marginalize vulnerable locals in the aforementioned ways by championing property rights systems that privilege powerful elites at the expense of local rights claims. Empowering village, sub-district, and district institutions with greater capacities to regulate the mining sector, with clear mandates for assistance and monitoring, should be seen as vital to ensure the idea of justice, democracy and equal participation in guiding decision-making processes that affect them. Ultimately, for effectively mitigating environmental and social risks, that scholars and policymakers honestly come to grips with both the immediately visible and less visible institutional problems of inequity in the mining sector.

References

Adger, W. N. 2003a. Social capital, collective action, and adaptation to climate change. *Economic geography*, *79*(4), 387-404.

Adger, W. N. 2003b. Social aspects of adaptive capacity. *Climate change, adaptive capacity, and development*, 29-49.

Adger, W. N. 2006. Vulnerability. *Global environmental change*, *16*(3), 268-281.

Adger, W. N., Brown, K., Fairbrass, J., Jordan, A., Paavola, J., Rosendo, S., & Seyfang, G. 2003. Governance for sustainability: towards a 'thick'analysis of environmental decisionmaking. *Environment and Planning A*, *35*(6), 1095-1110.

Adger, W. N., Hughes, T. P., Folke, C., Carpenter, S. R., & Rockström, J. 2005. Social-ecological resilience to coastal disasters. *Science*, *309*(5737), 1036-1039.

Agrawal, A., & Gupta, K. 2005. Decentralization and participation: the governance of common pool resources in Nepal's Terai. World development, 33(7), 1101-1114.

Agrawal, A., Gibson, C. C. 1999. Enchantment and disenchantment: The role of community in natural resource conservation. *World Development*, *27*(4), 629–649.

Aguilera, R. V., Rupp, D. E., Williams, C. A., Ganapathi, J. 2007. Putting the S back in corporate social responsibility: A multilevel theory of social change in organizations. *Academy of Management Review*, *32*(3), 836–863.

Aleva, G. J. J., Bon, E. H., Nossin, J. J., & Sluiter, W. J. 1973. A contribution to the geology of part of the Indonesian tin belt: the sea areas between Singkep and Bangka Islands and around the Karimata Islands.

Allison, E. H., Ratner, B. D., Åsgård, B., Willmann, R., Pomeroy, R., & Kurien, J. 2012. Rights‐based fisheries governance: from fishing rights to human rights. *Fish and Fisheries*, *13*(1), 14-29.

Altieri, M. A. 2002. Agroecology: the science of natural resource management for poor farmers in marginal environments. *Agriculture, Ecosystems & Environment*, *93*(1), 1-24.

Anderies, J., Folke, C., Walker, B., & Ostrom, E. 2013. Aligning key concepts for global change policy: robustness, resilience, and sustainability. *Ecology and society*, *18*(2).

Anderson, B. R. G. 1983. Old state, new society: Indonesia's New Order in comparative historical perspective. *The Journal of Asian Studies*, *42*(3), 477-496.

Ansell, C., & Gash, A. 2008. Collaborative governance in theory and practice. *Journal of public administration research and theory*, *18*(4), 543-571.

Armah, F. A., Yawson, D. O., Yengoh, G. T., Odoi, J. O., & Africa, E. K. 2010. Impact of floods on livelihoods and vulnerability of natural resource dependent communities in Northern Ghana. *Water*, *2*(2), 120-139.

Armitage, D. 2006, June. Resilience management or resilient management? A political ecology of adaptive, multi-level governance. In 11th Biennial Conference of IASCP held in Bali.

Ashraf, M. A., Maah, M. J., Yusoff, I. 2012. Chemical speciation and potential mobility of heavy metals in the soil of former tin mining catchment. *The Scientific World Journal*. doi: 10.1100/2012/125608.

Aspinall, C., & Eng, P. 2001. Small-scale mining in Indonesia. *International Institute for Environment and Development, Mining Minerals, and Sustainable Development Report*, *30*.

Bäckstrand, K. 2006. Democratizing global environmental governance? Stakeholder democracy after the World Summit on Sustainable Development. *European Journal of International Relations*, *12*(4), 467-498.

Bagnoli, A., & Clark, A. 2010. Focus groups with young people: a participatory approach to research planning. *Journal of Youth Studies*, *13*(1), 101-119.

Baldwin, W. L. 1983. *The world tin market: political pricing and economic competition*. Duke University Press.

Ballard, C. 2002. *Human rights and the mining sector in Indonesia: a baseline study*. International Institute for Environment and Development.

Ballard, C., & Banks, G. 2003. Resource wars: The anthropology of mining. *Annual review of anthropology*, *32*(1), 287-313.

Barnett, J., O'Neill, S., Waller, S., & Rogers, S. 2013. Reducing the risk of maladaptation in response to sea-level rise and urban water scarcity. *Successful Adaptation to Climate Change: Linking Science and Policy in a Rapidly Changing World*, *37*, 49.

Barrett, C. B., Lee, D. R., & McPeak, J. G. 2005. Institutional arrangements for rural poverty reduction and resource conservation. *World Development*, *33*(2), 193-197.

Batterbury, S. P., & Fernando, J. L. 2006. Rescaling governance and the impacts of political and environmental decentralization: An introduction. World development, 34(11), 1851-1863.

Baumann, P. 2000. *Sustainable livelihoods and political capital: Arguments and evidence from decentralization and natural resource management in India* (p. 136). London: Overseas Development Institute.

Bebbington, A. 2012. Underground political ecologies: the second annual lecture of the Cultural and Political Ecology Specialty Group of the Association of American Geographers. *Geoforum*, *43*(6), 1152-1162.

Bebbington, A., *et al*., 2008. Contention and ambiguity: Mining and the possibilities of development. *Development and Change*, 39(6), 887–914.

Bebbington, A., Hinojosa, L., Bebbington, D. H., Burneo, M. L., & Warnaars, X. 2008. Contention and ambiguity: Mining and the possibilities of development. *Development and change*, *39*(6), 887-914.

Beckford, G. L. 1999. Persistent poverty: underdevelopment in plantation economies of the third world. University of West Indies Press.

Beierle, Thomas C. *Public participation in environmental decisions: an evaluation framework using social goals*. Washington, DC: Resources for the Future, 1998.

Beierle, Thomas C., and Jerry Cayford. *Democracy in practice: Public participation in environmental decisions*. Resources for the Future, 2002.

Berkes, F. 2004. Rethinking community‐based conservation. *Conservation biology*, *18*(3), 621-630.

Berkes, F. 2006. From community-based resource management to complex systems: the scale issue and marine commons. Ecology and Society, 11(1).
Berkes, F., & Ross, H. 2013. Community resilience: toward an integrated approach. *Society & Natural Resources*, *26*(1), 5-20.
Blaikie, P. 2006. Is small really beautiful? Community-based natural resource management in Malawi and Botswana. *World development*, *34*(11), 1942-1957.
Blaikie, P. M., Harriss, J. C., & Pain, A. N. 1985. Public policy and the utilization of common property resources in Tamil Nadu, India. Report to Overseas Development Administration, Research Scheme, so.
Blaikie, P., & Brookfield, H. 1987. Defining and debating the problem. Land degradation and society/Piers Blaikie and Harold Brookfield with contributions by Bryant Allen...[et al.].
Blaikie, P., Cannon, T., Davis, I., & Wisner, B. 2014. At risk: natural hazards, people's vulnerability, and disasters. Routledge.
Blair, H. 2000. Participation and accountability at the periphery: democratic local governance in six countries. *World development*, *28*(1), 21-39.
Bond, C. J. 2014. Positive peace and sustainability in the mining context: beyond the triple bottom line. *Journal of cleaner production*, *84*, 164-173.
Borrini, G., & Jaireth, H. 2007. *Sharing power: learning-by-doing in co-management of natural resources throughout the world*. Earthscan.
Bridge, G. 2008. Global production networks and the extractive sector: governing resource-based development. *Journal of Economic Geography*, *8*(3), 389-419.
Brinkerhoff, D. W. 2007. 5. Enabling environmental partnerships: the role of good governance in Madagascar's forest sector1. *Partnerships, governance, and sustainable development: Reflections on theory and practice*, 93.
Brown, J. D. 2001. Using surveys in language programs. Cambridge: CUP.
Bryant, R. L. 1998. Power, knowledge and political ecology in the third world: a review. Progress in physical geography, 22(1), 79-94.
Bulkeley, H. 2006. Urban sustainability: learning from best practice? *Environment and planning A*, *38*(6), 1029-1044.
Burchell, J., & Cook, J. 2006. Confronting the "corporate citizen" Shaping the discourse of corporate social responsibility. *International Journal of Sociology and Social Policy*, *26*(3/4), 121-137.
Campbell, B. 2012. Corporate Social Responsibility and development in Africa: Redefining the roles and responsibilities of public and private actors in the mining sector. *Resources Policy*, *37*(2), 138-143.
Campbell, S. J., Hoey, A. S., Maynard, J., Kartawijaya, T., Cinner, J., Graham, N. A., Baird, A. H. 2012. Weak compliance undermines the success of no-take zones in a large government-controlled marine protected area. *PloS One*, *7*(11), e50074.
Carpenter, S., Walker, B., Anderies, J. M., & Abel, N. 2001. From metaphor to measurement: resilience of what to what? *Ecosystems*, *4*(8), 765-781.
Chang, W. C. 2011. *Chinese Circulations: Capital, Commodities, and Networks in Southeast Asia*. Duke University Press.
Chuan, G. K., & Cleary, M. 2005. *Environment and Development in the Straits of Malacca* (Vol. 10). Routledge.
Collins, T. W. 2008. The political ecology of hazard vulnerability: marginalization, facilitation and the production of differential risk to urban wildfires in Arizona's the White Mountains. *Journal of Political Ecology*, *15*(1), 21-43.
Collins, T. W. 2010. Marginalization, facilitation, and the production of unequal risk: the 2006 Paso del Norte floods. Antipode, 42(2), 258-288.
Coni-Zimmer, M., Flohr, A., & Jacobs, A. 2016. 6 Claims for local justice in natural resource conflicts. *Fairness and Justice in Natural Resource Politics*, 90.
Conley, A., & Moote, M. A. 2003. Evaluating collaborative natural resource management. *Society &Natural Resources*, *16*(5), 371-386.
Cox, M., Arnold, G., & Tomás, S. V. 2010. A review of design principles for community-based natural resource management.
Creswell, J. W. 1994. Research design: Qualitative and quantitative approaches. Thousand Oaks, CA: Sage.
Creswell, J. W. 2008. Research design: Qualitative, quantitative and mixed methods approach. 3rd edition, Sage Publishers: Los Angeles.
Creswell, J. W., Plano Clark, V. L., Gutmann, M. L., & Hanson, W. E. 2003. Advanced mixed methods research designs. *Handbook of mixed methods in social and behavioral research*, *209*, 240.
Cribb, R., Ford, M. 2009. Indonesia as an archipelago: Managing islands, managing the seas, in Cribb, R., Ford, M. (Eds.), *Indonesia Beyond the Water's Edge: Managing an Archipelagic State*. ISEAS Publishing, Singapore, pp. 1 – 27.
Davidson-Hunt, I. J., & Berkes, F. 2003. Nature and society through the lens of resilience: toward a human-in-ecosystem perspective. *Navigating social-ecological systems: Building resilience for complexity and change*, 53-82.
Davis, R., & Franks, D. M. 2014. Costs of company-community conflict in the extractive sector. *Corporate Social Responsibility Initiative Report. Harvard Kennedy School, Cambridge, USA*.
Davoudi, S., Shaw, K., Haider, L. J., Quinlan, A. E., Peterson, G. D., Wilkinson, C., ... & Davoudi, S. 2012. Resilience: a bridging concept or a dead end?"Reframing" resilience: challenges for planning theory and practice interacting traps: resilience assessment of a pasture management system in Northern Afghanistan urban resilience: what does it mean in planning practice? Resilience as a useful concept for climate change adaptation? The politics of resilience for planning: a cautionary note: edited by Simin Davoudi and Libby Porter. *Planning theory & practice*, *13*(2), 299-333.
Doner, R. F., Ritchie, B. K., & Slater, D. 2005. Systemic vulnerability and the origins of developmental states: Northeast and Southeast Asia in comparative perspective. *An international organization*, *59*(2), 327-361.
Dutton, I. M. 2005. If only fish could vote: the enduring challenges of coastal and marine resources management in post-Reformasi Indonesia, in Resosurdarmo, B. (Ed.), *The Politics and Economics of Indonesia's Natural Resources*. ISEAS Publishing, Singapore, pp. 162–178.

E. Nurtjahya, F. Agustina, A. Akbar, Kajian manfaat social Ekonomi penambangan Timah unconventional dan kerusakan lingkungan dan keanekaragaman Hayati yang ditimbulkannya di Pulau Bangka, Laporan Penelitian Hibah Bersaing, Universitas Bangka Belitung 2008, p.70

E. Nurtjahya, F. Agustina, Managing the socioeconomic impact of tin mining on Bangka Island, Indonesia — preparation for closure. Proceedings Mine Closure 2015, A.B. Fourie and M. Tibbett, L. Sawatsky and D. Van Zyl (eds), Juni 2015, Vancouver, Canada, Australian Centre for Geomech anics, Perth, pp. 817–826. 20.

E. Nurtjahya, U. Umroh, F. Agustina, Impact of tin mining on the biota of Bangka Island, Indonesia – a proof to convince the tin supply chain of smartphone companies. Proceedings Mine Closure 2014, A.B. Fourie, M. Tibbett, and I. Weiersby (eds), October 2014, Johannesburg, SouthAfrica, Australian Centre for Geomechanics, P earth (to be published).

Eng, P. V. D. 2014. Mining and Indonesia's Economy: Institutions and Value Adding, 1870-2010.

Ericson, I., Martí-Cid, R., Nadal, M., Van Bavel, B., Lindström, G., & Domingo, J. L. (2008). Human exposure to perfluorinated chemicals through the diet: intake of perfluorinated compounds in foods from the Catalan (Spain) market. *Journal of agricultural and food chemistry*, *56*(5), 1787-1794.

Erman, E. 2010. Politik Protes dan Etnisitas: Kasus Buruh Cina di Tambang Timah di Bangka-Belitung (1920-1950), in Jurnal Masyarakat Indonesia, Majalah Ilmu-Ilmu Sosial Indonesia, Jakarta: LIPI, 2010.

Erman, E. 2008. Rethinking Legal and Illegal Economy: A Case Study of Tin Mining in Bangka Island. *Southeast Asia: History and Culture*, *2008*(37), 91-111.

Erman, E. 2007. Rethinking legal and illegal economy: A case study of tin mining in Bangka Island. Paper presented at the International Symposium Commemorating 40th Anniversary of *Japan Society for Southeast Asian Studies 86*, 33.

Erman, E., 2007. Renegotiating Boundaries, Asian Studies. KITLV Press Special E-Book Collection, 2007–2012 Vol. 238 Series Verhandelingen van het Koninklijk Instituut voor Taal-, Land- en Volkenkunde, pp. 177–201.

Erman, Erwiza,2007. Deregulasi Tata Niaga Timah dan Pembuatan Negara Bayangan Lokal: Studi Kasus Bangka dalam Politik Lokal di Indonesia, editors: Henk Schulte Nordholt and Gerry van Klinken assisted by Ireen KarangHoogenboom, Jakarta: Yayasan Obor Indonesia-KITLV.

Escobar, A. 2011. *Encountering development: The making and unmaking of the Third World*. Princeton University Press.

Folke, C. 2006. Resilience: the emergence of a perspective for social-ecological systems analyses. *Global Environmental Change* 16:253-267.

Folke, C., Biggs, R., Norström, A., Reyers, B., & Rockström, J. 2016. Social-ecological resilience and biosphere-based sustainability science. *Ecology and Society*, *21*(3).

Forsyth, T. 2004. *Critical political ecology: the politics of environmental science*. Routledge.

Franks, D. M., Davis, R., Bebbington, A. J., Ali, S. H., Kemp, D., Scurrah, M. 2014. Conflict translates environmental and social risk into business costs. *Proceedings of the National Academy of Sciences*, *111*(21), 7576–7581.

Furnivall, J. S. 2010. *Netherlands India: A study of plural economy*. Cambridge University Press.

Giddens, A. 2013. *The third way: The renewal of social democracy*. John Wiley & Sons.

Gifford, B., & Kestler, A. 2008. Toward a theory of local legitimacy by MNEs in developing nations: Newmont mining and health sustainable development in Peru. *Journal of International Management*, *14*(4), 340-352.

Gilpin, A. 1995. *Environmental impact assessment: cutting edge for the 21st century*. Cambridge University Press.

Goldman, M. J., Nadasdy, P., & Turner, M. D. (Eds.). 2011. *Knowing nature: conversations at the intersection of political ecology and science studies*. University of Chicago Press.

Grims portrait of Bangka Belitung Belitung: Demanding Global, National and Local Responsibility to restore Bangka Balitung Islands

Großmann, K., Padmanabhan, M., & von Braun, K. 2017. Contested Development in Indonesia: Rethinking Ethnicity and Gender in Mining. *Austrian Journal of South-East Asian Studies*, *10*(1).

Gunderson, L.H. 2000. Ecological resilience: in theory and application. *Annual Review of Ecology and Systematics*31:425-439.

Hadiz, V. R. 2004. Decentralization and Democracy in Indonesia: A Critique of Neo‐Institutionalist Perspectives. *Development and Change*, *35*(4), 697-718.

Hall, N., Lacey, J., Carr-Cornish, S., Dowd, A. M. 2015. Social license to operate: Understanding how a concept has been translated into practice in energy industries. *Journal of Cleaner Production*, *86*, 301–310.

Hamann, R. 2004. Corporate social responsibility, partnerships, and institutional change: The case of mining companies in South Africa. In *Natural Resources Forum* (Vol. 28, No. 4, pp. 278-290). Blackwell Publishing Ltd.

Hamidi, J. 2015. Management of mining in Indonesia: Decentralization and corruption eradication. *JL Pol'y & Globalization*, *44*, 80.

Hayati, T. 2011. Perizinan Pertambangan di Era Reformasi Pemerintah Daerah Studi tentang Perizinan Pertambangan Timah di Pulau Bangka. Disertasi. Depok: Universitas Indonesia

Heidhues, M. S. 1993. *Chinese Organizations in West Borneo and Bangka: Kongsi and Hui* (pp. 68-88). Armonk, NY and London: ME Sharpe.

Heidhues, M. S. 2017. Bangka in the 1950s: Indonesian Authority and Chinese Reality. *Indonesia*, *103*(1), 1-24.

Heidhues, Mary F. Somers. "Identity and the Minority: Ethnic Chinese on the Indonesian Periphery". In Indonesia Circle n. 70 - SOAS London November 1996: 181-92.

Heidhues, Mary F. Somers. 1992. Bangka Tin and Mentok Pepper, Chinese Settlement on an Indonesian Island. Singapore: Institute of South East Asian Studies.

Hentschel, T., 2003. *Artisanal and small-scale mining: challenges and opportunities*. Died

Heynen, N. C., Kaika, M., & Swyngedouw, E. (Eds.). 2006 *In the nature of cities: urban political ecology and the politics of urban metabolism* (Vol. 3). Taylor & Francis.

Hilson, G. 2012. Corporate Social Responsibility in the extractive industries: Experiences from developing countries. *Resources Policy*, *37*(2), 131-137.
Hilson, G., & Haselip, J. 2004. The environmental and socioeconomic performance of multinational mining companies in the developing world economy. *Minerals & Energy-Raw Materials Report*, *19*(3), 25-47.
Hitch, M., Fidler, C. R. 2007. Impact and benefit agreements: A contentious issue for environmental and aboriginal justice. *Environments Journal*, *35*(2), 49–69.
Homer-Dixon, T. F. 2010. Environment, scarcity, and violence. Princeton University Press.
Holling, C.S. 1973. Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics* 4:1-23.
Holling, C.S. 1986. The resilience of ecosystems: local surprise and global change. Pages 292-317 *in* W.C. Clark and R.E. Munn, editors. *Sustainable development and the biosphere*. Cambridge University Press, Cambridge, UK.
Holling, C.S., 1973. Resilience and stability of ecological systems. Annual Review of Ecology and Systematics 4, 1–23.
Howard, M. C. 1994. Mining, development, and indigenous peoples in Southeast Asia. *Journal of Business Administration*, *22*, 93.
Https://milieudefensie.nl/publicaties/rapporten/grim-portraits-of-tin-mining-on-bangka-belitung-indonesia
Huitema, D., Mostert, E., Egas, W., Moellenkamp, S., Pahl-Wostl, C., & Yalcin, R. 2009. Adaptive water governance: assessing the institutional prescriptions of adaptive (co-) management from a governance perspective and defining a research agenda. *Ecology and society*, *14*(1).
Husnial, Abdullah Husin, Sejarah Perjuangan Kemerdekaan Republik Indonesia di Bangka Belitung, Jakarta: PT. Karya Unipress,, 1983.
Ibrahim, I. 2016. BANGKA TIN, AND THE COLLAPSE OF THE STATE POWER. *GSTF Journal of Law and Social Sciences (JLSS)*, *5*(1).
Indonesia Mining for Development Care (IM4DC Action Research Report). 2013. *Mining and development in Indonesia: An overview of the regulatory framework and policies*. Available at http://im4dc.org/wp-content/uploads/2013/09/Mining-and-Development-in-Indonesia.pdf
Irvin, R. A., & Stansbury, J. 2004. Citizen participation in decision making: Is it worth the effort? *Public administration review*, *64*(1), 55-65.
ITRI Https://www.itri.co.uk/index.php?Option=com_mtree&task=att_download&link_id=55516&cf_id=24
Jenkins, H., & Obara, L. 2006. Corporate Social Responsibility (CSR) in the mining industry–the risk of community dependency. In *Corporate Responsibility Research Conference, Dublin* (pp. 4-5).
Johnson, R. B., & Onwuegbuzie, A. J. 2004. Mixed methods research: A research paradigm whose time has come. *Educational researcher*, *33*(7), 14-26.
Kaliannan, S. 2016. *Light solidification of Kuala Perlis dredged marine soil via admixtures of GGBS–cement, and sand: 1-D compressibility study* (Doctoral dissertation, Universiti Tun Hussein Onn Malaysia).
Kates, R. W., & Haarmann, V. 1992. Where the poor live: Are the assumptions correct? Environment: Science and Policy for Sustainable Development, 34(4), 4-28.
Kaur, A. 2004. Wage Labour in Southeast Asia since 1840. *Globalisation, the International Division of Labour and Labour Transformations, Basingstoke: Palgrave Macmillan*.
Kaur, A., & Diehl, F. 1996. Tin miners and tin mining in Indonesia, 1850–1950. *Asian Studies Review*, *20*(2), 95-120.
Kemp, D., & Owen, J. R. 2013. Community relations and mining: core to business but not "core business". *Resources Policy*, *38*(4), 523-531.
Kemp, D., Owen, J. R., & Van de Graaff, S. 2012. Corporate social responsibility, mining and "audit culture". *Journal of Cleaner Production*, *24*, 1-10.
Kemp, D., Owen, J. R., Gotzmann, N., & Bond, C. J. 2011. Just relations and company-community conflict in mining. *Journal of Business Ethics*, *101*(1), 93-109.
Kennedy, A. 2017. *Environmental justice and land use conflict: The governance of mineral and gas resource development*. Routledge.
Kennedy, A. 2017. *Environmental justice and land use conflict: The governance of mineral and gas resource development*. Routledge.
KIARA (Koalisi Rakyat untuk Keadilan Perikanan). 2013. Nelayan Kepulauan Bangka Belitung Terus Diancam Tambang Timah. Press Release, November 14, 2013. Accessed on April 26, 2016. Available online at https://www.kiara.or.id/2112/
Kofinas, G. P., & Chapin III, F. S. 2009. Sustaining livelihoods and human well-being during social-ecological change. In *Principles of ecosystem stewardship* (pp. 55-75). Springer New York.
Kurniawan, K. R. 2005. The post-crisis Indonesian tin town'. *The International Journal of Environmental, Cultural, Economic & Social Sustainability*, *1*.
La Botz, D. 2001. *Made in Indonesia: Indonesian Workers Since Suharto*. South End Press.
Ladd Anthony E. 2014. "Environmental Disputes and Opportunity-threat Impacts Surrounding Natural Gas Fracking in Louisiana." Social Currents 1:293–312
Lamond, J., Booth, C., Hammond, F., & Proverbs, D. (Eds.). 2011. Flood hazards: Impacts and responses to the built environment. CRC Press.
Lane, M. B., McDonald, G. T., & Morrison, T. H. 2004. Decentralisation and environmental management in Australia: a comment on the prescriptions of the Wentworth Group. *Geographical Research*, *42*(1), 103-115.
Larson, A. M., & Soto, F. 2008. Decentralization of natural resource governance regimes. *Annual review of environment and resources*, *33*.
Larson, A. M., & Soto, F. 2008. Decentralization of natural resource governance regimes. *Annual review of environment and*

resources, *33*.
Leach, M., Mearns, R., & Scoones, I. 1999. Environmental entitlements: dynamics and institutions in community-based natural resource management. *World development*, *27*(2), 225-247.
Lebel, L., Anderies, J., Campbell, B., Folke, C., Hatfield-Dodds, S., Hughes, T., & Wilson, J. 2006. Governance and the capacity to manage resilience in regional social-ecological systems. *Ecology and Society*, *11*(1).
Lemos, M. C., & Agrawal, A. 2006. Environmental governance. *Annual review of environment and resources*, *31*.
Lesser, P., Ejdemo, T., Suopajärvi, L., Petrétei, A. 2017. *SusMinNor: Sustainable mining in the northernmost Europe– lessons learned and practices developed*. Available at http://docplayer.net/53501873-Sus-min-nor-sustainable-mining-in-the-northernmost-europe-lessons-learned-and-practices-developed.html
Liu, J., Dietz, T., Carpenter, S. R., Folke, C., Alberti, M., Redman, C. L., ... & Taylor, W. W. 2007. Coupled human and natural systems. *AMBIO: a journal of the human environment*, *36*(8), 639-649.
Lockwood, M., Davidson, J., Curtis, A., Stratford, E., & Griffith, R. 2010. Governance principles for natural resource management. *Society and natural resources*, *23*(10), 986-1001.
Lowe, C. 2000. Global markets, local injustice in Southeast Asian seas: the live fish trade and local fishers in the Togean Islands of Sulawesi. *People, plants, and justice: the politics of nature conservation. Columbia University Press, New York*, 234-258.
Magnan, A. K., Schipper, E. L. F., Burkett, M., Bharwani, S., Burton, I., Eriksen, S., ... & Ziervogel, G. 2016. Addressing the risk of maladaptation to climate change. *Wiley Interdisciplinary Reviews: Climate Change*, *7*(5), 646-665.
Mainguy, C. 2011. Natural resources and development: The gold sector in Mali. *Resources Policy*, *36*(2), 123-131.
Manap, N. 2008. Common problems encountered by Malaysian dredging stakeholders, the recommendation and relation to the Environment. Doctoral dissertation, Universiti Putra Malaysia.
McLellan, B. C., Corder, G. D., Giurco, D., & Green, S. 2009. Incorporating sustainable development in the design of mineral processing operations–Review and analysis of current approaches. *Journal of Cleaner Production*, *17*(16), 1414-1425.
Mining and The Environment In Indonesia: Long-Term Trends And Repercussions Of The Asian Economic Crisis. EASES Discussion Paper Series November 2000. https://Commdev.Org/Userfiles/Files/877_File_Mining_And_The_Environment.Pdf
Mujiyanto, S., Tiess, G. 2013. Secure energy supply in 2025: Indonesia's need for an energy policy strategy. *Energy Policy*, *61*, 31–41.
Muslih, K. 2014. *The effect of tin mining on the diversity of river fish and indigenous knowledge of the local community in Bangka Island*. Bogor, Institut Pertanian
National Research Council. 2008. Public participation in environmental assessment and decision making. National Academies Press.
Neilson, J. 2016. A political–economic history of environment and resources. *Routledge Handbook of the Environment in Southeast Asia*, 374.
Ogundiya, I. S. 2010. Democracy and good governance: Nigeria's dilemma. *African journal of political science and international relations*, *4*(6), 201.
O'Mahony, S., & Ferraro, F. 2007. The emergence of governance in an open source community. *Academy of Management Journal*, *50*(5), 1079-1106.
Onwuegbuzie, A. J., & Leech, N. L. 2004a. On becoming a pragmatic researcher: The importance of combining quantitative and qualitative research methodologies. Manuscript submitted for publication
Ostrom, E., Burger, J., Field, C. B., Norgaard, R. B., & Policansky, D. 1999. Revisiting the commons: local lessons, global challenges. *science*, *284*(5412), 278-282.
Owen, J. R., & Kemp, D. 2013. Social license and mining: A critical perspective. *Resources Policy*, *38*(1), 29-35.
Pahl-Wostl, C. 2007. Transitions towards adaptive management of water facing climate and global change. *Water resources management*, *21*(1), 49-62.
Pahl-Wostl, C. 2009. A conceptual framework for analyzing adaptive capacity and multi-level learning processes in resource governance regimes. *Global Environmental Change*, *19*(3), 354-365.
Parsons, R., Lacey, J., & Moffat, K. 2014. Maintaining legitimacy of a contested practice: How the minerals industry understands its 'social license to operate'. *Resources Policy*, *41*, 83-90.
Pimbert, M. P., & Pretty, J. N. 1997. Parks, people, and professionals: putting 'participation into protected area management. *Social change and conservation*, *16*, 297-330.
Pomeranz, K. 2009. *The great divergence: China, Europe, and the making of the modern world economy*. Princeton University Press.
Prior, T., Giurco, D., Mudd, G., Mason, L., & Behrisch, J. 2012. Resource depletion, peak minerals and the implications for sustainable resource management. *Global Environmental Change*, *22*(3), 577-587.
Prno, J. 2013. An analysis of factors leading to the establishment of a social license to operate in the mining industry. *Resources Policy*, *38*(4), 577–590.
Prno, J., & Slocombe, D. S. 2012. Exploring the origins of 'social license to operate'in the mining sector: Perspectives from governance and sustainability theories. *Resources Policy*, *37*(3), 346-357.
Prno, J., Slocombe, D.S., 2012. Exploring the origins of social license to operate in the mining sector: perspectives from governance and sustainability theories. *Resources Policy*, *37*(3), 346–357.
Ratner, B. D. 2003. The politics of regional governance in the Mekong River Basin. *Global Change, Peace & Security*, *15*(1), 59-76.
Reed, M. S., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., ... & Stringer, L. C. 2009. Who's in and why? A

typology of stakeholder analysis methods for natural resource management. *Journal of environmental management*, *90*(5), 1933-1949.
Renn, O., Webler, T., & Wiedemann, P. M. (Eds.). 1995. *Fairness and competence in citizen participation: Evaluating models for environmental discourse* (Vol. 10). Springer Science & Business Media.
Renn, O., Webler, T., Rakel, H., Dienel, P., & Johnson, B. 1993. Public participation in decision making: A three-step procedure. *Policy sciences*, *26*(3), 189-214.
Resosudarmo, B., Resosudarmo, I. D., Sarosa, W., & Suleiman, N. 2009. Socioeconomic conflicts in Indonesia's mining industry. In *Exploiting natural resources: growth, instability, and conflict in the Middle East and Asia*. Stimson Center.
Resosudarmo, I. A. P. (2004). Closer to people and trees: will decentralization work for the people and the forests of Indonesia? *The European Journal of Development Research*, *16*(1), 110-132.
Ribot, J. 2002a. *Democratic decentralization of natural resources: institutionalizing popular participation*. Washington DC: World Resources Institute.
Ribot, J. C. 2002b. *African decentralization: local actors, powers, and accountability*. Geneva: UNRISD.
Ribot, J. C. 2003. Democratic decentralization of natural resources: institutional choice and discretionary power transfers in Sub‐Saharan Africa. *Public administration and development*, *23*(1), 53-65.
Ribot, J. C., Lund, J. F., & Treue, T. 2010. Democratic decentralization in sub-Saharan Africa: its contribution to forest management, livelihoods, and enfranchisement. *Environmental Conservation*, *37*(1), 35-44.
Richards, J. C. & Schmidt, R. 2002. Longman dictionary of language teaching and applied linguistics. Third ed. London: Longman.
Robbins, P. 2011. *Political Ecology: A Critical Introduction* (2nd ed.). Oxford, Wiley-Blackwell.
Robinson, W. C. 2003. Risks and rights: The causes, consequences, and challenges of development-induced displacement. *Occasional Paper*.
Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., ... & Nykvist, B. 2009. A safe operating space for humanity. *nature*, *461*(7263), 472-475.
Rogers, P., & Hall, A. W. 2003. *Effective water governance* (Vol. 7). Global water partnership.
Rolfe, J., Miles, B., Lockie, S., & Ivanova, G. 2007. Lessons from the social and economic impacts of the mining boom in the Bowen Basin 2004-2006. *Australasian Journal of Regional Studies*, *13*(2), 134.
Rosenau, J. N. 1995. Governance in the Twenty-first Century. *Global governance*, *1*(1), 13-43.
Ross, C. 2014. The Tin Frontier: Mining, Empire, and Environment in Southeast Asia, the 1870s–1930s. *Environmental History*, *19*(3), 454-479.
Saha, S., Pattanayak, S. K., Sills, E. O., & Singha, A. K. 2011. Under-mining health: environmental justice and mining in India. *Health & Place*, *17*(1), 140-148.
Sangaji, Arianto, 2002. "Japanese Involvement in Nickel Mining Indonesia", a Discussion Paper Prepared for Japanese NGOs in Tokyo, 2002 July 18th. The Meeting was organized by NINDJA (Network for Indonesia Democracy, Japan) and Friends of Earth Japan.
Scheffer, M. 2009. *Critical transitions in nature and society*. Princeton University Press, Princeton, New Jersey, USA.
Scheraga, J. D., & Grambsch, A. E. 1998. Risks, opportunities, and adaptation to climate change. *Climate research*, *11*(1), 85-95.
Schlosberg, D. 2009. *Defining environmental justice: Theories, movements, and nature*. Oxford University Press.
Schwartz, M. O. 1990. Greisenization and albitization at the Tikus tin-tungsten deposit, Belitung, Indonesia. *Economic Geology*, *85*(4), 691-713.
Shaw, A., & Welford, R. 2007. Polluting the facts? A second case study of gold mining in Indonesia. *Corporate Social Responsibility and Environmental Management*, *14*(5), 289-297.
Shah, H. 1996. Modernization, marginalization, and emancipation: Toward a normative model of journalism and national development. Communication Theory, 6(2), 143-166.
Shaw, A., & Welford, R. 2007. Polluting the facts? A second case study of gold mining in Indonesia. Corporate Social Responsibility and Environmental Management, 14(5), 289-297.
Singawinata, I. P. 2007. The Future of the Indonesian Mining Industry: Recommendations to Policy Makers.
Siry, H. Y. 2011. In search of appropriate approaches to coastal zone management in Indonesia. *Ocean & Coastal Management*, *54*(6), 469–477.
Smit, B., & Wandel, J. 2006. Adaptation, adaptive capacity, and vulnerability. Global environmental change, 16(3), 282-292.
Smith, B. C. 2007. *Good governance and development*. Palgrave Macmillan.
Sneddon, C., Howarth, R. B., & Norgaard, R. B. 2006. Sustainable development in a post-Brundtland world. *Ecological economics*, *57*(2), 253-268.
Sosa, I., & Keenan, K. 2001. *Impact benefit agreements between aboriginal communities and mining companies: Their use in Canada* (p. 2). Ottawa: Canadian Environmental Law Association.
Spiegel, S. J. 2012. Governance institutions, resource rights regimes, and the informal mining sector: Regulatory complexities in Indonesia. *World Development*, *40*(1), 189–205.
Spradley, J. P. 2016. *Participant observation*. Waveland Press.
Steffen, W., Grinevald, J., Crutzen, P., & McNeill, J. 2011. The Anthropocene: conceptual and historical perspectives. *Philosophical Transactions of the Royal Society of London A: Mathematical, Physical and Engineering Sciences*, *369*(1938), 842-867.
Stoker, G. 1998. Governance as theory: five propositions. *International social science journal*, *50*(155), 17-28.
Sujitno, Sutedjo, Dampak Kehadiran Timah Indonesia Sepanjang Sejarah, Jakarta: PT. Gramedia Pustaka Utama, 2007.
Sujitno, Sutedjo. 1996. Sejarah Timah Indonesia. Jakarta: Gramedia

Susilo, Joko & Siti Maemunah, Tiga Abad Melayani Dunia, Potret Tambang Timah Bangka Belitung, Jakarta: Jaringan Advokasi Tambang (JATAM), 2009.
Taylor, S. J., & Bogdan, R. 1984. Introduction to qualitative research methods: The search for meaning.
Tompkins, E., & Adger, W. N. 2004. Does adaptive management of natural resources enhance resilience to climate change? *Ecology and society*, *9*(2).
Torry, W. I., Anderson, W. A., Bain, D., Otway, H. J., Baker, R., D'Souza, F., ... & Watts, M. 1979. Anthropological studies in hazardous environments: Past trends and new horizons [and Comments and Reply]. Current anthropology, 20(3), 517-540.
Tschakert, P., & Singha, K. 2007. Contaminated identities: Mercury and marginalization in Ghana's artisanal mining sector. Geoforum, 38(6), 1304-1321.
Turner, R. K., & Daily, G. C. 2008. The ecosystem services framework and natural capital conservation. *Environmental and Resource Economics*, *39*(1), 25-35.
Urkidi, L., & Walter, M. 2011. Dimensions of environmental justice in anti-gold mining movements in Latin America. *Geoforum*, *42*(6), 683-695.
Vélez-Torres, I. 2014. Governmental extractivism in Colombia: Legislation, securitization and the local settings of mining control. *Political Geography*, *38*, 68-78.
Wagner, G. P., & Altenberg, L. 1996. Perspective: complex adaptations and the evolution of evolvability. *Evolution*, *50*(3), 967-976.
Walker, B., & Salt, D. 2012. *Resilience practice: building capacity to absorb disturbance and maintain function*. Island Press.
Walker, G. P., & Bulkeley, H. 2006. Geographies of Environmental Justice. Geoforum, 37(5), 655-659.
Walker, B., Carpenter, S., Anderies, J., Abel, N., Cumming, G., Janssen, M., ... & Pritchard, R. 2002. Resilience management in social-ecological systems: a working hypothesis for a participatory approach. *Conservation ecology*, *6*(1).
Walker, G. 2012. *Environmental justice: concepts, evidence, and politics*. Routledge.
Watts, M. 1983. Hazards and crises: A political economy of drought and famine in Northern Nigeria. *Antipode*, *15*(1), 24-34.
Watts, M., & Peet, R. 2004. Liberating political ecology. *Liberation ecologies: Environment, development, social movements*, *2*, 3-43.
Weiss, T. G. 2000. Governance, good governance, and global governance: conceptual and actual challenges. *Third world quarterly*, *21*(5), 795-814.
Wijkman, A., & Rockström, J. 2012. *Bankrupting nature: Denying our planetary boundaries*. Routledge.
Withington, W. A. 1967. The Major Geographic Regions of Sumatra, Indonesia. *Annals of the Association of American Geographers*, *57*(3), 534-549.
Wisner, B., Blaikie, P., Cannon, T., & Davis, I. 2004. At risk. Natural hazards, people's vulnerability and disasters, 2.
Zimmerer, K. S., & Bassett, T. J. (Eds.). 2003. *Political ecology: an integrative approach to geography and environment-development studies*. Guilford Press.
Zohrabi, M. 2013. Mixed method research: Instruments, validity, reliability and reporting findings. *Theory and Practice in Language Studies*, *3*(2), 254.
Badan Pusat Statistika. 2017. Statistik Daerah Kepulauan Bangka Belitung 2017.http://babel.bps.go.id/backend/pdf_publikasi/Statistik-Daerah-Provinsi-Kepulauan-Bangka-Belitung-2017.pdf
Badan Pusat Statistika. 2017.Propinsi Kepulauan Bangka Belitung Dalam Angka 2017.http://babel.bps.go.id/backend/pdf_publikasi/Provinsi-Kepulauan-Bangka-Belitung-Dalam-Angka-2017.pdf.
Badan Pusat Statistika. 2017. Kabupaten Bangka Tengah Dalam Angka 2017. https://bangkatengahkab.bps.go.id/backend/pdf_publikasi/Kabupaten-Bangka-Tengah-Dalam-Angka-2017.pdf
Badan Pusat Statistika. 2017. Kabupaten Bangka Barat Dalam Angka 2017. https://bangkabaratkab.bps.go.id/beckend/pdf_publikasi/Kabupaten-BANGKA-BARAT-DALAM-ANGKA--2017.pdf
Kementrian Dalam Negeri Republik Indonesia. 2016. Profil Propinsi Kepulauan Bangka Belitung, http://www.kemendagri.go.id/pages/profil-daerah/provinsi/detail/19/kepulauan-bangka-belitung.
.

Appendix 1

Fisher's Boat in Tanjung-Gunung Shoreline
(Field Research, Tanjung Gunung 2013)

FGD with Tanjung Gunung`s Local
(Field Research, Tanjung Gunung, 2013)

Group Interview with Tanjung Gunung Housewives
(Field Research, Tanjung Gunung, 2014)

Small-scale coastal tin mining pontoon operating in Tanjung Gunung Waters
(Field Research, Tanjung Gunung, 2014)

Tin Tailing extracted by the Scavenger
(Field Research, Tanjung Gunung, 2014)

Housewive Scavengers in Tanjung Gunung
(Field Research, Tanjung Gunung, 2013)

Housewives were drying the caught crabs
(Field Research, Tanjung Gunung, 2014)

Interview with Local Elders
(Field Research, Tanjung Gunung, 2013)

One of net fisher`s non-permanent house
(Field Research, Tanjung Gunung, 2014)

Interview with one of Net Fisher
(Field Research, Tanjung Gunung, 2014)

Fishing Net
(Field Research, Tanjung Gunung, 2014)

Fishing Trap or locally called as Bubu
(Field Research, Tanjung Gunung 2014)

Suction Dredger
(Field Research, Tanjung Gunung, 2014)

Local farmer`s wife during interview
(Field Research, Tanjung Gunung, 2014)

Local Fisher's Wife attending their Husband came back from work
(Field Research, Tanjung Gunung, 2014)

Local fishers' protest on suction dredger operation
(Field Research, Tanjung Gunung, 2014)

Group Discussion with miners' group
(Field Research, Tanjung Gunung, 2014)

Focus Group Discussion
(Field Research, Tanjung Gunung, 2014)

Shoreline of Selindung
(Field Research, Tanjung Gunung, 2015)

Group discussion with housewives
(Field Research, Selindung, 2015)

Pepper, one of the main agricultural commodity
(Field Research, Selindung, 2015)

Rubber, one of the main agricultural commodity
(Field Research, Selindung, 2015)

One of the local farmers is harvesting the palm fruits
(Field Research, Tanjung Gunung, 2014)

The destructed beach area caused by mining
(Field Research, Tanjung Gunung, 2014)

Small-scale land mining site in Selindung
(Field Research, Selindung, 2016)

Housewives working as scavanger in Riverside
(Field Research, Selindung, 2016)

The main access road to Selindung, constructed by the support of suction dredging company
(Field Research, Selindung, 2015)

The only elementary school available in Selindung. Its renovation was supported by Suction dredging company
(Field Research, Selindung, 2015)

Masjid constructed by the support of Suction Dredging Company
(Field Research, Selindung, 2015)

Hamlet Center, the venue of PCM
(Field Research, Selindung, 2016)

Rubber, one of the main agricultural commodity
(Field Research, Selindung, 2015)

Rubber, one of the main agricultural commodity
(Field Research, Selindung, 2015)

With local fishers after group interview
(Field Research, Selindung, 2015)

Some local miners who walked out during public meeting with suction dredger company
(Field Research, Selindung, 2016)

Home interview
(Field Research, Selindung, 2016)

Group interview with different subistence groups
(Field Research, Selindung, 2015)

Focus Group Discussion in Selindung
(Field Research, Selindung, 2016)

Focus Group Discussion in Selindung
(Field Research, Selindung, 2016)

Group Interview with fishers in Selindung
(Field Research, Selindung, 2016)

Group Interview with miners in Selindung
(Field Research, Selindung, 2016)

Appendix 2

HOUSEHOLD QUESTIONNAIRE

Respondent Name		**Enumerator Name**	
Survey Date		**Signature**	

SECTION A- A1. Demographic		
1	**Name**	
2.	**Sex (F/M)**	
3.	**Age (..years old)**	
4.	**Length of stay in Selindung Hamlet (...Years)**	
5.	**Origins**	
6	**Social Position/Social Responsibility in Community**	
7.	**Household`s Size**	a. 2 persons b. 3-5 persons c. 6-8 persons d.<8 persons

A2. Livelihood Trajectory				
No	**Period (Year…-Year….)**	**.Main Livelihood Activity**	**Supporting Livelihood Activity**	**Reason of Shifting**

A3. Household Livelihood Assets			
Type of Livelihood Resources	**Type of Livelihood Resource Capital**		**Total**
Natural Capital			
	Land type; Total Area	1. Pekarangan 2. Kebun 3. Forest/Original Land	.....m2/Ha/block .....m2/Ha/block m2/Ha/block
	Land Status	1. Self-own 2. Leased	……..m2/Ha/block m2/Ha/block
	Commodity	1. Pepper 2. Rubber 3. Palm oil 4. Mixed Crops	.....m2/Ha/block .....m2/Ha/block .....m2/Ha/block m2/Ha/block
	Area of land sold	……..m2/Ha/Block	
	Price of selling land	Rp/m2/Ha/block ……..……; Total: Rp…….	
	Buyer	a. X Hamlet Locals b. Y Village Locals c. People from outside d. Palm Oil Company	
	Reasons of selling the land	a. Urgent family/personal needs b. Needs of capital for fishing/agriculture c. Needs of capital for mining d. Savings e. Others, please mention…….	
	Any external influence of selling the land	a. Yes, a. family/relative pressure b. local govt pressure c. Company pressure b. No	
Financial Capital	***Saving (Bank dan Non-Bank)***	Rp.....	
	Pepper	.....kgs/ .....sacks	
Physical Capital	***Area of housing***	.....ha /.....m2	
	Status	a. Single Family b. Joint Family	
	Construction	a. Permanent b. Semi-permanent c. Permanent	

	Boat Ownership	1. Self-owned Boat, 2. Joint with another fisher (Group) 3. Joint with Boss (Profit Share)	
	Machine Capacity	……. ……..……PK	
	Fish Distribution	1. Direct sale to market, 2. Group sale organized by group leader 3. Sold by collector	
	Commodity	**<u>West/North Season</u>**	**<u>East/Southeast Season</u>**

	Fishing Instruments	**West/North Season** a. Pancing b. Rawai c. Bagan d. Bubu	**East/South east Season** a. Pancing,b. Rawai c. Bagan d. Bubu
	Number of Bagan	……. units	
	Bagan Size	……..... meter x …….……meter	
	Materials o fbagan	a……wood; b. bamboo; others…….	
	Distance of bagan from the coast line	……. meters from coastline	
	Depth of bagan from the coastline	…….....meters depth	
	Cost of Making Bagan	Rp…….	
	Vehicles	a. Car ……. units; b. Motorbike ……...……....units	

Social Capital	**Networks**	**Type of relationship with network**
	Village Officer	Attending marriage, religious and family function
	Local Figure	Receiving trainings and economic empowerment
	Mining Company	Receiving capitalsfor the purpose of economic activity
	Fish Collector	Getting Job Opportunity
	Family and relatives	Getting change to utilize the land
	Cooperative	Receiving loan, mortgage, isntallment etc
	NGOs	Receiving compensation (Cash/non cash)
	Neighbour	Business transaction
	Academics	Government Programs (Charity, empowerment, social fund), etc

A4. Household Income Structure
Please input the income data of each household members on each season

Status within Household	Name	Season	Type of Livelihood		Total Income					
			Main	Supporting	Rp/day	Hr/week	Rp/week	Week/Mo	Rp/Mo	Mo/Year

Total: …….

SECTION B- PERCEPTION OF LOCALS ON SUCTION DREDGER OPERATION

Reasons Behind Agreement/Rejection

Did you agree on Suction dredger operation?	a. yes b. no
If any suction dredger will operate again in this hamlet with bigger compensation, will you support it?	a. yes b. no
If any suction dredger which previously operated in neighbor village propose operating license, will you agree on it?	a. yes b.no

If yes, what was the reason behind your agreement in the beginning?

No	Reasons	Agreement reasons	Rank the choices
1	Compensation and Royalty		
2	Envy towards another village		
3	Following majority advice		
4	No other option		
5	Recommended by family members		
6	Following majority voices within circle group		
7	Moral burden with relatives		
8	Expectation on Job Opportunity		

If no, what was the reason?

No	Reasons	Agreement reasons	Rank the choices
1	Threat to environment		
2	Temporary benefits		
3	Compensation and royalty is less		
4	Community suffered		
5	Less benefit received		

Since when your perception shifted?	Year of ……..……Month of……..……..…Season……..……..…..
Did anyone influence the shifting of your perception?	a. Yes, please mention: a. family members, b. neighbor, c.

What was the reason behind your perception shift?

No	*Reasons*	*Agreement reasons*	*Rank the choices*
1	Threat to environment		
2	Temporary benefits		
3	Compensation and royalty is less		

4	Community suffered		
5	Less benefit received		

SECTION C- CHANGES PERCEIVED

Impacts of Suction Dredger Operation

How did you perceive the impacts of suction dredger operation before its operation?	a. Impacts < Benefits b. Impacts = Benefits c. Benefits < Impacts
Did you understand that it will be happened before you agreed on it?	a. Yes b. No
If yes, how did you get that information?	a. Public meeting b. Personal Communication with local Government c. Neighbor Village Community d. Committee e. Family Members f. Others,…….
How did you experience the impacts of suction dredger operation after its operation?	
Did you find any difficulty? Please explain!	

Below are the possibility of the Current/Short Term Changes caused by Suction Dredger Operations, please state and chose the importance level of each point!

Changes		**Not Important**	**Slightly Important**	**Important**	**Very Important**	**Extremely Important**
Ecological Changes						
1.	Fish Stock Depleted					
2.	High Turbidity					
3.	Polluted sea					
4.	Variety of Fish depleted					
5.	Fishing ground reduced – require longer distance					
Economic Changes						
1.	Decreasing Daily Income					
2.	Difficulty to Sell Fish					
3.	Difficult to buy Fish					
4.	Unstable Fish Price					
5.	Fishing cost increased					
Socio-Political						

1	Low political influence					
2.	Horizontal Conflict (between local and govt; between local and company); Vertical Conflict (between locals within selindung, outside selindung					
3.	Locals become money oriented					
4.	Social Jealousy					
5.	Waning culture and local value					
Do you think that long term changes might be happened in suction dredger operation is continued to be operated?			a. Yes b. No			
If no, what is the reason?			a. I have no idea b. I don`t feel any possible changes happened so far c. I don't care about any possible changes caused by suction dredger operation			
What kind of possible long term changes might be happened if suction dredger is continued to be						
Changes		**Not Important**	**Slightly Important**	**Important**	**Very Important**	**Extremely Important**
Bagan is not compatible anymore as fishing Instrument						
Huge Cost for fishing Activity						
Depletion number of Fishers (possible of distinction)						
Fish Disappeared as the ecosystem will be completely destructed						
Recreational Place (Beach) lost as the beach become full of mud and mining waste						
Extreme Increase on Fish Price along with the depletion number of fish and huge cost of fishing						
People do not socialize (individualistic)						
No respect for social values/Relationship (like money)						
More possible conflicts occur						
…….						

SECTION D – ADAPTATION STRATEGY		
D1- Intentions to adapt		
1	***Do you think all the changes occurred are strongly affecting your daily life?***	a. yes b. no
2	***If no, what is the reason?***	a. I don't feel any such changes
		b. I feel it but no significance towards my life

		c. I don`t care about it
		d. I have no idea about that
3	***If yes, do you consider those changes as threat?*** a. yes b. no	
	Please explain	

Below is the list of possible changes, please choose whether those point of changes are considered as threat or no

Ecological Changes			
1.	Fish Stock Depleted (Quantity)	***Threat***	***Not threat***
2.	High Turbidity		
3.	Polluted sea		
4.	Variety of Fish depleted		
5.	Fishing ground reduced – require longer distance		
Economic Changes			
1.	Decreasing Daily Income		
2.	Difficulty to Sell Fish		
3.	Difficult to buy Fish		
4.	Unstable Fish Price		
5.	Fishing cost increased		
Socio-Political			
1	Low political influence		
2.	Horizontal Conflict (between local and govt; between local and company); Vertical Conflict (between locals within selindung, outside selindung		
3.	Locals become money oriented		
4.	Social Jealousy		
5.	Waning culture and local value		

D2- Strategy and Output				
No	**Changes**	**Adaptation Strategy**	**Output**	**Risk**

Ecological Changes				
1	***Fish Stock Depleted***	No Adaptation		
		Diversify Fishing Instruments		
		Change the Machine Capacity		
		Build Bagan in Longer Distance		
		Change the Fish Commodity		
		Build Bagan in more Depth		
		Increase Working Hours		
		……		
2	***High Turbidity***	No Adaptation		
		Shift the Fishing Ground		
		Change the Fishing Instruments		
		…….		
3	***Polluted sea***	No Adaptation		
		Shift the Fishing Ground		
		Change the Fishing Instruments		
		…….		
4	***Variety of Fish depleted***	No Adaptation		
		Diversify Fishing Instruments		
		Change the Commodity		
		Increase Working Hours		
		More Labor Works		
		…….		
		……..		
5	***Fishing ground reduced – require longer distance***	No Adaptation		
		Build another bagan in longer distance		
		Share Bagan with other Fishers		
		Shift to Daily wage fishing labor		
		……		
		…….		
Economic Changes				
1	***Decreasing Daily Income***	No Adaptation		
		Find another alternative job		
		Start Agriculture Activity		
		Shift to land mining activity		
		Borrow money		

		…….		
		……		
2	***Difficulty to Sell Fish***	No Adaptation		
		Sell to whoever collector available to buy on the spot with price decided by collector		
		Give bigger share to the boat owner		
		Go to auction market		
		Partly consume the fish at home		
		Processing into secondary product		
		……..		
3	***Difficult to buy Fish***	No Adaptation		
		Stop consuming fish		
		Keep buying fish even the price increase		
		Find substitute food		
		……		
4	***Unstable Fish Price***	No Adaptation		
		Stop consuming fish		
		Keep buying fish even the price increase		
		Find substitute food		
		…….		
5	***Fishing cost increased***	No Adaptation		
		Borrow Money		
		Share with other fishers		
		Shift to Daily wage fisher		
		……..		
Socio-Political Changes				
1	***Low political influence***	No Adaptation		
		Adaptation Strategy:		
2	***Horizontal Conflict (between local and govt; between local and company); Vertical Conflict (between locals within selindung, outside***	No Adaptation		
		Adaptation Strategy:		

	selindung			
3	***Locals become money oriented***	No Adaptation		
		Adaptation Strategy:		
4	***Social Jealousy***	No Adaptation		
		Adaptation Strategy:		
5	***Waning culture and local value***	No Adaptation		
		Adaptation Strategy:		
		Adaptation Strategy:		

D3 –Constraints
What are the constraints you experienced

	Internal Constraint	**External Constraint**

~ TERIMA KASIH ~

- Re-clarify and Elaborate with additional questions on some unclear answer, new findings, etc
- For the new findings outside the options provided, note it on the separate pages

Appendix 3

KUISIONER	NO:

IDENTITAS PRIBADI	
Nama	
Umur	
Asal/Suku	
Durasi Tinggal di Ds. Selindung	

STRUKTUR RUMAH TANGGA

	Jumlah jiwa	Pendidikan (ES/JHS/SHS/UN)	Pekerjaan	Status Ekonomi dalam Rumah Tangga (IN/DEP)
Penduduk Usia 0-15 Tahun				
Penduduk Usia 16-64 Tahun				
Penduduk usia 64 tahun atas				

PEKERJAAN DALAM BEBERAPA PERIODE

Sebelum Tahun 1999	***Tahun 1999-2010***	***2011-2013***	***2013-sekarang***
a. Nalayan b. TI Darat c. TI Apung d. Buruh Tani e. Buruh Nelayan f. Petani g. Lain-lain	a. Nalayan b. TI Darat c. TI Apung d. Buruh Tani e. Buruh Nelayan f. Petani/Pemilik g. Lain-lain	a. Nalayan b. TI Darat c. TI Apung d. Buruh Tani e. Buruh Nelayan f. Petani/Pemilik g. Lain-lain	a. Nalayan b. TI Darat c. TI Apung d. Buruh Tani e. Buruh Nelayan f. Petani/Pemilik g. Lain-lain

PEKERJAAN PER MUSIM

	Utama	Pendukung
Musim Barat/Utara		
Musim Timur/Tenggara		

KEPEMILIKAN ASET

Lahan

Jenis Lahan	a. Pekarangan b. Kebun c. Hutan			
Status lahan	a. Tidak pernah difungsikan b. Sedang difungsikan c. Pernah difungsikan tapi sedang tidak difungsikan			
Jenis komoditas	a. Lada b. Karet c. Sawit d. Buah dan Sayur d. Campuran			
Instrumen/akses Perikanan				
Perahu	a. Milik Sendiri b. Join dengan nelayan lain c. Join dengan boss			
Alat Tangkap	<u>Musim Barat/Utara</u> 1. Pancing 2. Rawai 3. Bagan 4. Bubu 5. …….	<u>Musim Timur/Tenggara</u> 1. Pancing 2. Rawai 3. Bagan 4. Bubu 5. ……		
Distribusi Ikan	a. Jual langsung ke Pasar b. Melalui kelompok c. Dijual ke tengkulak			
Aset Tersier	a. Sepeda Motor ;…….. b. Mobil ;……..			
Bangunan Rumah	a. Bangunan Semi Permanen b. Rumah gubuk/kayu			
Dependency on Coastal Resources				
No	Statement	Agree	Neutral	Disagree
1.	Laut dan sumberdayanya sangat penting bagi kehidupan saya dan keluarga saya			
2.	Hampir setiap hari saya makan ikan atau hasil laut lain			
3.	Bagi saya laut adalah sumber kehidupan, tempat saya mencari nafkah			
4.	Jika harga ikan naik, saya akan mengurangi konsumsi ikan			
5.	Dibandingkan 20 tahun yang lalu, jumlah ikan yang saya konsumsi bertambah			
Dependency on Tin Mining				
1.	Saya pernah terlibat di aktivitas TI Apung			
2.	Saya pernah terlibat di aktivitas TI Darat			
3.	Bagi saya aktivitas TI Apung bersifat positif dari segi penghasilan			
4.	Saya setuju seandainya aktivitas TI Apung diadakan di sini			
5.	Seandainya TI Apung diadakan di kampung ini, masyarakatlah yang seharusnya mengkoordinasi			
6.	Bagi saya, dampak lingkungan dari tambang laut seperti keruhnya air laut, oil leak, sampah kayu dan besi di laut, tidak menjadi masalah bagi saya			
7.	Jika saya menangkap ikan di laut, menjaring atau memancing, saya tidak merasa terganggu oleh adanya tambang laut			
8.	Tanpa hasil tambang, saya tidak bisa mencukupi kebutuhan keluarga			
Perception on Suction Dredger				

1.	Saya tahu bahwa kapal hisap (selanjutnya disebut kapal hisap) pernah beroperasi di kampung selindung pada tahun 2010-2013			
2.	Saya menyetujui adanya operasi KH			
3.	Jika dimintai persetujuan oeprasi kapal hisap, saya akan memberikan tanda tangan saya untuk menyeteujui KH			
4.	Dengan adanya operasi KH, saya merasa senang karena saya memperoleh tambahan pendapatan dari fee KH			
5.	Saya merasa jumlah fee kapal hisap masih kurang dan harus ditambah			
6.	Dengan adanya operasi KH, saya merasa senang karena saya bisa punya peluang untuk ikut memikul timah			
7.	Upah mikul saya rasa belum seimbang dengan jumlah tenaga yang saya keluarkan			
8.	Bantuan dari perusahaan KH untuk pembangunan fasilitas public seperti masjid, jalan, dll saya rasa penting untuk memajukan kampung selindung			
9.	Saya berharap bahwa kedepannya aka nada perusahaan KH yang beroperasi di dusun selindung			
10.	Sebelum adanya operasi Kapal Hisap, saya tidak risau karena jalanan berdebu akibat lalu lalang kendaraan bermotor yang digunakan oleh masyarakat air belo yang pergi memikul			
11.	Sayab merasa terganggu dengan datangnya rombongan masy air belo yang memikul timah lewat dusun			
12.	Seharusnya upah mikul diberikan ke masy dusun selindung bukan desa air belo			
13.	Meskipun tetangga dan keluarga saya ada yang tidak menyetujui operasi KH, saya tetap setuju			
14.	Tanpa adanya pendapatan tambahan dari kapal hisap, saya tidak akan mampu mencukupi kebutuhan keluarga saya			
15.	Meskipun ada himbauan dari pemerintah local atau daerah untuk tidak memberikan izin kepada KH, saya akan tetap menyetujui.			
Pertanyaan untuk Nelayan				
1.	Sebelum operasi KH hasil tangkapan ikan lebih besar dibandingkan sebelum operasi KH			
2.	Sebelum operasi KH, jaring ikan saya cenderung jarang tersangkut ke bongkahan kayu di tengah lautan			
3.	Sebelum operasi KH, bagan saya cenderung jarang rusak, akibat tertumbur			
4.	Sebelum operasi KH, jam kerja saya di laut lebih pendek			
5.	Sebelum operasi KH, saya tidak perlu pergi melaut terlalu jauh karena ikan masih mudah ditemui di pinggir perariran			
6.	Setelah operasi KH, beberapa spesies ikan yang saya tangkap tidak dapat saya temui lagi			
7.	Setelah operasi KH jumlah penghasilan harian saya cenderung menurun			
8.	Sebelum operasi KH, saya tidak pernah menjumpai air laut yang mengeruh akibat limbah KH			
9.	Sebelum operasi KH, saya tidak menjumpai air laut yang tercemar oleh minyak/bahan bakar			

10.	Sebelum oeprasi KH, saya lebih mudah mencari ikan dibandingkan setelahnya			
Participation in Public Meeting				
1	Apakah anda pernah menghadiri public consultancy/pertemuan warga untuk membahas perijinan KH?	a. Ya,…. b. Tidak, mengapa		
2.	Bagaimana anda memperoleh undangan acara tersebut?	a. Undangan tertulis b. Melalui telepon c. Secara lisan		
3.	Siapa yang memberi kabar mengenai acara tersebut?	a. Kadus b. Tetangga c. Lain lain….		
4.	Apakah anda tau tujuan dari acara tersebut?	a. Ya b. Tidak Tolong disebutkan …… ……		
5.	Apakah anda datang sendiri ke acara pertemuan tersebut	a. Ya b. Tidak, dengan siapa……		
6.	Adakah orang lain yang mempengaruhi anda untuk dating ke acara public meeting tersebut	a. Ya b. Tidak		
7. .	Apakah menghadiri pertemuan tersebut anda rasa penting	a. Ya, tolong jelaskan alasannya …… …….. b. Tidak, mengapa …… …….. ……..		
8.	Seingat anda, berapa orang yang dating ke acara pertemuan tersebut?			
9.	`Apakah anda memiliki kesempatan untuk berpendapat?			
10.	Apakah anda berani berpendapat saat itU? Jika ya, ide apa yang anda sampaikan saat itu			
11.	Apakah anda memberikan dukungan terhadap kapal hisap saat pertemuan tersebut?			
Participation on Committee members				
1.	Apakah anda pernah terlibat menjadi panitia KH	a. Ya, berapa kali b. Tidak		
2.	Jika tidak, mengapa,`	a. Saya tidak pernah mendapat kesempatan b. Saya memiliki kesempatan tersebut tapi saya tidak tertarik c. Saya memiliki kesemoatan tersebut tapi saya merasa tidak kompeten		
3.	Apa alasan anda memutuskan untuk terlibat sebagai panitia?			

4	Apa tugas anda sebagai bagian dari panitia saat itu? Dan jelaskan	
5..	Apakah anda berpartisipasi dalam poertemuan panitia? Dan dalam pertemuan tersebut apakah anda punya kesempatan untuk berpendapat?	
Participation in Tin Loading Activity		
1.	Apakah anda pernah terlibat menjadi tenaga pemikul timah?	a. Ya b. Tidak
2.	Berapa kali anda terlibat sebagai pemikul timah?	
3.	Darimana ada memperoleh informasi mengenai kegiatan ini?	a. Kadus b. Tetangga c. Panitia d. Lainnya…….
4.	Menurut anda apakah upah pikul setara dengan tenaga yang saya keluarkan ketika bekerja	a. Ya b. Tidak
5.	Apakah kegiatan memikul timah ini lebih menjanjikan dibandingkan kegiatan pertanian, perikanan, dll?	a. Ya b. Tidak
6.	Apakah kegiatan memikul timah ini lebih mudah dibandingkan kegiatan pertanian, perikanan, dll?	a. Ya b. Tidak
7.	Apakah anda berharap kegiatan memikul ini akan terus ada?	a. Ya b. Tidak
8.	Apakah anda puas dengan kinerja panitia yang mengkoordinir kegiatan ini?	a. Ya b. Tidak, jelaskan…… …… ……
Compensation		
1.	Apakah anda pernah menerima fee KH?	a. Ya b. Tidak
2.	Berapa kali? Dan berapa rata rata jumlahnya	
3.	Apakah anda mengambil sendiri atau diambilkan?	
4.	Apakah jumlah fee yang anda terima dirasa cukup?	a. Ya b. Tidak
5.	Apakah fee tersebut sangat bermanfaat untuk keluarga anda? Digunakan untuk apa saja uangnya	a. Ya b. Tidak Digunakan untuk; a. menabung; b. belanja sehari-hari;

		c. membeli kebutuhan tersier seperti barang elektronik atau cicilan motor d. lainnya…….
6	Apakah anda puas dengan peran pemerintah local dalam membantu distribusi fee dan menjembatani kepentingan masyarakat dengan perusahaan	a. Ya b. Tidak Jelaskan…… …… ……
7.	Apakah anda puas dengan kinerja panitia dalam hal distribusi fee KH?	a. Ya b. Tidak Jelaskan…… …… …… ……..
8.	Apakah anda memiliki ekspektasi khusus kepada pemerintah atau perusahaan jika kedepannya akan mengajukan permohonan operasi di dusun selindung?	

Terima Kasih

Appendix 4

QUESTIONNAIRE – ADAPTATION STRATEGY

Respondent Name		**Enumerator Name**	
Survey Date		**Signature**	

SECTION A- A1. Demographic		
1	**Name**	
2.	**Sex (F/M)**	
3.	**Age (..years old)**	
4.	**Length of stay in Selindung Hamlet (...Years)**	
5.	**Origins**	
6	**Social Position/Social Responsibility in Community**	
7.	**Household`s Size**	a. 2 persons b. 3-5 persons c. 6-8 persons d.<8 persons

A2. Livelihood Trajectory				
No	**Period (Year…-Year….)**	**. Main Livelihood Activity**	**Supporting Livelihood Activity**	**Reason of Shifting**

A3. Household Livelihood Assets			
Type of Livelihood Resources	**Type of Livelihood Resource Capital**		**Total**
Natural Capital			
	Land type; Total Area	1. Pekarangan 2. Kebun 3. Forest/Original Land	.....m2/Ha/block .....m2/Ha/block m2/Ha/block
	Land Status	1. Self-own 2. Leased	……..m2/Ha/block m2/Ha/block
	Commodity	1. Pepper 2. Rubber 3. Palm oil 4. Mixed Crops	.....m2/Ha/block .....m2/Ha/block .....m2/Ha/block m2/Ha/block
	Area of land sold	……..m2/Ha/Block	
	Price of selling land	Rp/m2/Ha/block ……...……; Total: Rp…….	
	Buyer	a. X Hamlet Locals b. Y Village Locals c. People from outside d. Palm Oil Company	
	Reasons of selling the land	a. Urgent family/personal needs b. Needs of capital for fishing/agriculture c. Needs of capital for mining d. Savings e. Others, please mention…….	
	Any external influence of selling the land	a. Yes, a. family/relative pressure b. local govt pressure c. Company pressure b. No	
Financial Capital	***Saving (Bank dan Non-Bank)***	Rp.....	
	Pepper	.....kgs/ .....sacks	
Physical Capital	***Area of housing***	.....ha /.....m2	
	Status	a. Single Family b. Joint Family	
	Construction	a. Permanent b. Semi-permanent c. Permanent	

	Boat Ownership	1. Self-owned Boat, 2. Joint with another fisher (Group) 3. Joint with Boss (Profit Share)	
	Machine Capacity	……. ……..……PK	
	Fish Distribution	1. Direct sale to market, 2. Group sale organized by group leader 3. Sold by collector	
	Commodity	**West/North Season**	**East/Southeast Season**
	Fishing Instruments	**West/North Season** a. Pancing b. Rawai c. Bagan d. Bubu	**East/South east Season** a. Pancing, b. Rawai c. Bagan d. Bubu
	Number of Bagan	……units	
	Bagan Size	……..... meter x …….……meter	
	Materials o fbagan	a……wood; b. bamboo; others…….	
	Distance of bagan from the coast line	……meters from coastline	
	Depth of bagan from the coastline	…….....meters depth	
	Cost of Making Bagan	Rp……	
	Vehicles	a. Car ……. units ; b. Motorbike ……...……....units	

Social Capital	**Networks**	**Type of relationship with network**
	Village Officer	Attending marriage, religious and family function
	Local Figure	Receiving trainings and economic empowerment
	Mining Company	Receiving capitalsfor the purpose of economic activity
	Fish Collector	Getting Job Opportunity
	Family and relatives	Getting change to utilize the land
	Cooperative	Receiving loan, mortgage, isntallment etc
	NGOs	Receiving compensation (Cash/non cash)
	Neighbour	Business transaction
	Academics	Government Programs (Charity, empowerment, social fund), etc

A4. Household Income Structure
Please input the income data of each household members on each season

Status within Household	Name	Season	Type of Livelihood	Total Income

			Main	Supporting	Rp/day	Hr/week	Rp/week	Week/Mo	Rp/Mo	Mo/Year

Total: …….

SECTION B- PERCEPTION OF LOCALS ON SUCTION DREDGER OPERATION

Reasons Behind Agreement/Rejection

Did you agree on Suction dredger operation?	a. yes b. no
If any suction dredger will operate again in this hamlet with bigger compensation, will you support it?	a. yes b. no
If any suction dredger which previously operated in neighbor village propose operating license, will you agree on it?	a. yes b.no

If yes, What was the reason behind your agreement in the beginning?

No	Reasons	Agreement reasons	Rank the choices
1	Compensation and Royalty		
2	Envy towards another village		
3	Following majority advice		
4	No other option		
5	Recommended by family members		
6	Following majority voices within circle group		
7	Moral burden with relatives		
8	Expectation on Job Opportunity		

If no, what was the reason?

No	Reasons	Agreement reasons	Rank the choices
1	Threat to environment		
2	Temporary benefits		
3	Compensation and royalty is less		
4	Community suffered		
5	Less benefit received		

	Since when your perception shifted?	Year of ……..……Month of……..……..…Season……..……..…..
	Did anyone influence the shifting of your perception?	a. Yes, please mention: a. family members, b. neighbor, c.

What was the reason behind your perception shift?

No	*Reasons*	*Agreement reasons*	*Rank the choices*
1	Threat to environment		
2	Temporary benefits		
3	Compensation and royalty is less		
4	Community suffered		
5	Less benefit received		

SECTION C- CHANGES PERCEIVED

Impacts of Suction Dredger Operation

How did you perceive the impacts of suction dredger operation before its operation?	a. Impacts < Benefits b. Impacts = Benefits c. Benefits < Impacts
Did you understand that it will be happened before you agreed on it?	a. Yes b. No
If yes, how did you get that information?	a. Public meeting b. Personal Communication with local Government c. Neighbor Village Community d. Committee e. Family Members f. Others,…….
How did you experience the impacts of suction dredger operation after its operation?	
Did you find any difficulty? Please explain!	

Below are the possibility of the Current/Short Term Changes caused by Suction Dredger Operations, please state and chose the importance level of each point!

	Changes	**Not Important**	**Slightly Important**	**Important**	**Very Important**	**Extremely Important**
	Ecological Changes					
1.	Fish Stock Depleted					
2.	High Turbidity					
3.	Polluted sea					

	4.	Variety of Fish depleted					
	5.	Fishing ground reduced – require longer distance					
	Economic Changes						
	1.	Decreasing Daily Income					
	2.	Difficulty to Sell Fish					
	3.	Difficult to buy Fish					
	4.	Unstable Fish Price					
	5.	Fishing cost increased					
	Socio-Political						
	1	Low political influence					
	2.	Horizontal Conflict (between local and govt; between local and company); Vertical Conflict (between locals within selindung, outside selindung					
	3.	Locals become money oriented					
	4.	Social Jealousy					
	5.	Waning culture and local value					
	Do you think that long term changes might be happened in suction dredger operation is continued to be operated?			a. Yes b. No			
	If no, what is the reason?			a. I have no idea b. I don`t feel any possible changes happened so far c. I don't care about any possible changes caused by suction dredger operation			
	What kind of possible long-term changes might be happened if suction dredger is continued to be						
	Changes		**Not Important**	**Slightly Important**	**Important**	**Very Important**	**Extremely Important**
	Bagan is not compatible anymore as fishing Instrument						
	Huge Cost for fishing Activity						
	Depletion number of Fishers (possible of distinction)						
	Fish Disappeared as the ecosystem will be completely destructed						
	Recreational Place (Beach) lost as the beach become full of mud and mining waste						

	Extreme Increase on Fish Price along with the depletion number of fish and huge cost of fishing					
	People do not socialize (individualistic)					
	No respect for social values/Relationship (like money)					
	More possible conflicts occur					
	……..					

SECTION D – ADAPTATION STRATEGY		
D1- Intentions to adapt		
1	***Do you think all the changes occurred are strongly affecting your daily life?***	a. yes b. no
2	***If no, what is the reason?***	a. I don't feel any such changes
		b. I feel it but no significance towards my life
		c. I don`t care about it
		d. I have no idea about that
3	***If yes, do you consider those changes as threat?*** a. yes b. no	
	Please explain:	

Below are the list of possible changes, please choose whether those point of changes are considered as threat or no

Ecological Changes			
1.	Fish Stock Depleted (Quantity)	***Threat***	***Not threat***
2.	High Turbidity		
3.	Polluted sea		
4.	Variety of Fish depleted		
5.	Fishing ground reduced – require longer distance		
Economic Changes			
1.	Decreasing Daily Income		
2.	Difficulty to Sell Fish		
3.	Difficult to buy Fish		
4.	Unstable Fish Price		
5.	Fishing cost increased		
Socio-Political			
1	Low political influence		
2.	Horizontal Conflict (between local and govt; between local and company); Vertical Conflict (between locals within selindung, outside selindung		
3.	Locals become money oriented		
4.	Social Jealousy		
5.	Waning culture and local value		

D2- Strategy and Output

No	Changes	Adaptation Strategy	Output	Risk
Ecological Changes				
1	***Fish Stock Depleted***	No Adaptation		
		Diversify Fishing Instruments		
		Change the Machine Capacity		
		Build Bagan in Longer Distance		
		Change the Fish Commodity		
		Build Bagan in more Depth		
		Increase Working Hours		
		……		
2	***High Turbidity***	No Adaptation		
		Shift the Fishing Ground		

		Change the Fishing Instruments		
		…….		
3	***Polluted sea***	No Adaptation		
		Shift the Fishing Ground		
		Change the Fishing Instruments		
		…….		
4	***Variety of Fish depleted***	No Adaptation		
		Diversify Fishing Instruments		
		Change the Commodity		
		Increase Working Hours		
		More Labor Works		
		…….		
		…….		
5	***Fishing ground reduced – require longer distance***	No Adaptation		
		Build another bagan in longer distance		
		Share Bagan with other Fishers		
		Shift to Daily wage fishing labor		
		……		
		……..		
Economic Changes				
1	***Decreasing Daily Income***	No Adaptation		
		Find another alternative job		
		Start Agriculture Activity		
		Shift to land mining activity		
		Borrow money		
		…….		
		…….		
2	***Difficulty to Sell Fish***	No Adaptation		
		Sell to whoever collector available to buy on the spot with price decided by collector		
		Give bigger share to the boat owner		
		Go to auction market		
		Partly consume the fish at home		
		Processing into secondary product		
		…….		

		.		
3	***Difficult to buy Fish***	No Adaptation		
		Stop consuming fish		
		Keep buying fish even the price increase		
		Find substitute food		
		……		
4	***Unstable Fish Price***	No Adaptation		
		Stop consuming fish		
		Keep buying fish even the price increase		
		Find substitute food		
		…….		
5	***Fishing cost increased***	No Adaptation		
		Borrow Money		
		Share with other fishers		
		Shift to Daily wage fisher		
		…….		
Socio-Political Changes				
1	***Low political influence***	No Adaptation		
		Adaptation Strategy:		
2	***Horizontal Conflict (between local and govt; between local and company); Vertical Conflict (between locals within selindung, outside selindung***	No Adaptation		
		Adaptation Strategy:		
3	***Locals become money oriented***	No Adaptation		
		Adaptation Strategy:		
4	***Social Jealousy***	No Adaptation		
		Adaptation Strategy:		

5	***Waning culture and local value***	No Adaptation		
		Adaptation Strategy:		
		Adaptation Strategy:		

D3 –Constraints
What are the constraints you experienced

	Internal Constraint	**External Constraint**

~ TERIMA KASIH ~

- Re-clarify and Elaborate with additional questions on some unclear answer, new findings, etc
- For the new findings outside the options provided, note it on the separate pages