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DEVELOPING CITY LEVEL SUSTAINABILITY INDICATORS  
IN THE MENA REGION WITH THE CASES OF BENGHAZI  
AND AMMAN.

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## **Abstract**

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Developing city-level sustainability indicators in the MENA region with the cases of Benghazi and Amman.

Key words: Sustainable cities, indicators, multi-dimensional, stakeholder-based, city-level, Benghazi, Amman, MENA

The development of a methodological framework for local and institutional sustainability assessment can be helpful for planners and urban governments. The aim of this research is to develop an approach to local and institutional sustainability assessment (ALISA). It is designed to assist in the clarification, formulation, preparation, selection, and ranking of key indicators to facilitate the assessment of city sustainability at the local and institutional level in the Middle Eastern and North African (MENA) cities.

The ALISA methodological framework is developed using joint documentary and analysed data in the two case studies of Benghazi and Amman. The data for this also includes focus-group discussions, semi-structured interviews, and questionnaires that reflect the approach required in order to develop a combined framework that assists the development of sustainability indicators.

The initial list of proposed sustainability indicators for Benghazi contains 37 indicators. This list was developed based on logical information and procedure which has been supported by consultants and specialists in sustainability and urbanization from the University of Benghazi in the form of workshops as well as searching through the literature on sustainable development. Similarly, with support from consultants and specialists in sustainability and urbanization from the Applied science University a list of 36 indicators was also developed in Amman.

Both lists were given to the local communities in Benghazi and Amman to be ranked based on priority to identify two final lists of sustainability indicators. The results indicated that economic and social indicators were highly ranked in Benghazi and Amman, respectively.

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## GLOSSARY

Academics (A)

Approach to Local and Institutional Sustainability Assessment (ALISA)

Assaraya Trading and Investment Bank (ATIB)

Bureau of Local Government Development (BLGD)

Business and Human rights Resource Centre (BHRRC)

Census and Economic Information Centre (CEIC).

Commission on Sustainable Development (CSD)

Consultants (C)

Department of Economic and Social Affairs (DESA)

Department of the Interior and Local Government (DILG)

Engineers (E)

European Commission (EC)

European Union (EU)

Extended Urban Metabolism Model (EUMM)

Focus Group on Smart Sustainable Cities (FGSSC)

Food and Agriculture Organization of the United Nations (FAOUN)

Governmental (G)

Greater Amman Comprehensive Development Plan (GACDP)

Greater Amman Municipality (GAM)

Gross Domestic Product (GDP)

Group discussions (GD)

Gulf Cooperation Council (GCC)

High Density Mixed-Use (HDMU)

Information and Communication Technologies (ICTs)

Innovative Governance of Large Urban Systems (IGLUS)

International organisations (IO)

Inverse Problem Method (IPM)

Jordan Engineers Association of Amman (JEA)

Leadership in Energy and Environmental Design (LEED)

Libyan General Authority for Telecommunications and Informatics (GATI)

London Sustainable Development Commission (LSDC)

Middle East and North Africa (MENA)  
Middle East Monitor (MEM)  
Non-governmental Organizations (NGOs)  
Private Hospitals Association (PHA)  
Small and Medium Enterprise (SME)  
Smart Sustainable City (SSC)  
Solid Waste Management (SWM)  
State of the Environment (SOE)  
Strengths, Weaknesses, Opportunities, and Threats (SWOT)  
Sustainability Indicators (SI)  
Sustainable Cities (SC)  
Sustainable Development (SD)  
Sustainable Development Goal 11 (SDG 11)  
Sustainable Development Indicator (SDI)  
The Central Bank of Libya (CBL)  
The City Resilience Framework (CRF)  
The Foreign & Commonwealth Office (FCO)  
The Friedrich Ebert Foundation (FES)  
The International Committee of the Red Cross (ICRC)  
The International Labour Organization (ILO)  
The Libyan National Centre for Disease Control (NCDC)  
The Natural Step (TNS)  
The Organization of the Petroleum Exporting Countries (OPEC)  
The United Kingdom's Local Government Management Board (LGMB)  
The United Nations Educational, Scientific and Cultural Organization (UNESCO)  
The United Nations High Commissioner for Refugees (UNHCR)  
The United Nations Relief and Works Agency (UNRWA)  
The United States Trade and Development Agency (USTDA)  
The World War One (WW1)  
United Nation Environment Program (UNEP)  
United Nations (UN)  
United Nations Commission on sustainability development (UNCSD)  
United Nations Development Programme (UNDP)

United Nations Framework Convention on Climate Change (UNFCCC)

United Nations Human Settlement Programme (UN-Habitat)

United Nations Support Mission in Libya (UNSMIL)

Who, How, What framework (WHW)

World Commission on Environment and Development (WCED)

World Economic Forum (WEF)

World Food Programme (WFP)

## CHAPTER 1

### INTRODUCTION

#### 1.1 INTRODUCTION OF THE RESEARCH.

What we consume every day, how we move and how we manage our waste and our daily needs, are all critical factors in influencing our decisions on everyday life use of resources that we have on Earth. We have become a world of urban areas with the majority of population living in urban areas-in some countries this is above 80% but, in many Sub-Saharan African countries this below 40%.

According to Vaidya and Chatterji (2020) the recognition of the importance of the cities in the modern world led the United Nations General Assembly (UNGA) in 2015 to decide and adopt 'sustainable cities and communities as a distinct goal (SDG 11) under the Agenda for Sustainable Development (2030)\_(Vaidya and Chatterji, 2020).

Under the assistance of the United Nations agreements, such as the Paris Agreement the United Nations Framework Convention on Climate Change (UNFCCC) and the New Urban Agenda of UN-Habitat the recent global policy dialogues have put pressure upon the need for concentrating at the city and the community scale – not only to achieve long-term developmental goals, but also to make direct tangible benefits to the quality of lives of the people and local communities. This was the main aim of the development of the SDG 11 (Vaidya and Chatterji, 2020). In the same manner, Jane Jacobs (1992) argues that local communities and inclusion of everyone in the city is what make cities better. She quotes:



“Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody” (Jane Jacobs, 1992 p 238).

The fact that most cities' inhabitants have an ecological footprint much higher than earth can sustain, is an alerting issue that is challenging the world to ensure that people can be provided with enough resource to maintain. The (UN-Habitat 2011) argues that, in order to move the world towards more sustainability, it is essential to start such a process with cities in the first instance. This is due to the fact that cities are responsible for the majority of the greenhouse gas emission that led to air pollution, and waste distribution which is considered as the main reason behind climate change that is taking place on Earth (UN-Habitat 2011). According to the United Nations (2020), cities consume 78 per cent of the world's energy and produce more than 60 per cent of greenhouse gas emissions (The United Nations, 2020),

The concept of sustainable development is based on the idea that human societies must live and meet their current needs without compromising the ability of future generations to meet their own needs (United Nations 1987). According to Youmatter (2020) (consultancy agency regarding sustainability development) the concept of sustainability arose at the beginning of the industrial revolution. Starting from the second half of the 19th century, the Western ss started to realize that their economic activities had an impact on their environment and social balance (Youmatter, 2020). According to Redclift (2005), the expression 'sustainable development' was first brought into use in policy circles after the publication of the Brundtland Commission's report on the global environment and development in 1987. This report led directly to the term 'sustainable development' which refers to policy discourse. In addition, the term was also the first overview of the globe, which considered the environmental aspects of development from an economic, social, and political perspective (Redclift, 2005 p 212).

A number of the ecological and social crises which took place in the last 100 years, has led to an increase of the awareness of the need for a sustainable development agenda that could give the world pathways to improve the environmental, social and economic issues worldwide. For example, the 1907 American banking crisis, the 1929 financial crisis, the 1968 worldwide protests against bureaucratic elites, the 1973 and the 1979 oil shocks, the 1982 debt shock of developing countries, and most recently the issue of global warming (Youmatter, 2020).

According to the United Nations (1997) the 1992 United Nations international summit named Earth Summit Agenda 21, was held in Rio de Janeiro, Brazil, and involved 178 governments. Agenda 21 addresses the challenges of today and also aims to prepare the world for the challenges of the future. It reflects a global consensus and political commitment at the highest level on development and environmental cooperation. The major objective of the Agenda 21 initiative is that every local government should draw its own local Agenda 21 based on the local challenges (United Nations, 1997 p 3).

According to the United Nations (1997), sustainable development must be achieved at every level of society. For example, local organizations, women's groups, and non-governmental organizations. The local levels of societies are important sources of innovations and actions to have the ability to promote sustainable development (United Nations, 1997 p 15). Local communities' approach to assets sustainability, should be supported by governments in cooperation with the international and local governmental organizations (United Nations, 1997).

Shattuck (2015), argues that in order to achieve sustainable development, the process must include all different stakeholders and the goals and targets must be agreed upon. To monitor the progress on different dimensions we need indicators. Therefore developing appropriate indicators must be part of the process. (Shattuck 2015). In order to develop sustainability indicators,

frameworks must be developed too. Frameworks are the logical structures to develop indicators (Nathan and Reddy 2008).

Hilmi et al (2015) argues that, in the Middle East and North Africa (MENA) region, the lack of data availability and the existence of numerous measures of sustainable development makes it difficult to select appropriate indicators for sustainability development (Hilmi et al. 2015). For example, in the case of Libya which is a very similar case to many countries in the MENA region, weaknesses are still found in the field of sustainable development. This is due to the absence of comprehensive frameworks that lead to a lack of sustainable development indicators (Elgadi et al. 2016).

According to the United Nations Commission on sustainability development (UNCSD 2001), one of the best-known examples of framework is known as the theme-based framework. The UNCSD theme-based framework has a hierarchical structure built on four dimensions of sustainable development (social, environmental, economic, and institutional) (Wu and Wu 2012).

In this research, the methodological framework of sustainability indicators at the institutional and local levels is based on a combination between the (UNCSD 2001) theme-based framework and the issue-based Framework illustrated by Maclaren (1996). This combined framework will be applied in 2 cities located in the MENA region (Benghazi and Amman) to contribute to the progress of developing a set of sustainability indicators at two levels of the cities.

This chapter illustrates an introduction of a conceptual framework which will be implemented in 2 cities in the MENA region to develop a set of sustainability indicators at the institutional and local levels. In addition, this chapter illustrates the context of the research, the importance of the study, the research questions, the goals and objectives of this research, an outline of the methodology, and the thesis structure.

## 1.2 THE CONTEXT OF THE RESEARCH:

The Earth Summit of Rio de Janeiro 1992, illustrated the important role of indicators in order to help countries to create informed decisions regarding sustainable development (Dept. of and Social Affairs 2001). In order to achieve sustainable development, a number of challenges must be considered such as healthcare, education quality, poverty rate, and other challenges illustrated within the forty chapters of Agenda 21.

On the other hand, Weiss (1992) the main goal of the Earth Summit is to basically focus on the importance of addressing communities, challenges at the local level of cities (Weiss 1992). This recognition is articulated in Chapter 40 of Agenda 21 which emphasize that countries must develop their indicators at the national level, as well as governmental and non-governmental organizations level in order to develop and identify indicators of sustainable development that can deliver a solid basis for decision- making at all levels (Dept. of and Social Affairs 2001).

To achieve the process of developing sustainability indicators, frameworks are needed. Using frameworks can help to identify indicators to identify gaps in available data, indicator sets and general understanding of the human-environmental system of concern (Wu and Wu 2012).

This research concerned with the development of sustainability indicators at the level of local institutions and local communities. Consequently, the development of an approach to local and institutional sustainability assessment (ALISA) is a conceptual framework that will be developed in this thesis to help developing sustainability indicators in two cities in the MENA region. Furthermore, these two cities are facing a number of challenges with regard to sustainability development. The framework will be tested in two cities with unique conditions in the MENA region. One city is classified as a post-conflict place (Benghazi) and the second city is the city of Amman. This city is also struggling with the issue of refugees from the Syrian conflict. Testing the ALISA framework in such situations will contribute to its originality. As well as explaining the need for sustainable

development in the MENA cities, the next section will illustrate the importance of the study and why developing such indicators can be usefully employed for the sustainability development process.

### **1.3 THE IMPORTANCE OF THE STUDY:**

During 2011, a major uprising took place in the MENA region, a number of challenges were the driver of the large demonstrations that took place in a number of countries in the MENA. Since the 1950s, many of the Arab nations were as prosperous as South Korea, Malaysia, and several Latin American countries. Five decades later, the situation remains underdeveloped. The main cause of this failure is failing policies including poor decisions that were made by key stakeholders in these countries. Furthermore, the Arab nations were closed societies from the wider world which led to a lack of awareness of what was happening around them and what was happening to them (Sakbani 2011).

According to, Campante (2012), the long-term conditions that set the stage for the Arab Spring are clearly manifold. For example, the vulnerability of Arab regimes lists many possible determinants of instability. The number of long years in power of the political leaders; the size of the youth population cohort; lack of democracy, spreading of corruption, lack of press freedom, and GDP per capita (Campante, 2012 p 167). According to the United Nations Development Programme (UNDP) (2016) the notable exception is the uprising in Tunisia where the early hopes epitomized by the term 'Arab Spring' failed to materialise. The clientelism and corruption are still hampering structural improvements in economies, long-distance administrative management form citizen concerns and feed undemocratic states and the continuity of ruling elites (United Nations Development Programme, 2016 p 162).

On the other hand, Farooq et al (2017), the root of the demonstration of 2011 (Arab Spring) is based on a number of factors. For example, dictatorship, total monarchy, human rights violations, corruption, unemployment, high rate of

inflation and economic decline which all contributed to the dissatisfaction of the young population within the Arab World (Farooq et al. 2017).

Moreover, Agenda 21 of the Earth Summit of Rio de Janeiro, propose the sustainability indicators as a tool to assist decision-makers to measure cities performance and level of development (Weiss 1992). This then clarifies that in order to measure performance and to classify the priorities of challenges in cities, a process of creating a list of indicators is essential. However, the issue in the MENA cities is the difficulty of developing these indicators particularly based on the local level of communities. The lack of data for indicators in the MENA region makes it very difficult to apply any decisions that would assist and lead to the sustainability development process (Hilmi et al. 2015).

Chapter 40 of Agenda 21 of the Earth Summit identifies that information for decision making should be based on building bridges for data gaps, particularly in the developing nations. While considering that some data already exists, more data needs to be generated at the national level (Weiss 1992 p 346). There is a general lack of capacity particularly in the developing nations to collect and assess data in order to develop indicators for sustainable development. Indicators for sustainable developments must be developed to enable decision making to have a solid ground at all levels and to contribute to the sustainability development system (Weiss 1992 p 346).

Therefore, countries at the national, governmental and non-governmental levels must develop a concept of indicators of sustainable development in order to promote sustainable development (Weiss 1992 p 347).

Bearing this in mind this study will strive to apply this concept in two examples of the MENA countries, where it will try to develop a methodological framework that would assist to identify the most recent challenges in these cities and reform these challenges to become sustainability indicators. These indicators can build up the bridge to reach effective decisions and policies by key stakeholders.

#### **1.4 THE RATIONALE OF THE CHOICE OF THE MENA REGION:**

According to Kiprop V (2019), the region of the Middle East and North Africa (MENA) contains 19 nations, and contains almost 6% of the world's population. Starting from Morocco in the northwest of Africa to Iran in southwest Asia and down to Sudan in the east of Africa. The MENA region nations includes Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates, Palestine, and Yemen. Almost 60% of the world's oil reserves and 45% of the world's natural gas reserves are in the MENA region. Due to the region's high volume of petroleum and natural gas reserves, MENA is an essential source of the world's economic stability (Kiprop V, 2019).

Historically, according to Hamdan (1962), during the time of what is called the European Dark Ages following the collapse of the Roman Empire, the Arabs were busy building and developing new towns and renewing the old Roman towns of some places such as Egypt and Sassanian of Persia after the Arabs seized control in the region. This was the time when the Middle East led the world in many aspects and particularly in urban culture and urban life (Hamdan 1962 p 121). Costello (1977) argues that, the Middle East can be classified as the world's longest history of continuous urban development. However, all the historical factors which influenced the region previously is no longer influencing as much as the Arab conquest which is still noticeable on modern days (Costello 1977: 8).

According to the Arcadis (2016), sustainable cities index in the Middle East, eight cities from the Middle East region took place in the index with different ranks in the three pillars of sustainability. The list included Dubai, Abu Dhabi, Kuwait City, Doha, Muscat, Riyadh, and Jeddah. Moreover, some of those cities have significant results, especially within the sub-index. But on the other hand, some of the cities are performing particularly well in some factors but weaker in others (Arcadis 2016).

For instance, the city of Muscat ranks at a low level with 85th on the profit index, but the city takes the lead of the region on the people index with 9th overall. Furthermore, the city of Dubai is the region's top city on the overall index and one of the world's top leaders on the profit index with a rank of 4th on the list. But on the other hand, Dubai arrived at a low level on the planet index with number 96th globally (Arcadis 2016).

The MENA region and particularly the Arab nations still facing a number of challenges in terms of sustainable development. According to UN-Habitat, (2012) report on the state of Arab cities, the Arab nations are still facing a number of challenges including, lack of housing finance mechanisms, except at the highest, disenchantment and poverty induced by a lack of mobility which has been one of the fuelling mechanisms for the recent political polarization of the region (UN-Habitat, 2012).

According to the UN-Habitat (2012) report on the state of the Arab cities, Syria has, about 38% of the total population lives in informal settlements and, in Damascus, informal settlements are growing at 40 to 50 % per year. A large number of Syrian refugees escaped the armed conflict in Syria and settled in neighbouring countries like Jordan which increased economic, social, and environmental challenges in Jordan. On the other hand, Jordan, has about 16 % of the urban residents living in informal settlements. In Egypt, it is estimated that in the Greater Cairo Region 62 % of households live in informal settlements (UN-Habitat, 2012).

in addition, the Arab region is one of the least integrated with regards to internal trade, due to a lack of economic complementarity between countries and uncoordinated physical and policy infrastructures the unfair and uncompetitive business environment with the lack of transparency, corruption, the high cost of credit, and the difficulty in acquiring a securely titled lead to preventing greater economic development in the region (UN-Habitat, 2012).

In addition, the lack of modern facilities in the region increased traffic congestion and the number of the population in its traditional quarters. A lack of



economic development led to civil unrest in the region. Furthermore, migrant workers returning from war zones and unstable areas in places like Libya has led to an increase in unemployment due to job losses. (UN-Habitat, 2012).

The afore-mentioned challenges need to be addressed by developing a framework that guides the creation of a sustainable city for the future of the region. In order to do so, data has to be available to be implemented to develop a framework. According to Hilmi et al (2015), the availability of data is an important factor to include in the development of indicators. In the meantime, there is a challenge in terms of both clear indicators and frameworks to apply successfully at the local levels in cities in the MENA Region (Hilmi et al. 2015).

The aim of the research is to develop the ALISA framework and apply it in a difficult city context. The implementation of the ALISA framework in the post-conflict city of Benghazi and a city crowded with refugees (Amman) is the original contribution of this research. Testing the ALISA framework in challenging cities will give the ability to ALISA to be applied and succeed in many different contexts.

### **1.5 THE RESEARCH QUESTIONS:**

As explained previously in section 1.3 of this chapter, it is essential to have clear indicators to evaluate local challenges and issues in order to achieve sustainable development. Yet in the meantime, there is a lack of both clear indicators and frameworks that can be developed to apply successfully at the local and institutional levels in the MENA Region and particularly in the cities of Benghazi and Amman. This constrains an essential issue for sustainability development estimation which leads to the question addressed in this thesis as follows:

What are the challenges and barriers for cities in the MENA Region to become sustainable?

This primary research question is required to develop an appropriate framework based on finding suitable local and institutional sustainability indicators in the MENA Region, particularly the cities of Benghazi and Amman.

To have the ability to answer this primary question, this research defines the following two significant secondary research questions:

- 1- How can cities develop a framework using appropriate indicators from the local level?
- 2- What kind of institutions, decisions, and policies appropriate to the MENA Region should be developed?

#### **1.6 THE GOALS AND OBJECTIVES OF THE RESEARCH:**

The research will be a development study of the resolution of institutional, economic, social, and environmental development in the MENA region. It also aims to understand and analyse the Approach to Local and Institutional Sustainability Assessment (ALISA) methodology which is a conceptual methodological framework that is developed to apply at certain cities in the MENA region.

The aim of this research is to make an original contribution to demonstrating the development of a bottom-up conceptual framework that would have the capability to address sustainability indicators at the local and institutional levels. The main aim of developing the ALISA framework is to formulate, choose, and prioritize sustainability key indicators, at challenging circumstances cities in the MENA region. Testing the ALISA framework in a stable city where data and facilities are available would be smoother. However, the testing of the ALISA in the city of Benghazi which is a post-conflict place and the city of Amman that has received an influx migrant would be challenging to test the ability of the ALISA framework.

Testing the ALISA framework to develop sustainability indicators would then assist to guide an assessment progress to improve decisions-making and policy-

makers towards sustainability development at the local and institutional levels in the cities of Benghazi in Libya and Amman in Jordan.

The study will also critically examine how the public would respond to such a major change in the way of building cities. This study is aiming to analyse the various factors that affect the procedure of reforming difficult situation cities to sustainability development. For example, communication within the public institutions, the range of public services and the accessibility to these resources, human resources, management technics, transportation, energy sources, and housing projects.

Although several studies have taken place with regard to sustainable cities, this research will aim to discover the appropriate indicators for sustainability at local and institutional levels in a North African city (Benghazi) and a Middle Eastern city (Amman).

To summarise, the objectives of this research are:

1. To explore and understand the concept of sustainability.
2. To explore and understand the different pillars of sustainability.
3. To examine the appropriate indicators for sustainability.
4. To explore the different theories and frameworks of sustainability indicators development and to develop a conceptual approach to local and institutional sustainability assessment (ALISA).
5. To apply the conceptual approach (ALISA) in difficult situation cities. The North African post-conflict city (Benghazi) and the Middle Eastern capital (Amman) which have had an influx waves of migrants due to the conflicts around it.
6. To evaluate the effectiveness of the conceptual framework (ALISA) through the use of SWOT analysis techniques.

## **1.7 THE OUTLINE OF THE METHODOLOGY OF THE RESEARCH:**

This section includes a general view of the research methodology, steps of the data collection procedure and steps of the data analysis process.

### **1.7.1 GENERAL VIEW OF THE RESEARCH METHODOLOGY:**

This research follows a number of steps in order to achieve the previous objectives and goals. These steps include searching and exploring via already existing literature regarding sustainable cities and sustainable development procedures. It will also look at the procedure of developing a framework and framework implementation as well as formulating and ranking of sustainability indicators.

The purpose of developing a methodological framework in this research is to assist in the process of developing sustainability indicators at the institutions and local levels in the cities of Benghazi and Amman. Developing sets of sustainability indicators will give the ability to all key stakeholders including decision-makers, policy-makers, urban designers and governmental representatives to have a solid base and a stronger ground for decisions and policies in order to establish a process of development. This development would include the 4 dimensions identified by the UNCSD 2001 (Social, Economic, Environment, Institutions).

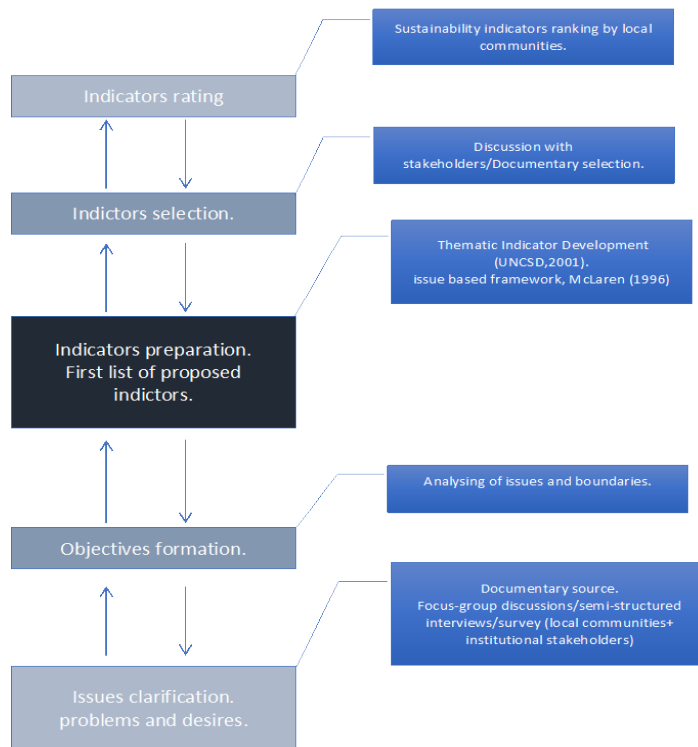
In addition, developing a framework is essential to decision consultants. It is a tool to apply in order to generate a set of important decision-making questions and help organizations improve their practices (Papamichail and Rajaram 2007).

The procedure of the development of the methodological framework for this research starts with exploring the most common problems and challenges identified in literature for the cities of Benghazi and Amman. The challenges and issues of both cities will be examined through conducting semi-structured

interviews and group discussions with a number of people working in the institutions of the cities of Benghazi and Amman.

The following figure 1.1 shows the steps of the approach to local and institutional sustainability assessment (ALISA) conceptual methodological framework. Also, the following section 1.6.2 will illustrate the process of data collection and analysis through the implementation of ALISA.

**FIGURE 1.1 THE ALISA FRAMEWORK STEPS.**



↑  
**Bottom-up**

### **1.7.2 IMPLEMENTATION OF THE ALISA CONCEPTUAL FRAMEWORK:**

Due to the fact that this research uses participatory tools such as Focus-group discussion and semi-structured interviews with a number of key stakeholders in the institutions in Benghazi and Amman, a large amount of the data collected will be a qualitative data. On the other hand, a survey will also take place at the end of the process of development of the indicators. This survey will give the ability to local community's member to rank the set of the sustainability indicators based on their personal perception of priority. Therefore, when appropriate, quantitative data analysis will be used to analyse the data of the ranked indicators collected from the local communities.

Collecting and analysing evidence from multiple sources of data, as opposed to a single source, is recommended for enhancing the quality of the research. Corroboration of findings from more than one data source addresses the issue of construct validity as more than one measure is used in assessing issues of interest (Mills et al. 2009).

After the implementation of the steps shown in figure 1.1 in the city of Benghazi and Amman, the data analysis process will start using the quantitative data analysis software NVivo. In addition, the quantitative part of the data will also be analysed when appropriate by using Microsoft Excel.

### **1.8 THE THESIS STRUCTURE:**

This thesis contains 8 chapters as follows:

#### **CHAPTER 1:**

The first chapter will be the introduction, which is going to illustrates an introduction with regard to the concept of sustainability. This chapter also explains the important points of the Earth Summit (Agenda 21), as well as

introducing the goals and objectives of the research with a brief outline of the methodology of the research and the structure of the thesis.

## **CHAPTER 2:**

The second chapter is the literature review. This chapter will explore the other scholars and writers who have carried out research on the topic of sustainable cities including substantive findings, as well as theoretical and methodological contributions on current papers books and any other sources. This chapter will examine the concept of sustainability in general and sustainability pillars and indicators in particular. As well as exploring why sustainability indicators are needed and what kind of indicators can be used to obtain sustainable cities. Chapter 2 will also provide information about the important chapters of the Earth Summit (Agenda 21) and explore different examples of sustainability indicators framework work.

## **CHAPTER 3:**

This chapter will illustrate the methodology that will be implemented for this research. In this chapter, an explanation of the development of the conceptual approach to local and institutional sustainability assessment (ALISA) framework will be illustrated as well as explaining the steps of the ALISA framework in detail. It will also illustrate the steps of the data collection process based on the combination of the UNCSD Theme Indicators (2001) and the issue-based framework introduced by Maclaren which reflects the issues and challenges of the cities of Benghazi and Amman in order to develop sustainability indicators based on the institutional and local levels.

## **CHAPTER 4:**

Chapter 4 will cover the profiles of the cities for the two case studies which includes the city of Benghazi (Libya) and Amman (Jordan). This chapter explores through the literature to explain the rationale for choosing Benghazi as a first case in this research as well as Amman as a second case study of this research, whilst

identifying the key characteristics and challenges of both cities based on the four dimensions of (UNCSD 2001) for sustainability indicators. In addition, the challenges which are collected from the city profiles are implemented in the ALISA methodology and presented as the documentary source of data for the sustainability challenges in both Benghazi and Amman.

## **CHAPTER 5:**

Chapter 5 describes the implementation steps of the approach to local and institutional sustainability assessment (ALISA) framework in the city of Benghazi. The chapter also includes the steps of creating three different sources of data (Documentary, semi-structured interviews, focus group discussions) in order to develop a unified list of sustainability challenges for the city of Benghazi. In addition, chapter 5 illustrates the steps of reforming the challenges of the city into objectives and then into indicators. Also identifying these indicators based on the local community's perception of priorities.

## **CHAPTER 6:**

Chapter 6 describes the implementation steps of the approach to local and institutional sustainability assessment (ALISA) framework in the city of Amman. This chapter includes the process of developing three sets of challenges based on three different sources of data (Documentary, semi-structured interviews, focus group discussions) in order to develop a unified list of sustainability challenges for the city of Amman.

Furthermore, chapter 6 illustrates the steps of reforming the challenges of the city into objectives and then reform them as sustainability indicators. Also identifying these indicators based on the local community's perception of priorities.



## **CHAPTER 7:**

This chapter contains a comparative analysis between the two cities in terms of the local community's ranking of sustainability indicators. This comparative analysis is classified based on the similarities and differences in the most highly ranked and most low-rank indicators. In addition, chapter 7 includes the implementation of the SWOT analysis in order to test the strengths, weaknesses, opportunities, and threats of the ALISA framework.

## **CHAPTER 8:**

This chapter identifies the answer to the research questions with regard to the development of an appropriate framework that can be implemented in the MENA region cities. This chapter identifies the achievement of the goals and objectives as well as highlighting the limitation of this study. Finally, this chapter also summarises the general findings and results in the conclusion of the research.

### **1.8 SUMMARY:**

This chapter illustrates the outline of the research which is focused on sustainable development in general and sustainability indicators development in particular. The research argues that sustainable development towards the issues facing cities in the MENA region could be the ideal solution. However, starting the process of sustainable cities development requires sustainability indicators.

In order to develop sustainability indicators, data, and frameworks are required. Therefore, this thesis argues that there is a lack of data and information at the local level with regard to sustainability indicators in cities in the MENA region.

This research represents the implementation of the ALISA methodology in two cities in the MENA region. This methodology is based on the combination

between the UNCSO 2001 four sustainability dimensions and the issue-based Framework illustrated by McLaren (1996). The ALISA framework will be implemented to develop sustainability indicators at the local and institutional levels in two difficult cities in the MENA (post conflict city and migration challenge city). The city of Benghazi which is representing a Northern African case and the city of Amman representing a Middle Eastern case.

## **CHAPTER 2**

### **LITERATURE REVIEW.**

#### **2.1 INTRODUCTION:**

To achieve a clearer understanding of the concept of sustainable development and local sustainability indicators, it is important to have a general view of the literature available with regard to sustainability and its principles. This chapter explores the literature related to sustainable development in terms of classifications and definition of sustainable cities, principles of sustainable cities, dimensions of sustainability, Earth summit (Agenda 21) regarding local sustainability and sustainability indicators development frameworks. This will provide an introduction to the methodological framework ALISA illustrated in the following Chapter 3.

#### **2.2 CLASSIFICATIONS AND DEFINITION OF CITIES:**

According to the United Nation report on cities (2013) the common opinion of the definition of a city is the place where characteristics such as population size, paved streets, water supply systems, sewage systems, and electric lighting are available. However, the phase of the number of the population can be different from one country to another. This is due to the difference in the percentage of the population. For example, in India, the standard to classify an urban place from a rural place is by grading if an area holds up to 5000 or more people. In Angola, Ethiopia, and Argentina, the number fell to 2000 or more to classify as an urban space. On the other hand, in Benin, only areas with 10,000 individuals or more are considered as a city (United Nations 2013).

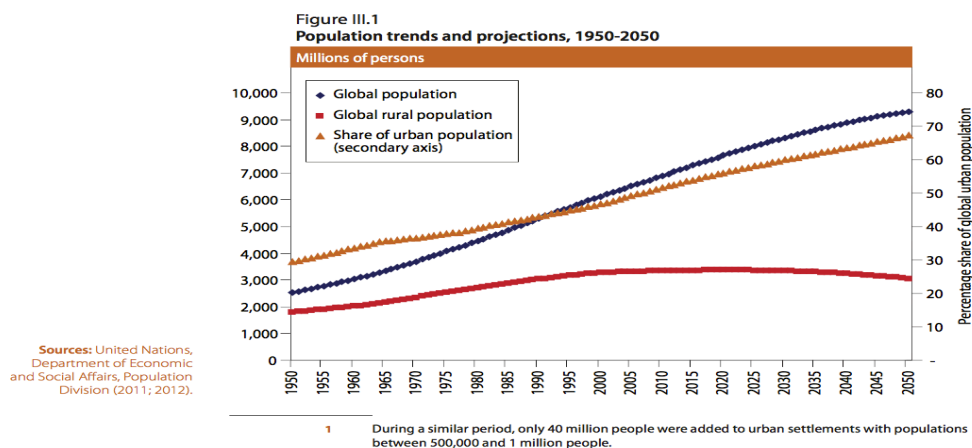
According to the World Bank (2015), more than half of the world's population is located in urban communities. This statistic is expected to grow up to 1.5 times

of the world's growing population located in the urban areas, which add approximately 2 billion more urban residents. The demand for services and day to day living needs increasing, which made it a challenge for local governments to manage. Although the private sector has been successful in improving the usage of technology to deliver more efficient services to the public, cities still need to innovate new approaches to improve the quality of living (World Bank, 2015).

Statistics from the United Nations (2016) Department of Economic and Social Affairs demonstrate that during the years 2000 to 2030, cities would add up more than 60% of the world's population to urban areas. Furthermore, in 2016, there were 512 cities with at least 1 million inhabitants worldwide. Also, by 2030, a projected 662 cities are expected to have at least 1 million residents (United Nations, 2016).

According to the United Nations (2016), 45 cities had a population of approximately between 5 to 10 million people. On the other hand, estimations of the year 2030 illustrate that 10 of these cities are expected to become megacities and about 29 additional cities will cross the 5 million figures between the years 2016 to 2030 (United Nations, 2016).

Figure (2.1) below indicates the expectation of the increase in the overall and the urban population.



Source: United Nations Department of Economic and Social Affairs, population division 2012

### **2.3 WHAT ARE SUSTAINABLE CITIES? (SC):**

Throughout history, according to Rapoport (2014), man has always been contemplating, “what we call utopian” place to live. Over the last 40 years, academics and practitioners in planning and development fields have recommended a variety of approaches to urban development. These developments address concerns about the environment and sustainability. People use the definition of ‘eco-cities’ to describe the transformation of urban projects from only economic points of view to other life aspects (Rapoport 2014).

The definition of eco-cities according to Register (1978) is

‘An urban environmental system in which input (of resources) and output (of waste) is minimized’. (Register 1978: 34)

Does this determine that only the economic aspect is concerned with the definition of an eco-city? On the other hand, Roseland (1997) claims that the definition of an eco-city is including the reduction of the usage of cars; wetland restoration, and affordable housing for the public, which should all be considered as part of an eco-city structure. This definition includes the affordable housing point, which concludes that the social aspect is now part of the framework of building an eco-city (Roseland 1997).

According to Kirkby et al (1995), the inclusion of the social aspect is in building eco-cities, transformed the expression from “eco-cities” to sustainable cities. The development of cities to become sustainable proposes that there can be a constructive connection between goals such as economic growth, environmental protection, and social justice. It concludes that the limits to development are technical, cultural, and social rather than environmental and economical only (Kirkby et al. 1995).

Satterthwaite (1992) argues that the concept of a sustainable city and how it is connected with sustainable development has been examined since the 1990s. Sustainable cities should come to the same line with their “Inhabitant’s development needs without imposing unsustainable demands on local or global natural resources and systems” (Satterthwaite, 1992: 3).

According to Kidd (1992), the policies of sustainability and its corollary have always inspired passionate academic and public debate since 1987 (Kidd, 1992).

According to Parris (2003), depending on the context, the definition of sustainability can be different. Furthermore, sustainability proponents refer to sustainability in various views concerning what is to be sustained or what is to be developed and how to link environment and development, and for how long time (Parris, 2003). According to Buckingham, Susan (2008), a sustainable city is a city that must be economically viable, socially non-violent and environmentally healthy (Buckingham, Susan, 2008).

In addition to that, Girardet, (2004) argues that a sustainable city is a city that allows its residents to meet their basic needs and to raise their level of happiness without damaging the natural environment and human resources (Girardet, 2004). On the other hand, Blackwell (2009) argues that, the growth of the population has affected the quality of living in many cities. For instance, the demand for housing, water supply, electricity, and other services has seen a rise in demand. This in turn has led to local governments and international organizations encouraging more countries to turn towards building sustainable and smart cities (Blackwell, 2009).

Mega and Pedersen (1998) defined a sustainable city as the “One which succeeds in balancing economic, environmental and socio-cultural, progress through processes of active citizen participation” (Mega and Pedersen 1998). According to Basiago (1999), economic sustainability development implies a system that produces and satisfies the present consumption without compromising the needs of the future (Basiago 1999). Imperatives, Strategic (1987) argues that the World Commission on Environment and Development (WCED) defines sustainable development as “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Imperatives, Strategic, 1987: 43).

According to the World Bank (2015), the common way of thinking about sustainable cities is in two phases, an effective economy and a technology-intensive city (World Bank 2015).

Furthermore, ENGIE is a French multinational electric utility company that cooperates as a partner with the UN representative to bring together private and public players along with representatives of civil society which are all driven by common goals to support sustainable urban planning policies, strategies, and practices (ENGIE 2014).

According to ENGIE (2014), a sustainable city is a city for all, where it is pleasant and safe to live in. Due to the differences and diversity between people in the neighborhoods, but also the quality of the infrastructure and the shape of the architecture between areas, with the existence of nature with the city, all together results in the expression of “living together” (ENGIE 2014).

Also, ENGIE (2014) argues that, all of those goals require a reconsidering of a strategy to reshape the city itself. For example, design, construction, and the management of an effective ecosystem where people are in the centre of the process. To do so, there is a demand for an overall approach that includes multi-sectoral, multidisciplinary, and multiple-player. This means, putting together all of the approaches that would indicate to sensible sustainability and efficient quality of living. Also, working at the same time with the techniques of governance, city planning examples, and tools (ENGIE 2014).

According to Hassan (2015) sustainability is the degree to which growth can be achieved based on nature’s gifts and potentials, without destroying nature and allowing nature to sustain itself. This would then give the ability to citizens to improve their social linkages economies without compromising the next generations’ ability to survive (Hassan, 2015 p 14)

Differently, according to the World Bank (2015) report on sustainable cities, a smart city is defined slightly differently: “When we think about Smart Cities, we usually go in one of two directions” (World Bank 2015). As mentioned above, “sustainable cities” are mainly focused on more technical solutions for a more efficient urban metabolism. However, Anand (2018) argues why are there some cities better than others in particular aspects such as innovation, social mobility and equality? (Anand, 2018: 4).

## **2.4 WHY DO WE NEED TO BE CONCERNED ABOUT SUSTAINABLE CITIES?**

According to Harvey (2013), the time has always changed us as human beings, and it is useful to observe how we have been made and remade. The amazing scale of urbanization that has been made for the last hundreds of years illustrates that we have been reshaped several times without realizing how or why. Yet somehow, we still have a lack of systematic critique about the effects of urbanization. For example, what do communities make out of their massive concentrations of wealth and consumerism in most of the cities around the world, as well as what even the United Nation describe as “planet of slums” (Harvey 2013: 4).

Statistics from the United Nations (2016) Department of Economic and Social affairs demonstrate that during the years 2000 to 2030, cities would add up more than 60% of the world’s population to urban areas. Furthermore, in 2016, there were 512 cities with at least 1 million inhabitants worldwide. Also, by 2030, a projected 662 cities are expected to have at least 1 million residents (United Nations, 2016).

Furthermore, according to the United Nation (2016), 45 cities had a population of approximately between 5 to 10 million people. On the other hand, estimations of the year 2030 illustrate that 10 of these cities are expected to become megacities



and about 29 additional cities will cross the 5 million figures between the years 2016 to 2030 (United Nations, 2016).

Therefore Merry (2017) argues that the growth of day-to-day demands has affected the quality of living in many cities. Although the population growth has many positives factors, such as increasing the number of workers, expansion of tax sources, increasing the consumption of the public, expanding local businesses and markets, it leads to a huge consumption on resources and cities (Merry, 2017).

According to Cano Londoño, Natalia A (2019) cities are the hubs of innovation, employment and wealth generation. Urban areas already account for 55% of the global population and produce 85% of the global GDP. However, the way the processes of urbanization are unfolding is also deeply problematic. For example, urban wastes are polluting our air, water and soil resources, and cities account for 75% of the greenhouse gas emissions. Therefore, the issues of global sustainability cannot be addressed, without strongly addressing the question of urban sustainability (Cano Londoño, Natalia A, 2019: 174).

According to Anand (2020), a smart sustainable city (SSC) is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, the efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, and environmental aspects (Anand, 2020).

This then indicates that smartness is depicted as essential for cities to become sustainable. In addition, Smart Africa (2017), explains that there are two major classes of systems are within cities including two types of flows. A flow that runs through a city's infrastructure and services delivered to people and businesses (Smart Africa 2017). The following table 2.1 shows the increase in the urban population in the MENA region according to the United Nations Annual

Percentage of Population at Mid-Year Residing in Urban Areas by Region (The United Nations 2018).

TABLE 2.1 URBAN POPULATION IN THE MENA REGION 1950-2050

MENA Countries	Decades										
	1950	1 960	1970	1980	1990	2000	2010	2020	2030	2040	2050
Algeria	22.2	30.5	39.5	43.5	52.1	59.9	67.5	73.7	78.3	81.6	84.5
Egypt	31.9	37.9	41.5	43.9	43.5	42.8	43.0	42.8	44.8	49.4	55.6
Libya	19.5	27.3	49.7	70.1	75.7	76.4	78.1	80.7	83.6	86.2	88.4
Morocco	26.2	29.4	34.5	41.2	48.4	53.3	58.0	63.5	68.7	73.2	77.2
Sudan	6.8	10.7	16.5	20.0	28.6	32.5	33.1	35.3	39.7	46.0	52.6
Tunisia	32.3	37.5	43.5	50.6	57.9	63.4	66.7	69.6	73.0	76.7	80.2
Iraq	35.1	42.9	56.2	65.5	69.7	68.5	69.1	70.9	73.6	77.0	80.5
Israel	71.0	76.8	84.2	88.6	90.4	91.2	91.8	92.6	93.5	94.5	95.4
Jordan	37.0	50.9	56.0	60.0	73.3	78.3	86.1	91.4	93.2	94.4	95.3
Kuwait	61.5	74.9	85.7	94.8	98.0	99.0	100.0	100.0	100.0	100.0	100.0
Lebanon	32.0	42.3	59.5	73.7	83.1	86.0	87.3	88.9	90.6	92.1	93.4
Oman	8.6	16.4	29.7	47.6	66.1	71.6	75.2	86.3	91.7	93.9	94.9
Qatar	80.5	85.3	88.4	89.4	92.8	96.3	98.5	99.2	99.5	99.6	99.7

<b>Saudi Arabia</b>	<b>21.3</b>	<b>31.3</b>	<b>48.7</b>	<b>65.9</b>	<b>76.6</b>	<b>79.8</b>	<b>82.1</b>	<b>84.3</b>	<b>86.5</b>	<b>88.5</b>	<b>90.4</b>
<b>State of Palestine</b>	<b>37.3</b>	<b>44.0</b>	<b>54.3</b>	<b>62.4</b>	<b>67.7</b>	<b>72.0</b>	<b>74.1</b>	<b>76.7</b>	<b>79.7</b>	<b>82.8</b>	<b>85.5</b>
<b>Syrian Arab Republic</b>	<b>32.7</b>	<b>36.8</b>	<b>43.3</b>	<b>46.7</b>	<b>48.9</b>	<b>51.9</b>	<b>55.6</b>	<b>55.5</b>	<b>61.7</b>	<b>67.2</b>	<b>71.9</b>
<b>Iran</b>	<b>27.5</b>	<b>33.7</b>	<b>41.2</b>	<b>49.7</b>	<b>56.3</b>	<b>64.0</b>	<b>70.6</b>	<b>75.9</b>	<b>80.1</b>	<b>83.4</b>	<b>86.0</b>
<b>United Arab Emirates</b>	<b>54.5</b>	<b>73.5</b>	<b>79.8</b>	<b>80.7</b>	<b>79.1</b>	<b>80.2</b>	<b>84.1</b>	<b>87.0</b>	<b>89.2</b>	<b>90.9</b>	<b>92.4</b>
<b>Yemen</b>	<b>5.8</b>	<b>9.1</b>	<b>13.3</b>	<b>16.5</b>	<b>20.9</b>	<b>26.3</b>	<b>31.8</b>	<b>37.9</b>	<b>44.4</b>	<b>50.8</b>	<b>57.2</b>

**SOURCE: CONSTRUCTED BY THE AUTHOR BASED ON THE UN WORLD URBANISATION PROSPECT REPORT 2018**

According to the table above (2.1) there is a significant increase in the urban population across the MENA region. For example, Kuwait reached 99% of its urban population in the year 2000. Estimations of the table shows that the percentage of urban population in Kuwait has reached 100% from 2010 and onwards to 2050. In addition, Libya and Jordan, have also had an increase in the urban population. According to Buhaug and Urdal (2013), the increase of urban population is due to fact that people seeking to improve their health care as well as improving their economic conditions by seeking employment opportunities which are greater within urban areas. On the other hand, Buhaug and Urdal (2013) agree that, while urban populations generally enjoy a higher quality of life, many cities in the developing world have large slums with populations that are largely excluded from access to resources, jobs, and public services (Buhaug and Urdal, 2013).

This indicates that the increase in the urban population across the MENA region will result in urban issues such as increasing the number of slums which would lead to environmental and social challenges too.

This continued growth that cities are facing has yet to warn us that it is time to start thinking about smart planning. Smart growth was originally thought of as a reaction to a large number of planners who believed that disposing of the undesirable features of continuing growth through “suburban sprawl” is the key to smart planning towards smart urbanization (Downs, 2007).

Haughton (2004) argues that, as cities continue to grow in size and their share of the global population and economical wealth, their environmental will be an essential central point to move towards global sustainability (Haughton, 2004). In addition, cities can act as an early warning indicator for more deep-seated of environmental crises. This is due to the fact that such problems often emerge in cities more quickly and more intensely than elsewhere (Haughton, 2004).

According to Satterthwaite (1997), cities in the global North discourages progress among nations in the global South. The fact that cities in the global South contain three-quarters of the world’ s population as well as a large and growing share of

its economic activity and high-level consumers means that there is a large use of resource, waste generation and greenhouse gas emissions (Satterthwaite, 1997).

Further, one of the more contentious issues in discussions of `sustainable development is in the literature on sustainable development it is found that much of it was almost exclusively concerned with ecological sustainability, with little or no mention of `development' in the sense of the meeting of human needs (Mitlin, 1992). However, Satterthwaite (1997) cities should also be integrated with the social, economic, and political goals of sustainable development (Satterthwaite, 1997).

As mentioned above, the world's population is constantly increasing. According to The Global Goals for Sustainable Development (2021), building sustainable cities to accommodate everyone is needed. For all of the population to survive and prosper, new, intelligent urban planning that creates safe, affordable, and resilient cities with green and culturally inspiring living conditions is essential (Global Goals for Sustainable Development, 2021).

## **2.5 PILLARS OF SUSTAINABILITY:**

Mark Roseland (1997), argues that a survey of several movements that have been floating for more than the last 20 years, improved the readers' understanding of the dimensions of sustainability and the aspects of building an eco or smart city. Moreover, these aspects included, an up-to-date technology, economic and social development plan, the green movement, and social justice (Mark Roseland 1997).

Further, based on the methodology established by Gibson, Aina (2017) highlighted nine principles for sustainable cities. The principles include harmonized coupled human-environment systems, sustainable mobility, sustainable urban metabolism, environmentally friendly building design, civilized neighbourhoods, resilience, democratic governance, plus the satisfaction of human needs and consideration of environmental impacts (Aina, 2017).

Additionally, according to Weiss (1992), the 1992 United Nation Rio de Janeiro conference (Earth summit) which focuses on environment and development. The 1992 Rio conference involved the dimensions and aspects of sustainability and the eradication of unsustainable methods of production and consumption together with approaches to eliminate poverty and improve the role of law and encourage civil societies to engage with the international community (Weiss 1992).

Mestrallet (2013) argues that every city has its strength from human density and diversity, cultural and economic vitality, etc., and that by taking all of these challenges into account, we will build a sustainable city. However, there is no unique model to implement. Additionally, although every city has its territorial diversity, in general, the world has all the same common concerns when it comes to building a sustainable city (Mestrallet 2013).

Those include:

- A dynamic attractive city, which can create a sustainable economic system.
- A city that effectively can control its energy and natural resources without any environmental damage.
- A city that can breathe and keep its environmental impact to the minimum level.
- Finally, an accessible, fluid, and functional city (Mestrallet 2013).

On the other hand, Arcadis (2016) argues that sustainable cities depend on three main pillars. Those are people (social), planet (environment), and profit (economic). Also, the people pillar includes health rate (life expectancy, and obesity rate), an education level (literacy rate and the standard of education institutions), income rate, inequality between individuals, working opportunity, crime rate, and housing. All these indicators can be presented as “quality of life” (Arcadis 2016).

Moreover, Albino et al. (2015) concluded that sustainable cities must have at least four main aspects or characteristics. These include networked infrastructure, commercial and innovative urban development, natural environment, and social presence (Albino et al 2015). According to Aina (2017), the Focus Group on Smart Sustainable Cities (FGSSC), illustrates four main pillars of sustainability. The pillars are economy, governance, environment, and society with some related issues such a public-private partnership, transparency, the progress of the governance, innovation, people, and renewable environmental way of life (Aina 2017).

Also, the hypothetical model of sustainability includes environmental architecture, governance accurate planning and management, data collecting and knowledge, health, people, and renewable energy. These aspects are the main cores of developing a sustainable and smart community (Aina 2017).

On the other hand, Jon (2001) argues, that it takes more than just three pillars for cities to become sustainable. Most researchers concentrate on the three main elements of sustainability. However, culture is a precious factor that has been largely ignored in these challenges where every government plans the future and at the same time evaluates the past. Besides, the involvement of the cultural concept into any framework of city development has essential benefits. For example, culture identifies the community inspirations and values based on the original foundation (Jon, 2001).

Also, culture brings more visibility to practical planning, which is being implemented It brings together all issues that have developed over the past as well as it can help to improve the theoretical strategies and plans to evolves the management of the public sector (Jon, 2001).

In agreement, Hallsmith (2003) argues that when working on a project in Eastern Europe and Burlington city the USA, on how to reform the cities into more sustainable cities, and the main principles were based on the four Es, which are, environment, economic, education, and equity (Hallsmith 2003). However, it was a struggle with how to address all the public input, using the four Es factors, but



they were not everything. The four Es represented more aspects of the community needs based on culture (Hallsmith 2003). On the other hand, Future Learn, (2021) illustrates the popular diagram which includes the three pillars of sustainability (see figure 2.2).

**FIGURE 2.2 ILLUSTRATES THE INTEGRATION BETWEEN THE THREE PILLARS.**



Source: Future Learn, 2021.

There is a connected area between every two pillars. For example, the joint area between the economic and the environmental factors clarify that to balance between those two factors, we would have a “world that is viable to live in”. Also, connecting the social and environmental factors would illustrate a “liveable world”. Moreover, balancing the economic with the social factors would make a “fair world” to live in (European Commission 2015: 7).

### **2.5.1 SOCIAL DIMENSION:**

According to John (2016) referring to social sustainability, means several aspects that includes the rate of health within a city, which includes life expectancy and obesity. Also, education, income inequality, work-life balance, independency ratio, crime, housing, and living cost (John, 2016).

According to Pirsig (1976), quality, in general, is defined as follows: “You know what it is, yet you don’t know what it is. But that is self-contradictory. But some things are better than others, that is, they have more quality. But when you try to say what quality is, apart from the things that have it, it all goes poof” (Pirsig 1976).

According to Hawakes (2001) culture is the fourth of sustainability’s pillars. But what is the exact meaning of culture? ( Hawakes 2001) Culture is “Both the medium and the message – the inherent values and the means and the results of social expression” ( Hawakes 2001 p 3)

Culture involves every element of human connections, starting from family, education, and political and transport system with also leisure, culture celebrations, religion, and the environment. Also, culture and government are connected. The fact that material wealth is a significant aspect to achieve a healthy and happy life, but that should not present culture as less important. Social and economic developments are part of people’s culture. For example, the city of Melbourne on the south coast of Australia includes culture as an essential aspect of life (Hawakes 2001: 7).

Culture to the city is a celebration of what the community has achieved, and where is it from and where is it going to be in the future. The city of Melbourne supports and motivates arts and other cultural activities, which represent Melbourne’s diversity and civil community involvement. Moreover, according to Hawakes (2011), the implementation of culture to demonstrate a sustainable community requires two main rules (Hawakes 2011).

A sustainable city depends on sustainable culture. This illustrates that if the community’s culture collapses, so will everything else. Secondly, to build a socially sustainable society, a strong groundwork is required, and to do so, a cultural action is vitally required. In agreement, the involvement of the fourth pillar for sustainability, a culture will mean creativity, diversity, innovation, and wellbeing (Hawakes, 2011: 8).

According to John (2016), what makes a city sustainable for its people is a question that has been asked more commonly by individuals like planners, developers, and decision-makers. Also, cities are formed by several factors (John, 2016).

For example, culture and other shared values. However, above all, every city's development and characters come from its people. Moreover, when considering creating a sense of community, built and natural assets are taking into account. Despite each city having its style and separate sense of community, however, the scale is important as it helps people to have a strong connection and belonging to their community. Therefore, a successful city would have different neighborhoods with their unique sense, which allows people to have their own identity (John, 2016).

On the other hand, John (2016) also argues that, when the differences and diversity in a city are too big and noticeable, negative effects will take place in the sense of community. Also, people would struggle to build a common identification with their city (John, 2016). However, Jacobs (1998), illustrates that diversity produces a lively city. Firstly, districts around cities have to serve more than just one function, to ensure that people can use the same facilities at different times. Secondly, diversity includes even building (Jacobs 1998). Blocks must be short to increase track options between points of departure and destinations and therefore, economic and social development is delivered (Jacobs, 1998).

Thirdly, buildings have to be at different ages, not all new and not all ancient. This would accommodate different people for different purposes, which would afford different levels of rent. Fourthly, cities have to contain an intense concentration of people, in order to get cities to be more lively places. The presence of these four conditions is important to support cities to generate more diversity and ensure the balance of cities without much dullness (Jacobs 1998).

Alternatively, as every aspect of life, diversity has its disadvantageous. For example, diversity makes the city looks ugly, the cause of traffic congestion, and the invite of damaging uses of public services facilities (Jacobs, 1998). But on the

other hand, Jacobs (1998), argues that this “imaginary theory” of believing that diversity is a negative element on cities, is built on the images of unsuccessful districts and areas, which have not too much but too little diversity (Jacobs, 1998).

Jacobs (1998) also illustrates why the saying that diversity is disadvantageous is only a fantasy. Firstly, anything looks ugly, to be sure if it is done in a bad way. Monotony might be considered as a sort of system; however, it is dull (Jacobs, 1998) In addition, Blackwell (2009) argues that analysing between, crime rate and urbanization design. The methodology can be explored to Figure out the ability of urbanization design to address vulnerability to crime and other security issues (Blackwell, 2009). The more we have variety on the streets or neighborhoods, the better the attraction to cities. Secondly, according to Jacobs (1998), the root cause of traffic congestions is not diversity, this is because vehicles and not the people themselves cause congestions (Jacobs, 1998). Moreover, according to Blackwell (2009), when examining the methods in which crime prevention must be combined with design and development activities, Blackwell illustrates a framework based on a structure, which designed, by Wootton and Davey (2005). This framework contains four main activities in which crime and antisocial behaviour might be addressed.

- Project set-up.
- Project development.
- Use and performance.
- Learning and business strategy. (Blackwell 2009: 147).

Furthermore, Jacobs (1998), illustrates the rate of crime in several American cities and how the rate of crime is connected to the streets. For example, the rates of crime and fear in the streets of Los Angeles undoubtedly high and complex. According to Jacobs, thinning out a city does not make it safer from crime and fear of crime. It is a conclusion that can be drawn within individual cities too, such as superannuated suburbs, which are almost suitable for raping, beating, and mugging (Jacobs,1998).

In agreement, John (2016) argues that creating an atmosphere, which is based on equality, would result in a license of inclusion in its people. In addition, when citizens of a city feel included, they automatically start to collaborate, taking responsibility for their areas, and even succeeding in creating greater wellbeing. When a city is attracting a variety of people, diversity is then presented, and everybody would feel empowered and contributing, which will improve life for all and results in more social sustainability with cities (John 20016). Similarly, Abed and Al-Jokhadar (2021:21) contend that “There is a need for engaging stakeholders in the provision of design principles and practical strategies that aim at pursuing socially sustainable outcomes “(Abed and Al-Jokhadar 2021:21)

First, there must be a clear separation between what the public space is and what the private space is. Secondly, there must be eyes on the streets (meaning windows, doors and public gaze). These eyes belong to the owners of the streets such as the proprietors of the buildings on the streets. And thirdly, the sidewalk of the streets must always have users frequently, for both adding up the number of the eyes watching the streets and to encourage the proprietors in buildings around the streets to watch the sidewalk (Jacobs 1998: 35)

For example, ranking 17<sup>th</sup> on the Sustainable Cities Index of 2016, Berlin is the largest city in Germany; it affords houses for over 3.5 million people. The city’s safety ethnic and diversity are the key to its developed economy. The city attracts a variation of people, and it is the diversity that makes a city creative. Everybody feels involved and part of the dynamic cycle, which runs the city and improves the quality of life to drive the city towards more sustainability (Arcadis 2016).

### **2.5.2 ECONOMIC DIMENSION:**

According to Innovative Governance of Large Urban Systems IGLUS (2018) (an action-research program that seeks to contribute to the better governance of increasingly larger, increasingly complex, and increasingly dynamic urban systems), the bigger the cities the greater the contribution to the economy. A recent study on US cities established an increase in the gap between rural and

urban areas' economic contributing. According to IGLUS (2018) small cities with a population of less than 250,000 have contributed with a negative (-6.5) %, where 53 of big cities have accounted about 96.4% in 2014 (ICLUS, 2018).

Fothergill and Houston (2016) argues that the runaway growth of the city of London as a centre of population and jobs is widely accepted as one of the defining features of 21<sup>st</sup> century Britain. Also, other cities such as Birmingham, Bristol, Leeds, Liverpool, Manchester, Newcastle, Nottingham and Sheffield, and recently augmented by Glasgow (in Scotland) and Cardiff (in Wales) have taking a lead to position their areas to become a regional economic growth (Fothergill and Houston 2016 p 320).

Not only in terms of economic, but also, bigger cities have more social integration. According to Van Winden et al. (2007) bigger cities usually positively linked to urban diversity (bigger cities are more diverse). In terms of accessibility, (bigger cities are more likely to have an international airport and international connections) (Van Winden et al., 2007) In agreement, Jacobs (1998), gives all importance of all kinds of diversity, variety, and multiplicity. Jacobs explains how diversity is linked to the city's economy and how it brings cities to become more lively places to inhabit. In addition, a mixture of users to the public facilities and sufficiently complex to sustain the city's safety and economy requires an enormous diversity (Jacobs, 1998).

On the other hand, Jacobs (1998) argues that not only the first question but the most important question when it comes to planning cities is this: How can cities generate enough mixture of people among diversity throughout their territories to ensure that their civilization is sustained? (Jacobs, 1998). In addition, Basiago (1999) argues that the traditional methods of economic development do not consider the fact that natural resources are limited. These methods also rely on the fact that economic development would bring new technological approaches, which would replenish the destroyed natural resources during the production period (Basiago 1999).

Nowadays, however, a realization has taken place that natural resources are not infinite and policies are driven towards sustainable methods of production and economic growth (Basiago 1999).

It is the urban middle and high-income group's responsibility to use the limited resources and contribute significantly to the production of polluting waste. Moreover, the reform of a city economy to more sustainability should focus more on improving the working conditions for the poor. This includes improving housing, the health care system, water supplies, and electricity (United Nation, 2013).

In agreement, Hallsmith (2003) argues that officials can have the ability to build affordable housing projects, but on the other hand, the environmental groups would complain and take action towards it. This is since such projects would take over the open spaces used by people to walk and have a relaxing time. Furthermore, building a big factory in a city would provide hundreds of jobs, but on the other hand, the air emission and wastewater drainage would minimize the quality of the environment around the city. How can it be possible to have good social service with interfering with citizens and secure well-paid jobs with a healthy environment? (Hallsmith 2003).

Meanwhile, looking at the main elements of a sustainable economy, it is possible to narrow the most important principles to obtain a more sustainable economy. The economic and profit pillar is the pillar that includes, the performance of business perception, evaluating transport facilities (rail, air, and solutions to traffic congestion), the ability to start businesses, GDP per capita, the city's engagement with the international economic network, communication services (mobile networks, and broadband), and the rate of employment. These factors come together to the expression of "economic health" (Arcadis 2016).

On the same line, Harvey (2013), argues that the international financing crisis of 2007 has its roots in the housing market. But on the other hand, Harvey argues that the relationship between capitalism and urbanization needs to be addressed

more theoretically. It is through building cities, housing, and infrastructure, that surplus capital is absorbed. In addition, Harvey argues that we need to build bridges to connect the traditional way of working and urbanization. This is because the two are inseparably connected and always have been (David Harvey 2013).

According to the World Economic Forum (WEF) (2015), there are three key steps to a more sustainable economy, including:

1. Sustained policy commitment.

In high-income nations, low-carbon economic transformation must be confirmed by a variety of policies, not only cost, and these policies must be supported by a sustained commitment from the government.

2. Acknowledge developing country constraints. Governments must supply an appropriate environment including investment in complementary infrastructure. To participate in a low-carbon transition, other countries that have knowledge and solutions must support developing country governments financially and technically.

3. Imagining and building the future economy. The change can be achieved easier if goods production would be made using carbon-neutral or low-carbon raw and recycled materials. For example, the wind turbine can be made by steel, not iron or coke, and server clusters need electricity, not coal (WEF, 2015).

### **2.5.3 ENVIRONMENTAL DIMENSION:**

One of the six strategies that United Nation Environment Program (UNEP) is working on as a part of its move to results-based management of environmental global issues is resource efficiency and sustainable consumption and production. This can be done by focusing on regional and global efforts to ensure that natural resources are produced, processed and consumed in a more environmentally



friendly way (United Nation, 2021).

Occasionally, social, economic, and environmental sustainability pillars are combined in a way that is environmental sustainability is the context within which social and economic life happen. Also, social inequality affects environmental feasibility (The Financial Times, 2018)

To accomplish any environmental sustainability, economic activities need to move from a sense of right-to-exploit the natural resources to a worldview of mutual interdependence and essential eco-innovation. For example, gradually reducing CO2 emission, stop rainforest destruction and increase recycling process (The Financial Times, 2018)

On the other hand, Environmental Science (2018), argues that to protect the environment whether by recycling, reducing our power consumption by switching electronic devices off rather than using standby, or walking short journeys instead of taking the bus to prevent air pollution and reduce carbon emission. Developing technology and biotechnology are the key to elements of environmental sustainability (Environmental Science, 2018).

As mentioned earlier, the pillars of sustainability significantly interact. For instance, the issue of common social justice, such as disintegrating neighborhood infrastructure, and poor access to open spaces such as parks and also access to fresh food (Agyeman, D, & Evans 2002).

These issues are addressed as economic issues from the resident's point of view. However, these issues have always traditionally been represented and overlooked as a sustainability plan that tends to focus on 'green' problems rather than 'brown' problems of urban inequity (Agyeman, D, & Evans 2002). The planet or environment pillar of sustainability indicates how the city's needs of energy and living supplies can function with the lowest risk of environmental damage. For instance, renewable energy shares, green spaces within the city, waste management and recycling, reduction of air pollution, and providing drinking water sources. These aspects could be presented as "green factors" (Arcadis 2016).

In addition, as the other aspects of designing sustainable cities, environmental quality has no recognized procedure to measure yet. Usually, quality is measured for a specific purpose, rather than developing goals in general (Blackwell 2009).

According to John (2016), the environmental pillar includes energy consumption and renewable energy share, green space within the cities, recycling and composting rates, greenhouse gas emissions, natural catastrophe risk, drinking water, and sanitation and air pollution (John, 2016). However, one vital potential site in the 24-hour view of a city is the public park or the green space. Public parks provide rich and environmental sensory to the city (Blackwell, 2009).

Also, green spaces and public parks are the places where the sounds of the city are escaped and noise levels are low. Thus, green spaces can be the places for inviting office employees at lunch or parents with young children (Blackwell, 2009). On the other hand, green spaces can be used by drug dealers and drinkers, and become a place for unpleasant activities (Blackwell 2009). Nevertheless, Jacobs (1998), argues that is not public parks that are not safe. Sidewalks are not the right place for children to play in. Sidewalks are described as the “non-matriarchy” atmosphere for children to play (Jacobs, 1998).

This then illustrates the concept of “safe” city parks, which is a statement that Jacobs seriously challenges due to the lack of observation mechanisms in parks. However, according to Jacobs (1998), successful parks are those being used intensively by a diverse set of residence; such parks usually contain four main foundations. These are intricacy, centring, sun, and enclosure. Intricacy is the diversity of reasons people use parks for, along with centring which makes people who use these parks build a mental concept that parks are their centres Jacobs (1998).

Moreover, John (2016) argues that the availability of green spaces became a more important requirement than ever before reforming a city. Many cities are developing their solutions to address this need. Also, cities are beginning to build

with rather than against nature. For example, New York's High Line transformed an abandoned transport facility into a particularly popular and successful new urban park, which has developed economically around its track (John, 2016). Sun shaded during summer has to be presented in city parks along with building enclosure. But at the same time, building enclosure should not cut the sun from a park if the main reasons were to encourage more usage and presence of people Jacobs (1998). "Most blocks must be short; that is, streets and opportunities to turn corners must be frequent" Jacobs (1998). This then emphasising that environmental concepts should always be counted when building or reforming cities.

### **2.3.4 INSTITUTIONAL DIMENSION:**

The indicator system added to the account of sustainability pillars the role of institutions by adding the institutional dimension as a fourth element to the other three relevant dimensions the economic, social, and environmental as well as the institutional dimension of sustainable development (Pfahl, Stefanie, 2005).

According to the UNCSD (1996), there are 4 sustainability dimensions. These are economic, social, environmental, and institutions. The institutional dimension of sustainable development was added to the other 3 key pillars of sustainability when the UN Commission for Sustainable Development decided, in 1995, to develop indicators for assessing the progress which UN members had made in the implementation of Agenda 21 (UN, 1996).

In order to understand the concept of institutional sustainability, it is important to identify the definition of institutions (Pfahl, Stefanie, 2005). The role of international organizations, states, governments, judicial systems, and social conventions are the institutions that structure the behaviour of actors in communities, their expectations, and relationships, as well as decision-making (Pfahl, Stefanie, 2005).

In this context, institutions are described as an entity with legal personality and staff that acts on its behalf to enforce the rules and implementing its goals within organizations (Pfahl, Stefanie, 2005).

On the other hand, sociology describes institutions as something that helps individuals to facilitate decision making in everyday life demands by offering directions when interpreting the actions of others and defining one's role in a particular societal context (Klouda 2018 p 42).

Parsons (1978) argues that an institution builds a framework for human actions in different contexts. For example, integrating individual behaviour with general value orientations of societies. Not only guide the behaviour of individual but also lead the social and political community (Parsons, 1978). Therefore, institution's structure incentives in human exchange in many aspects including political, social, or economic. Institutional change shapes the way societies evolve through time and hence is the key to understanding historical change (North, 1990).

According to Pfahl (2005) there is an organisational hierarchy of institutions according to their degree of institutionalisation:

- Organisations (legal personality).
- Regimes, systems of rules (connected set of rules and agreements in specific issue area), mechanisms.
- Social norms, traditions (informal rules, property rights, values, normative orientations) Pfahl, Stefanie, (2005).

Wu (2012) illustrates the four dimensions of sustainability indicators developed by UNCSD Theme Indicators. These dimensions include institutional indicators which include the followings:

- 1- Institutional framework.
  - Strategic implementation of sustainability development.
  - International cooperation.

## 2- Institutional capacity.

- Information access.
- Communication infrastructure.
- Science and technology.
- Disaster preparedness and response (Wu 2012).

Pfahl, Stefanie (2005) argues that, when we discuss institutional sustainability in the context of governance for sustainable development, it refers to the type of actions that specific institution linked to the facilitation of decision-making and implementation of sustainability development goals and policies. In other words, more than just stabilising the institution, institutional sustainability must be evaluated based on the institution's capability to coordinate in human interaction in order to achieve specific sustainability goals and policies (Pfahl, 2005).

## **2.6 WAYS TO MAKING CITIES SUSTAINABLE:**

As urbanization and cities expanding by the economic, social, and creativity of opportunities they offer, major challenges in urbanization also appear. According to World Economic Forum WEF (2015), the world's fastest-growing cities have seen problems adjusting to growth and industrialization, choking under the burden of pollution, congestion, and urban poverty (WEF, 2015).

The consumption of food, water, and other natural resources requires an action plan to create innovative solutions to a variety of problems. The World Economic Forum WEF (2015) report argues that, there are 10 urban innovations that can make cities more sustainable including:

1. (Digitally) Re-Programmable Space (developing city's technological services).
2. Water net: An Internet of Pipes (developing water resources systems).

3. Adopt a Tree through Your Social Network (encouraging people to plant trees for green space purpose).
4. Augmented Humans: The Next Generation of Mobility (Improving safety for pedestrians and non-motorized transportation).
5. Co-Co-Co: Co-generating, Co-heating, Co-cooling (improving energy efficiency systems).
6. The Sharing City: Unleashing Spare Capacity (improving housing capacity systems).
7. Mobility-on-Demand (improving traffic capacity).
8. Medellin Revisited (improving infrastructure for Social Integration).
9. Smart Array (Intelligent Street Poles as a Platform for Urban Sensing).
10. Urban Farming (improving urban farming systems) (WEF, 2015).

On the other hand, Williams (2017) argues that, there are 5 key challenges in order to build sustainable cities. These are, building resilient and sustainable infrastructure, reinvent urban environments to enhance livability and enable sustainable lifestyles, develop efficient ways to supply energy to cities, meeting economic challenges based on sustainability standers and finally, encouraging leadership, cooperation, and lifelong learning from all stakeholders in the city to ensure the right vision and approach to obtain sustainable cities (Williams, 2017).

Moldan (2007) argues that in order to establish a sustainable development process, it is increasingly important for sustainability policies to be supported by information flows from heterogeneous sources. Whether this information is economic, social, or environmental, they need to monitor and collected in the form of indicators. Indicators represent, at root, an approach designed to meet this challenge (Moldan, 2007 p 21). The following section will illustrate sustainability indicators and the importance of them to establish sustainability development at city levels.

## **2.7 WHY SUSTAINABILITY INDICATORS NEEDED?**

According to the European Commission (EC) (2015), sustainability indicators are proven to be a successful method to drive towards sustainability. However, the difficulty is based on choosing the appropriate sustainability indicators. This is due to the fact that cities and citizens have different and private standards for evaluations (European Commission 2015).

According to Hallsmith (2003) indicators are the data that tell us something about a system's behavior. In addition, Hallsmith (2003) suggesting that choosing indicators has to be based on the feelings of people that the data which is collected is relevant to a particular concern they have (Hallsmith, 2003).

For example, when collecting indicators for the city of Seattle to monitor the level of the general health of the city's ecosystems, data collectors chose to measure the number of salmon going upstream to spawn every year. This was due to the fact that the health of the salmon is a useful standard of the ecosystem's health as well as the citizens of Seattle value the return of the salmon (Hallsmith 2003). Anand (2017), argues that, cities are generally sharing similar requirements and needs, but that does not necessarily mean that cities share the same concepts of indicators and policy decisions when sustainability is put on the table for future planning. Also, the size of the city can make a difference in order to move towards sustainability. According to Anand (2017), although small towns have the advantages of including fewer diminutions of complexity, on the other hand small towns can be as complicated as big cities (Anand 2017).

According to Moldan (2007), the most difficult challenge facing city policymakers is deciding the future directions of society and the economy in the face of often conflicting requirements for short-term political success, economic growth, social progress, and environmental sustainability (Moldan, 2007: 31).

At this point, making a wrong decision can lead to heavy consequences which will automatically increase people's suffering and maybe lead to crises (Moldan, 2007: 31). Improving decision-making requires a flow of accurate information to understand and prioritize decisions. Therefore, information tools are needed to condense the ability of further exploration about issues of societies. This is the goal of indicators (Moldan, 2007: 31). In the same manner, Jozsa (2005) argues that indicators are a tool that can be used to measure if a community is moving towards or away from sustainability (Jozsa, 2005: 3).

These challenges need to be addressed by developing a framework that guides the creation of a sustainable city for the future of the region. In order to do so data has to be available to be implemented to develop any framework. Furthermore, the availability of data is an important factor to include in the development of indicators. In the meantime, there is a challenge in terms of both clear indicators and frameworks to apply successfully at the local levels in cities in the MENA Region (Hilmi et al. 2015).

## **2.8 WHAT KIND OF INDICATORS ARE NEEDED FOR SUSTAINABLE CITIES?**

According to the European Commission (2015), to build an ideal example of a city that can efficiently run a waste system, build green spaces, implement green infrastructure with a suitable public transport system, and attract businesses to produce green products using the local resource. The behavior and lifestyle of city dwellers play the major role here (European Commission, 2015). In addition, according to the Food and Agriculture Organization of the United Nations (FAO) (2002), there are important considerations for using indicators to move towards sustainability. These include:

- It is not possible to develop indicators unless there is an available good data based on the monitoring.



- All targets must be set in an organized plan to be able to measure performance.
- Different people with different backgrounds and different locations will result in having different considerations. Therefore, indicators must be able to take these values into account.
- Sets of indicators sometimes develop over time and that has to be considered.
- Ability to consider that sets of indicators can be rare based on the situation.
- Indicators can play a vital role in changing systems based on how human activities can have an influence on the environment changes (FAO, 2002).

Moreover, Hilmi et al (2015) argues that the availability of data is another important factor to consider when selecting indicators. Yet in the meantime, there is a lack of both clear indicators and frameworks that can be developed to apply successfully at the local and institutional levels in cities in the MENA Region (Hilmi et al. 2015: 39). Also, the lack of data available for some indicators for MENA countries, such as certain components of the sustainability pillars make it difficult to apply sustainability indices in these countries (Hilmi et al. 2015: 42).

In the same manner Hiremath et al (2013) also argues that, it is an important statement that indicators that have been selected from broad political support are more effective than those given by academic institutions or non – government agencies (Hiremath et al. 2013). On the other hand, Fu and Zhang (2017) argues that, the most important phase in order to measure indicators is the need to address the sustainability demands of the city where it will then start to be applied (Fu and Zhang 2017).

Equivalently, according to the European Union EU (2015) there are no perfect models or standards of indicators between cities. This statement raises the

question of what precisely constitutes a city to become sustainable. (European Union 2015).

Sébastien and Bauler (2013) argues that cities blueprints are a classic example of a database that can be used to develop indicators. Being unable to collect data is considered as one of the most common failings of indicator systems (Sébastien and Bauler 2013). Additionally, Hiremath et al (2013) argues that, there is one thing that is widely agreed upon is that indicators need to be locally relevant. Indicators must be reflecting the geographical and social context of the city (Hiremath et al. 2013).

On the other hand, in terms of working with indicators, a framework has to be created. How can a decision be made to select a framework? Perhaps the best way is by understanding several purposes for which indicators can be used. The following section will explain how frameworks contribute in indicators development process.

## **2.9 HOW TO DEVELOP INDICATORS TO CONTRIBUTE IN PUBLIC POLICY?**

Principally, frameworks can be applied in three ways. As proposed by Fu and Zhang (2017) these include explanatory, pilot, and performance assessment tools. Another challenge in identifying indicators for a framework is, agreeing in what is the shape of the representatives of the indicators, which is the most important when measuring progress towards sustainable development (Fu and Zhang, 2017). In addition, applying a framework that matches the indicators available would improve the work on the four dimensions of sustainable development, which are, environment, economics, social, and governance (Hiremath et al. 2013).

Alshawabkeh (2018) argues that a research on the development of the 2015 Abdali Master Plan (high density mixed-use, HDMU) development in the Abdali area in Amman, Jordan) to examine the Abdali area design and highlight the use

of sustainable urban design principles and exploring whether the Abdali area in Amman achieved the main purpose of its designed. Accordingly, there was a need to research and identify a framework addresses the issues taking advantage of the opportunity to integrate sustainable development solutions to guide future development (Alshawabkeh 2018).

According to Aina (2017), the framework to develop a city into a more sustainable and smarter figure is divided into two groups. The first group is the group which deals with dimensions, characteristics, typologies, and the policies of developing cities to more sustainability. And the second group deals with the procedure, and performance appraisal of smart cities. (Aina, 2017).

According to Sébastien and Bauler (2013) frameworks are designed by a different range of individuals and groups. For example, government agencies, non-governmental organizations (NGOs), and civil society can all be part of shaping and designing frameworks. However, developing indicators is almost impossible without a database (Sébastien and Bauler, 2013). Moreover, Aina (2017) argues that a framework would be used to indicate the components, which should be included in sustainable city development planning (Aina 2017).

In the same manner, Blackwell (2009) suggests that policymakers, planners and clients who have the authority to tackle the problems related to the quality of life and ensure that solutions of today do not become the problems of tomorrow are required that followings:

- Research information about the interaction between social, economic, and environmental problems.
- Addressing the methods in which urban design takes place.
- Presenting all materials relevant to practice and case studies.
- Set up maps, which can support stakeholders to recognize and develop design solutions that allow changes.
- Create methods to test the progress of the design.

- Create methods to monitor the outcomes of the design (Blackwell, 2009).

Furthermore, according to the European Commission (2015), one of the tools used as a framework to indicate sustainability is city blueprints. City blueprints are a tool developed by Water net Amsterdam and KWR Water Cycle Research Institute to provide an estimation of how the sustainable water system is functioning within the city. In addition, the general aim of the city blueprints tool is to provide the stakeholders with a base knowledge to connect urban water management with overall sustainability. The tool is consisting of 24 indicators categorized into 8 groups as follows:

- (1) Water security.
- (2) Water quality.
- (3) Drinking water.
- (4) Sanitation.
- (5) Infrastructure.
- (6) Climate robustness.
- (7) Biodiversity and attractiveness.
- (8) Governance (European Commission 2015).

## **2.10 LEARNING FROM THE EARTH SUMMIT (AGENDA 21):**

The assessment of environmental and ecological footprint has been implemented for more than 50 years Niemi (2004). On the other hand, Wu (2012) argues that the development of sustainability indicators has relatively short history. The main development of sustainability indicators started with the United Nations Conference on Environment and Development (Earth Summit), which was held in Rio de Janeiro, Brazil in 1992 (Wu 2012).

This conference proposed the fundamental principles and the agenda for achieving sustainable development. In other words, the Rio Summit called for the

development of sustainability indicators with its Agenda 21, was enforced by more than 170 national governments (Wu 2012).

Consequently, Wu (2012) argues that the Rio principles and the full implementation of Agenda 21 by a number of international organizations, governmental agencies, NGOs, local communities and corporations, and academic scholars have devoted significant effort to the design and implementation of indicators that evaluate the state and track of environmental conditions and socio-economic development (Wu 2012).

The agenda 21 includes 700 pages with 40 chapters. Its aim is to address the critical issues that the global community face, including the continuous damage to ecosystems, the worsening of poverty, hunger and ill health, increasing world population, and illiteracy. One major objective of the Agenda 21 initiative is that every local government should draw its own local Agenda 21 based on local challenges (Wu 2012).

The agenda 21 contains four main sections which are covering the general range of challenges in regards to sustainable development based on the guidance for governments, local institutions, and other actors involved in the process of sustainability (Spangenburg, 2002). Wu (2012), illustrates the four sections of the agenda 21 as follows:

- Social and economic dimensions. For example, poverty, consumption patterns, health conditions, human settlement development, and development in decision-making.
- Conservation and management of resources for development. For example, protection of the atmosphere, management of land resources, agriculture and rural development, and management of solid wastes and sewage-related issues.
- Strengthen the role of major groups. For instance, action for women towards sustainability, children, and youth in sustainable development and local authorities' initiatives in support of Agenda 21.

- Means of implementation. For example, financial resources and mechanisms, capacity-building in developing countries, and Information for decision-making (Wu 2012).

In sustainable development, all community members are users and providers of information considered in the broad sense. This includes data, information, appropriately packaged experience and knowledge. The need for information arises at all levels, from the top of senior decision makers at both national and international levels to the local communities and individual levels (Wu 2012).

According to the agenda 21 schedule, the following areas need to be implemented to ensure that decisions are based increasingly on information:

- Bridging the data gap;
- Improving information availability (Wu 2012).

According to the Department of Economic and Social Affairs DESA (2001) the 1992 Earth Summit (Agenda 21) recognized the important role that indicators can play in helping countries to make informed decisions concerning sustainable development. This recognition is articulated in Chapter 40 of Agenda 21 which calls on countries at the national level as well as international, governmental and non-governmental organizations to develop and identify indicators of sustainable development that can provide a solid basis for decision-making at all levels (DoESA 2001). This process requires a framework to be implemented.

The Commission on Sustainable Development (CSD) approved in 1995, the program of Work on Indicators of Sustainable Development to help organizations of the UN system, intergovernmental and non-governmental organizations to implement the key elements of the work program. The main objective of the (CSD) Work program was to make indicators of sustainable development accessible to decision-makers at the national level, by defining them, explaining their methodologies and providing training and other capacity building activities (DoESA 2001).

The CSD program was implemented in different countries including Philippines, Ghana, Kenya, South Africa, Maldives, China, Austria, Belgium, Brazil and United Kingdom. Most of the testing countries adopted different approaches to the testing exercise, ranging from plain evaluation of data availability for all or a few selected indicators to embarking on the whole process of developing their own independent set of national indicators while using the CSD indicators as a point of reference (DoESA 2001).

Consequently, many countries pointed out that the testing process was, in general, a successful exercise and sustainability indicators lists were developed based on the CSD theme frame work which includes the four dimensions, social, economic, environmental and institutions (Weiss 1992).

## **2.10 SUSTAINABLE DEVELOPMENT GOAL 11 (SDG 11):**

Identifying the importance of the cities in the modern world, the UN General Assembly in 2015 decided to adopt 'sustainable cities and communities as a distinct goal (SDG 11) under Agenda for Sustainable Development (2030). The overarching aim of SDG 11 is to make cities and human settlements inclusive, safe, resilient, and sustainable (Cano Londoño, Natalia A, 2019: 174).

According to Global Goals for Sustainable Development (2021) there are ten targets (indicators) to create action to make cities and communities sustainable illustrated in table 2.2:

**TABLE 2.2 TEN TARGETS (INDICATORS) FOR THE SDG 11:**

<b>SDG 11 (SUSTAINABLE CITIES AND COMMUNITIES) INDICATORS</b>	
Indicator 1	Safe and affordable housing.
Indicator 2	Affordable and sustainable transport systems.
Indicator 3	Inclusive and sustainable urbanisation.
Indicator 4	Protect the world’s cultural and natural heritage.
Indicator 5	Reduce the adverse effects of natural disasters.
Indicator 6	Reduce the environmental impact of cities
Indicator 7	Provide access to safe and inclusive green and public spaces.
Indicator 8	Strong national and regional development planning.
Indicator 9	Implement policies for inclusion, resource efficiency, and disaster risk reduction.
Indicator 10	Support least developed countries in sustainable and resilient building.

**SOURCE: GLOBAL GOALS FOR SUSTAINABLE DEVELOPMENT, 2021**

On the other hand, Feeny (2020) argues that, SDGs are far more participatory, involving consultation with civil society, the private sector, and the governments of a far greater number of countries. However, it is often argued that the SDGs do not have enough focus on human rights (Feeny, 2020: 345).

According to Hansen (2016) sustainable Development Goal (SDG) 11 is worth mentioning in terms of developing inclusive, safe, resilient and sustainable cities.



However, to the achievement of the SDGs target is possible through the development of strategic plans that depend on characteristics unique to each country, such as understanding the political situation of that particular country, understanding the existing legal framework and cultural, and the economic conditions (Hansen, 2016). In the same manner, Arslan et al (2017) argue that, in order for policy-making to achieve urban sustainability, firstly, it is necessary to determine local and regional priorities related to existing urban structures and then assess their corresponding strengths and weaknesses (Arslan et al. 2017).

In addition, the achievement of the SDGs and their targets are not legally binding. Since many of the SDGs will require actions from multiple governments, the private sector, and civil society, a lack of direct accountability is likely to result in a lot of finger-pointing in the post-2030 era if the goals are not achieved (Feeny, 2020: 346). In the same line, the process of assessing whether or not an SDG has been achieved in 2030 will be impossible in many cases. This is particularly the case for the poorest countries which do not have the resources for extensive data collection (Feeny, 2020: 348).

Although SDGs are considered to be the most effective approach to sustainable development, there are limitations in their usage. Future Learn (2021) argues that there is a number of criticisms of the SDGs, including the goals ignore underlying inequalities in the international system and the goals are top-down and bureaucratic ignoring local context. In other words, one size does not fit all when it comes to achieving sustainable development. Sustainable development goals must be formed on a balance between representing local context and working at the international level to reform institutions (Future Learn, 2021).

## **2.12 ADOPTING A THEME/SUB-THEME FRAMEWORK:**

According to Acton (2000) the use of both qualitative and quantitative indicators as an enabler to help to 'do' sustainable development (SD) is reasonable, however, it does present some immediate issues. These can be summarized as:

- What indicators are used to measure progress towards SD?
- How can they be measured? And how can they be used? (Acton, 2000).

Although, these questions seem to be very simple, yet the answers are complex, highly contested, changeable (in time and place) and multi-dimensional (Bell and Morse 2004).

Following all of these concerns, would lead to sets of sustainable development indicators. According to Bell and Morse (2004) there are indicators framework developed for the region; nation, local government sector, company and even household levels. These frameworks can set in top-down, bottom-up approaches, with advantages and disadvantages to each one (Bell and Morse 2004). Nathan and Reddy (2008), summarize a variety of the main frameworks that can be used to develop sustainability indicators as showing in table 2.3.

Furthermore, table 2.4 shows the bottom-up theoretical frameworks including brief description for each framework such as Soft System analysis theory, and The Natural Step framework. In addition, table 2.5 shows top-down theoretical frameworks including the Thematic Indicator Development (UNCSD,2001). Table 2.6 also shows frameworks illustrated by McLaren 1996, including the Issues based framework, causal framework and Goal-Based framework.

**TABLE 2.3 VARIETY OF THE MAIN FRAMEWORKS THAT CAN BE USED TO DEVELOP SMART AND SUSTAINABILITY INDICATOR:**

Framework	Description	Advantages/ Disadvantages
<b>Capital based (capital accounting) framework.</b>	The capital-based framework has its root in economics. It has been developed before the development of the concept of SD. This framework is also used for environmental accounting where natural resources are accounted as financial resources. It has been recently used in the united nation system of integrated environment and economic accounting (SEEA).	One of its limitations is the suffering from the fact that environment resources are not always easy to quantify, especially the qualitative ones. Also, social indicators are yet to be included alongside with environment – economic accounting framework.
<b>Causal framework.</b>	It introduces the concept of cause-and-effect relationships among diagnostic variables such as indicators. It is structured of three elements (pressure-state-response) (PSR). Pressure is the human	The PSR framework deals only with human responses and not ecological ones. Also, after using the framework by the UN Commission on Sustainable Development (UNCSD), it was abandoned due to the lack of focus on policy.

	<p>activities that have an impact on the process of SD. Where state is the reading of the present state of matters, while response represent the action taken towards SD.</p> <p>This framework was developed and popularized by OECD (2003).</p>	
<p><b>Issue based, goal-oriented or thematic framework.</b></p>	<p>In this framework the indicators are notable on the basis of different models and issues. It emerges the consequence of particular concerns at local, national and global levels. The indicators developed on this framework are goal-driven and directed to the policy. The philosophy here is “no policies without indicator and no indicator without policy”</p> <p>Also, this framework was adopted by the UNCSD.</p>	<p>The idea of linking the indicators to goals enables the users in tracking performance and helps to policy priorities. But on the other hand, some of the goal-oriented frameworks are too precise and pay no attention to the multi-dimensional nature of SD unless it is already accepted by the policy.</p>

<b>Systems framework.</b>	System framework has been developed by Newman <i>et al.</i> (1996). It is based on the concept of extended urban metabolism model (EUMM). EUMM views cities as systems that require inputs of key resources and transform them into desirable liveability outputs and waste. The main desired reform for the system is to improve liveability and reduce waste.	Despite its advantages over other frameworks, system framework is not much in the use like causal frameworks. It has only been used by the Australian Environmental indicators in human settlements in 1998.
<b>Sectoral or domain framework.</b>	This is not a framework by itself but is used mostly in combination with other frameworks. Indicators here can be structured under capital accounting, or causal or thematic or system framework and grouped into different fields before finally listed.	This framework has been used by Seattle sustainable program in 2004, Australian model in 1998 and South Africa in 2004.

**SOURCE: CONSTRUCTED BY THE AUTHOR BASED ON NATHAN AND REDDY (2008)**

In addition, Reed *et al* (2006), provides a summary of sustainability indicator literature and how recommended frameworks can be divided in bottom-up and top-down models as shown in table 2.4 and 2.5:

**TABLE 2.4 BOTTOM-UP THEORETICAL FRAMEWORKS:**

<b>Bottom-Up Theoretical Framework</b>	<b>Brief Description</b>	<b>Source</b>
<b>Soft System Analysis.</b>	It is built on systems thinking and experimental learning to develop indicators as a part of a participatory learning process to enhance sustainability with different stakeholders.	(Checkland, 1991)
<b>Sustainable Livelihoods Analysis.</b>	Develops indicators of livelihood sustainability that can monitor changes in natural, physical, human, social and financial capital based on entitlements theory.	(Scoones, 1998)
<b>Classification Hierarchy Framework.</b>	Identifies indicators by incrementally increasing the resolution of the system component being assessed, e.g., element = soil; property = productivity; descriptor = soil fertility; indicator = % organic matter.	(Bellows, 1995)
<b>The Natural Step.</b>	Develops indicators to represent four conditions for a sustainable society to identify sustainability problems, visions and strategies.	(TNS, 2004)

	<ol style="list-style-type: none"> <li>1. Concentrations of substances extracted from the Earth's crust.</li> <li>2. Concentrations of substances produced by society,</li> <li>3. Degradation by physical means and, in that society...</li> <li>4. People are not subject to conditions that systematically undermine their capacity to meet their needs.</li> </ol>	
<b>Objective or goal oriented</b>	<p>In this framework the indicators are notable on the basis of different models and issues. It emerges the consequence of particular concerns at local, national and global levels. The indicators developed on this framework are goal-driven and directed to the policy. The philosophy here is “no policies without indicator and no indicator without policy” Also, this framework was adopted in Australia, 1998.</p>	Australia, 1998

**SOURCE: CONSTRUCTED BY THE AUTHOR BASED ON REED *ET AL.* 2006**

**TABLE 2.5 TOP-DOWN THEORETICAL FRAMEWORKS:**

<b>Top-Down Theoretical Framework</b>	<b>Brief Description</b>	<b>Source</b>
<b>Panarchy Theory and Adaptive Management.</b>	The Panarchy framework suggests that key indicators fall into one of three categories: wealth, connectivity, diversity	(Gunderson and Holling, 2002)
<b>Orientation Theory.</b>	Develops indicators to represent system “orientates” (existence, effectiveness, freedom of action, security, adaptability, living and psychological needs) to assess system viability and performance	(Bossel, 2001)
<b>Pressure-State-Response.</b>	Identifies environmental indicators based on human pressures on the environment, the environmental states this leads to and societal responses to change for a series of environmental themes.	(PSR, DSR and DPSIR) (OECD, 1993)
<b>Framework for Evaluating Sustainable Land Management.</b>	A systematic procedure for developing indicators and thresholds of sustainability to maintain environmental, economic and social opportunities with present and future generations while maintaining and enhancing the quality of the land.	(Dumanski <i>et al</i> , 1991)



<b>Well-being Assessment.</b>	Uses four indices to measure human and ecosystem wellbeing: a human well-being index, an ecosystem well-being index, a combined ecosystem and human well-being index and a fourth index quantifying the impact of improvements in human well-being on ecosystem health.	(Prescott-Allen, 2001)
<b>Thematic Indicator Development.</b>	Identifies indicators in each of the following sectors or themes: environmental, economic, social and institutional, often subdividing these into policy issues.	(UNCSD,2001)

**SOURCE: CONSTRUCTED BY THE AUTHOR BASED ON REED ET AL. 2006**

Our human activities consume resources and produce wastes and nature needs to have the capacity to meet these demands. The Ecological Footprint is a way to measure our human demand on nature. Every one of us has an ecological footprint. The footprint represents the impact of a person, a household, a city, a business, or a country on nature. By measuring the ecological footprint, we can assist the pressure our lifestyle puts on the planet. This helps to manage our ecological assets more wisely and to take personal and collective actions (Bastianoni et al. 2012).

According to Nathan (2018), The Natural Step (TNS) framework was designed to “apply to situations that do not attempt to establish universal laws but go beyond describing single instances of human activity”. Even though TNS has a significant evolution, however, TNS is based on assumptions with embedded biases and has only recently added more social elements to the system. In addition to that, TNS fails to fully address its concern about the health of the human species (Nathan 2018 p 3).

On the other hand, McLaren (1996) illustrates a variety of sustainability indicators framework in table 2.6:

**TABLE 2.6 SUSTAINABILITY INDICATORS FRAMEWORKS BY MCLAREN, 1996:**

<b>Framework</b>	<b>Description</b>
<b>Goal-Based Frameworks</b>	As its name implies, this type of framework first requires the identification of sustainability goals for a local community and then creates one or more indicators for each goal or combination of goals. The United Kingdom's Local Government Management Board (LGMB) is an example of an agency that favours a goal-based framework.
<b>Domain-Based Frameworks</b>	A domain-based framework starts with the key dimensions of sustainability (environment, economy, and society) and then identifies indicators for each. One of the best-known examples of a domain-based framework can be found in Seattle's sustainability report.
<b>Causal Frameworks</b>	Causal frameworks go beyond the taxonomic approaches of the preceding frameworks by introducing the notion of cause-and-effect relationships. State of the environment (SOE) reporting offers a good example of a causal framework.
<b>Issues-based frameworks</b>	An issues framework is organized around a listing of the key sustainability issues in the local community, such as waste management, air pollution, education,

	<p>employment, etc. An issue framework may have more popular appeal than the other types of frameworks do, because it is readily understandable and easy to construct. On the other hand, this approach lacks the structure found in the abovementioned frameworks.</p>
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**SOURCE :( MCLAREN, 1996)**

According to Reed et al (2006), indicator frameworks are designed to establish and assist the development procedure as follows:

1. Sustainability indicator frameworks must help those developing indicators to institute human and environmental conditions that they are working in.
2. Sustainability indicator frameworks give guidance on how to create management goals for sustainable development.
3. All mentioned sustainability indicator frameworks provide methods to choose the right indicator for measurement progress.
4. All data collected and analyzed (Reed et al, 2006).

According to the Department of Economic and Social Affairs (2001), choosing the appropriate framework would assist in order to develop sustainability indicators. This would identify the gaps in available data and the overall understanding of the human, environmental, and economical system of concerns (DoESA, 2001).

In addition, the Department of Economic and Social Affairs (2001), expert groups, experience, and overall orientation to decision-making needs on Indicators of Sustainable Development are all recommending that the indicator development framework must emphasize on policy issues or the main dimensions of sustainable development (DoESA, 2001).

The theme framework has been developed to address the following attentions. Country recommendations, the inclusion of common priority issues relevant to assessing local sustainable development progress, the request for inclusiveness and balance across the sustainable development field as illustrated in Agenda 21, and limiting the number of indicators to achieve a core list of sustainability indicators (DoESA, 2001).

According to Wu (2012), the best-known example of sustainability indicators development framework has been the 2001 UNCSD theme-based framework that replaced the DSR framework (UNCSD, 2001). The UNCSD theme-based framework has a hierarchical structure: along the four dimensions of sustainable development (social, environmental, economic, and institutional) (Wu 2012).

**TABLE 2.7 ILLUSTRATES THE KEY FOUR DIMENSIONS OF  
SUSTAINABILITY INDICATORS:**

<b>SUB-index</b>	<b>Indicator</b>	<b>Indicator description</b>
<b>Social.</b>	Education	Literacy rate. Education level.
<b>Social.</b>	Health	Mortality. Nutritional Status. Sanitation. Drinking water. Health care delivery.
<b>Social.</b>	Equity	Gender equality. Poverty.
<b>Social.</b>	Population	Population change.
<b>Social.</b>	Housing	Living conditions.
<b>Social.</b>	Security	Crime.
<b>Environment.</b>	Atmosphere	Climate change. Ozone layer depletion. Air quality.
<b>Environment.</b>	Land	Agriculture. Forests. Desertification. Urbanisation.
<b>Environment.</b>	Oceans, sea and coasts.	Coastal zone. Fisheries.
<b>Environment.</b>	Freshwater.	Water quantity. Water quality.
<b>Environment.</b>	Biodiversity	Ecosystem. Species.
<b>Economic.</b>	Economic structure.	Economic performance. Trade. Financial status.
<b>Economic.</b>	Consumption and	Material consumption. Energy use.

	production patterns.	Waste generation and management. Transportation.
<b>Institutional.</b>	Institutional framework.	Strategic implementation of SD. International cooperation.
<b>Institutional.</b>	Institutional capacity.	Information access. Communication infrastructure. Science and technology. Disaster preparation and response.

**SOURCE: BASED ON DEPT OF ECONOMIC AND SOCIAL AFFAIRS 2001**

Furthermore, by linking the indicators mentioned in table 2.7 (UNCSD theme-based framework) and the SDG 11 indicators in table 2.2, it is observable that the UNCSD theme-based Framework Indicators are representing the goals of SDG 11 as shown in table 2.8.

**TABLE 2.8 LINKED (UNCSD THEME-BASED FRAMEWORK) AND THE SDG 11 INDICATORS.**

<b>Indicators number</b>	<b>SDGs 11 (Indicators)</b>	<b>UNCSD theme-based framework indicators</b>
<b>1</b>	Safe and affordable housing.	Housing. Living conditions.
<b>2</b>	Affordable and sustainable transport systems.	Transportation.

<b>3</b>	Inclusive and sustainable urbanisation.	Health. Population. Population change. Mortality. Nutritional Status. Sanitation. Drinking water. Health care delivery.
<b>4</b>	Protect the world's cultural and natural heritage.	Education. Literacy rate. Education level.
<b>5</b>	Reduce the adverse effects of natural disasters.	Atmosphere. Land. Biodiversity. Agriculture. Forests. Desertification. Urbanisation. Climate change. Ozone layer depletion. Air quality. Disaster preparation and response.
<b>6</b>	Reduce the environmental impact of cities	Oceans, sea and coasts. Freshwater. Biodiversity. Ecosystem. Species. Water quantity. Water quality. Coastal zone. Fisheries. Disaster preparation and response.
<b>7</b>	Provide access to safe and inclusive green and public spaces.	Security. Crime
<b>8</b>	Strong national and	Science and technology

	regional development planning.	
<b>9</b>	Implement policies for inclusion, resource efficiency, and disaster risk reduction.	Equity. Consumption and production patterns. Disaster preparation and response. Material consumption. Energy use. Waste generation and management. Gender equality. Poverty.
<b>10</b>	Support least developed countries in sustainable and resilient building.	Economic structure. Institutional framework. Institutional capacity. Information access. Communication infrastructure. Science and technology. Disaster preparation and response. Strategic implementation of SD. International cooperation. Economic performance. Trade. Financial status.

**SOURCE: CONSTRUCTED BY THE AUTHOR BASED ON DEPT OF ECONOMIC AND SOCIAL AFFAIRS 2001 AND GLOBAL GOALS FOR SUSTAINABLE DEVELOPMENT, 2021**



For example, the indicator Housing is one of the UNCSO indicators which can clearly be linked to the 1st indicator of the SDG11 (Safe and affordable housing). In addition to that, the indicators of Education, Literacy rate, Education level (Protect the world's cultural and natural heritage).

On the other hand, some of the UNCSO Indicators would fit in more than one criteria with the SDG11. For example, the indicator Disaster preparations and response can match in 3 indicators of the SDG11 including, (Implement policies for inclusion, resource efficiency, and disaster risk reduction), (Reduce the environmental impact of cities) and (Reduce the adverse effects of natural disasters). Due to the fact that the UNCSO theme-based framework indicators are more detailed and categorized. Therefore, the methodology in this research will be developed based on the UNCSO theme-based framework.

### **2.13 SUSTAINABLE CITY INDICATORS SELECTION CRITERIA:**

The selection of sustainability indicators (SI) criteria is the key of evaluating (SI). Indicators could be too less in numbers to cover a wide-ranging of a city's needs, or they could be too many in numbers that would dilute the goal of the research.

To reach a limited effective number of indicators from larger potential ones, a set of criteria has to be applied. According to Nathan and Reddy (2010), one of the criteria frameworks used to sieve sustainability indicators are the Who, How, What (WHW) framework. The (WHW) framework is a framework that organise the criteria to select the most appropriate sustainability indicators for any case study (Nathan and Reddy, 2010).

This three-dimensional framework follows from the basic understanding of indicators. In other words, the (WHW) framework provides a meaning of communicating information from physical space to users via communicable data (Nathan and Reddy, 2010).

In addition to that, the set of the questions of (WHW) framework will generate answers as follows: What? Is the question for what does this indicator communicate for? In other words, is the indicator relevant to the objective that is supposed to be represent?

How? Is the question of how does this indicator communicate? Is this data readily and could it be made available at a sensible price? Is it appropriate data or has it got too much information in it?

Whom? To whom does this indicator communicate to? Is it being used properly by the aimed group? Is it transparent and accessible to all citizens? Is it clear, understandable and simple? (Nathan and Reddy, 2010)

Moreover, the (WHW) framework has been used in energy domain mostly. Table 2.9 illustrates some examples of the mapping of criteria using WHW framework in different organisations:

**TABLE 2.9** EXAMPLES OF CRITERIA USED IN PAST INITIATIVES WITH WHW FRAMEWORK:

<b>Initiative</b>	<b>Objectives/Goals</b>	<b>Criteria and its communication with WHW framework.</b>
<b>Sustainable Seattle (2004)</b>	To measure the sustainability of Seattle community.	<ul style="list-style-type: none"> <li>• Relevant to objective.</li> <li>• Reflect community value.</li> <li>• Attractive to local media.</li> <li>• Statistically measurable.</li> <li>• Logically and scientifically defensible.</li> <li>• Reliable.</li> <li>• Leading.</li> <li>• Policy relevant.</li> </ul>
<b>United Nation Commission for Sustainable Development (UNCSD, 1999).</b>	To understand the dimensions of sustainability and their interactions. To train and build capacity for counties to develop own set of SDIs. To monitor execution of agenda 21 and its further development.	<ul style="list-style-type: none"> <li>• National in scope.</li> <li>• Relevant to measure sustainable development.</li> <li>• Understandable, clear, unmistakable.</li> <li>• Within the capability of national government.</li> <li>• Conceptually sound.</li> <li>• Limited in number, open ended, adaptable to future needs.</li> <li>• Broad in coverage of Agenda 21.</li> <li>• Representative of international agreements.</li> <li>• Cost effective data with known quality.</li> </ul>

<p><b>EU Local Sustainability Indicator (Ambiente, Italia, 2003)</b></p>	<p>To evaluate the EU Sustainable development strategy and implementation of policy measures.</p>	<p>Capture the core of the problem.  Clear and accepted normative interpretation.  Strong and statistically validated.  Responsive to policy intervention.  Measurable across, and internationally comparable.  Timely and susceptible to revision.  Not a burden disproportionate to its benefits.  Balanced across different dimensions.  Mutually consistent within a theme.  Transparent and accessible to the citizens.</p>
--------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**SOURCE NATHAN AND REDDY, 2010**

On the other hand, Smith (2002) argues that indicators must be clear and understandable to reach the desired goal that it is developed for. indicators must be simple, widely credible; and easily understood by policymakers and the public (Smith, 2002). Also, Santana-Medina et al. (2013) argue that the selection of indicators should not only be based on, however, but indicators must also have a balance between technical criteria and the knowledge and objectives of the local participating parties to ensure that indicators are measurable, comparable, reliable, valid and practical (Santana-Medina et al. 2013). This research aims to ensure that indicators meet these basic criteria. This is due to the fact that indicators in this research will be developed at a local level which emphasis that they must meet the basic criteria (meeting the knowledge of the local communities) to have the most effective results.

The above discussions suggest that there are numerous approaches and frameworks to develop indicators for Sustainable Cities. However, each approach presents some advantages and challenges. Off the shelf approaches suffer from the criticism that they may not be appropriate to a given city context. Bottom-up approaches have the advantage of involving relevant stakeholders but they also suffer from the problem of theoretical validity and inter-city comparability. It is

clear that in reality we may need triangulation and combination of different approaches. This literature review provides insights for the development of ALISA framework and its ground up approach in two complex city case studies.

## **2.14 SUMMARY:**

This chapter illustrated the available literature in terms of classifications and definition of sustainable cities, principles of sustainable cities, dimensions of sustainability including the four dimensions introduced by the UNCSD (social, economic, environment and institutions). In addition, this chapter explained the main goal of the Earth summit (Agenda 21) regarding local sustainability and sustainability indicators development based on the local authorities and governments. Also, exploring the potential of developing sustainability indicators and its contribution to public policies. In addition to that, introducing a number of different frameworks for sustainability indicators development as well as illustrating a number of indicators criteria categories.

This chapter concluded the following points:

- Reviewing the available definitions of sustainability and sustainable cities which helped to understand the meaning of cities that economically capable, socially peaceful, environmentally healthy, and institutionally effective.
- The importance of sustainability indicators and the contribution of indicators in public policies.
- The importance of local sustainability indicators development and why local communities and authorities develop their own framework to develop sustainability indicators to achieve sustainable development and develop a better understanding of decisions and policy-making.
- Examining the existing sustainability indicators framework helped to understand the development of different frameworks. In addition, by reviewing the advantages and disadvantages of each framework, it was

clearer to understand the choice of the combined methodology ALISA which will be explained in more detail in the following chapter 3.

- Finally, through the examination of different selection criteria, the Smith (2002) selection criteria which includes three main points (understandable, simple, and credible) will be chosen to implement in the next chapter. This is due to the fact that the Smith (2002) criteria is the best criteria due to the fact that it can be understood by a large number of local people due to its simplicity. Also, Smith's (2002) criteria are the easiest and shortest to implement, which will be an advantage for this research based on the limitation of the time.
- The following chapter will be the methodology chapter which will explain the methodological framework that will be developed and implemented in this research.

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 INTRODUCTION:**

The aim of this chapter is to define the method, which will be followed and applied for data collecting regarding the research. When choosing to carry out any kind of research, it always depends on the thought-out and careful choice and design of selecting the most accurate methodology. Research can be classified as a careful investigation towards a particular discovery. This journey can be implemented by the process on the subject theory that leads to an investigation, which would result in a direct discovery or support of other particular forms of knowledge (Liu 2008).

This chapter presents the links between research and theory the research design and methodology. It illustrates an overview of the research model and an overview of research approaches including, the quantitative research, the qualitative research and mixed methods research. The chapter will also be categorised into stages; each stage will introduce an explanation of each method including steps to take for implementation and arguments regarding using the effective method.

Furthermore, this chapter illustrates the approach to local and institutional sustainability assessment (ALISA) methodological framework to investigate the process of developing sustainability indicators in two cities in the MENA region including Benghazi in Libya and Amman in Jordan.

In addition, this chapter illustrates the philosophy of the research with regard to developing the ALISA methodological framework as well as the rationale of selecting multiple case studies in the MENA region. It also, explains why Benghazi was chosen to be classified as a Northern African case and Amman as a Middle Eastern case. Moreover, this chapter also includes an explanation regarding generalization in terms of data collection from multiple case studies and the benefits and limitations of multiple case studies.

The general aim of this research is to develop an approach to local and institutional sustainability assessment methodological framework and apply it in the MENA region. An approach that would assist to develop sustainability indicators based on the local community challenges presented by institutional opinions. These indicators are classified based on the four dimensions of sustainability presented by the UNCSO (2001). Also, this approach will help to prioritize these indicators based on the local people's opinions, which then can guide decision and policy-makers to have a better understanding in order to introduce sustainable development decisions.

Consequently, this research conducted findings in the literature review chapter (chapter 2) that says there is a real need for the development of data in order to implement a sustainability process in the MENA region. Therefore, the development of data requires systematic procedure (methodological frameworks) including a number of steps to formulate, select, and prioritize indicators based on the local community perception.

### **3.2 THEORY AND RESEARCH:**

Characterizing the link between theory and research can be very straight forward however, Bryman (2016) argues that there are several challenges here, and particularly two of these challenges can be classified as follows. Firstly, the consideration of the form of the theory has to be clarified and secondly, ensuring that data which is being collected are to test or to build theories (Bryman, 2016).



In addition, theories are significant due to the fact that they can provide a background and justification for the research that is being progressed. Moreover, theories can supply a framework, which can make research clearer to understand and thus resulting in findings that can be properly explained (Bryman 2016: 18).

According to Bryman (2016), 'theory' can be used in various ways; however, its most common meaning is the explanation of observed regularities. For example, the theory that says that working-class people are most likely to suffer from schizophrenia than middle class people (Bryman 2016).

On the other hand, such theories tend not to be the focus of modules in social theory, for instance, the symbolic interactionism theory. This theory is an American theory developed to frame a reference of better understanding of individuals interaction with one another by creating symbolic words and how these words would reshape individual's behaviour (Crossman 2017).

### **3.3 QUANTITATIVE/QUALITATIVE AND MIXED-METHODS RESEARCH:**

As many academics finding it useful to differentiate between quantitative research and qualitative research but, the status of differentiation is slightly mysterious. This is because it is regarded by some writers as fundamental and by others as useless or even sometimes as 'false' (Layder, 1993: 110).

On the other hand, Bryman (2016) argues that, the distinction between quantitative/qualitative research methods is more than just the fact that quantitative researchers employ measurements and qualitative researchers do not. Many researchers have suggested that the variations are deeper than that. For many academics, quantitative and qualitative research differs with respect to their epistemological foundations and other aspects too (Bryman, 2016).

In addition to that, Bryman (2016) illustrates in table 3.1 the fundamental differences between quantitative and qualitative research methods.

**TABLE 3.1: THE FUNDAMENTAL DIFFERENCES BETWEEN QUANTITATIVE AND QUALITATIVE RESEARCH STRATEGIES:**

	<b>Quantitative</b>	<b>Qualitative</b>
<b>Principal orientation to the role of theory in relation to research.</b>	Deductive testing of theory.	Inductive generation of theory.
<b>Epistemological orientation.</b>	Natural science model, in particular positivism.	Interpretivism.
<b>Ontological orientation.</b>	Objectivism.	Constructionism.

**SOURCE: (BRYMAN, 2016 P: 32)**

As explained previously, a quantitative research method is mainly entailing of collecting numerical data. But also, quantitative method does not only mean distinguishing aspects of social research numerically. According to Bryman (2016) the very fact that quantitative method includes distinctive epistemological and ontological position proposes that there is more than just a presence of numbers (Bryman, 2016).

On the other hand, Patton and Cochran (2002), qualitative research method is a research method that is classified by its aims, which relate to analysing some aspects of social life by generating data in the form of words rather than numbers (Patton and Cochran, 2002).

In addition, Patton and Cochran (2002) argue that, for researchers who are more familiar with quantitative methods, the qualitative method then can be criticised as follows:

- The samples collected are small and not capable of representing large number of populations, so it is hard to find out how generalised results are.
- The findings lack accuracy.
- It is difficult to find out how findings are influenced by the researcher him/herself (Patton and Cochran, 2002).

Moreover, the qualitative method usually aims to analysis and answer questions about 'what', 'how', or 'why' rather than 'how many' or 'how much', which are questions that can be answered by quantitative methods (Patton and Cochran, 2002).

It is also noted that qualitative data collection methods are a rich foundation of information regarding real life people issues and social circumstances and having the ability to explain matters such as behaviour and its wider context. But on the other hand, qualitative methods are usually being disapproved for lacking generalizability, and depending mostly on the subjective clarifications of researchers which makes it difficult to be replicated by subsequent authors (Research Methodology, 2017).

Furthermore, mixed research, in its recent history in the social and behavioural or human sciences, started with researchers and methodologists who believed qualitative and quantitative viewpoints and methods were useful as they addressed their research questions (Johnson et al. 2007). This is due to the fact that mixed-method in research, recognizes the importance of traditional quantitative and qualitative research but also offers a powerful third paradigm choice that often will provide the most informative, complete, balanced, and useful research results (Johnson et al. 2007).

### **3.4 CONCEPTUAL THEORETICAL FRAMEWORK (ALISA):**

Based on the research primary and secondary questions, a conceptual framework was developed to be tested as a methodology to collect and classify data. The Approach to Local and Institutional Sustainability Assessment (ALISA) is a methodological framework that is developed to apply at certain cities in the MENA region.

The conceptual framework would have the capability to address sustainability indicators at local and institutional level. In addition, the ALISA framework will be evaluated in chapter (7) by using the Strengths, Weaknesses, Opportunities, and Threats analysis (SWOT).

The main is to develop the ALISA framework to formulate, choose and prioritize sustainability key indicators, which then can assist to guide an assessment progress to improve decision and policy-makers towards the development of sustainable cities at the local and institutional level in the MENA region. Also, I wanted to test the ALISA framework in 2 difficult situations in the MENA region. Testing a framework in a stable city such as Dubai or Doha for example would have been much simpler.

However, the research is aiming to test the effectiveness of the ALISA framework in order to develop sustainability indicators in a post-conflict city in North Africa (Benghazi) and Amman in the Middle East which has had an impact of the issue of refugees. According to Al-Tal and Ghanem (2019), Amman has been subjected to incremental spatial transformation under the pressure of the emerging migration of various refugees since the beginning of the Syrian conflict in 2011 (Al-Tal and Ghanem 2019).

### **3.5 THE RATIONALE BEHIND THE IMPLEMENTATION OF ALISA FRAMEWORK:**

As mentioned previously in chapter 2, many of the sustainability indicator frameworks are applied to classify indicators rather than developing indicators.

The use of ALISA approach would assist the study to develop sustainability indicators without systematic mechanism, which may lead to wide-ranging list of sustainability indicators.

As explained previously, a methodological framework has to be used to formulate, select and prioritise key indicators. This process will be applied with the combination of the UNCSO Theme Indicators Framework and the issue-based Framework illustrated by McLaren (1996), indicators that most directly reflect the issues of a case at its local community and institutional level.

This can be an effective approach which would develop indicators at both (top-down) scientifically valid and (bottom-up) at local and institutional level as well as including the following advantages:

1. The conceptual approach generally, simple and clear and would provide an opportunity for local communities to clarify their needs and develop actions and strategies, which can address and prioritise policies.
2. The framework includes social, economic, environmental and institutional elements in one approach.
3. It can build partnership between local communities and national and international stakeholders.
4. The aims and the development of sustainability indicators in this framework are based on the progress of including various actors in the community.
5. The original contribution of the research is to develop a framework and test it in two difficult situations in the MENA region.

Illustrating these benefits, the combined framework is viewed as being mostly appropriate as a foundation for the development of an approach to local and institutional sustainability assessment (ALISA) for this research.

### 3.6 THE RESEARCH PHILOSOPHY:

Bryman (2016), argues that the inductive approach is an approach that uses a grounded theory method for analysing data. This approach, which was first, used by Glaser and Strauss (1967), is most effective when classifying theories, which come from the data collected. In addition, in a similar way that a deductive strategy is corresponding with the quantitative research method, an inductive strategy is of connecting data and theory is most commonly corresponded with the qualitative research method (Bryman 2016).

According to Bryman (2016), there are six key concepts when conducting a research, these are:

1. Empiricism
2. Positivism
3. Realism
4. Objectivism
5. Constructionism
6. Interpretivism (Bryman 2016).

Flowers (2009) argues that, there are three key paradigms, those of positivist (classical), interpretivism/constructivist (classical), and realist (contemporary) (Flowers 2009). On the other hand, considering different research paradigms, due to the matters of ontology and epistemology. These different paradigms 'encourage researchers to study phenomena in different ways (Flowers 2009). Blaikie (2007) argues that, these aspects are highly relevant to Social Science. Blaikie (2007) also highlights how different kinds of knowledge may be derived through observing the same phenomena from different philosophical perspectives (Blaikie 2007).

Bryman (2016) argues that the expression empiricism can be used in a variety of ways; however, there are two ways that stand out. Firstly, it is used to indicate

that when approaching a study, gaining information and data can only be acceptable when it is collected through experience and reality (Bryman 2016).

In other words, data has to be subjected through testing before it can be classified as knowledge. Secondly, the expression empiricism is attached to the belief that says the accumulation of facts is a legitimate goal in its own. This second meaning is sometimes being referred to as 'naïve empiricism' (Bryman 2016).

In addition, positivism is the term used to describe an approach to a study of society which depends particularly on scientific evidence, such as experiments and statistics, to expose real information of how societies operate. Also, the term positivism expands beyond this definition. It can be taken to entail the following principles:

1. Only phenomena and hence knowledge to senses can be guaranteed as knowledge.
2. The goal of theory is to create hypotheses, which can be examined and therefore will allow explanations of laws to be valued.
3. Knowledge is arrived at through the collecting of facts that provide the basis for laws.
4. Science has to be proceeding in a way that is value free.
5. The last principle is implied by the first. In other words, there is a clear difference between scientific statements and normative statements and a belief that the former is the true domain of the scientist (Bryman 2016)

On the other hand Flowers (2009) argues that positivistic is a position derived from that of natural science and is characterized by the testing of hypothesis developed from existing theory (hence deductive or theory testing) through measurement of observable social realities (Flowers 2009).

Moreover, the third key concept is the realism. The term realism shares two features with positivism, and when a research is conducted, a presence of reality must exist (Bryman 2016).

According to Corson (1991), there are two major forms of realism including:

1. Empirical realism, which asserts that by using the proper methods, reality can be understood. This version of realism is usually called the naive realism, due to the fact that it can be perfect or at least very close based on the consistency between reality and the term used to describe it.
2. Critical realism is a particular form of realism for recognizing the reality of the discourse of the social research which we can only understand and change if we identify the structures at work that generates events for the social research discourse (Corson 1991).

According to Flowers (2009) realism takes aspects of both positivist and interpretive positions. It holds that real structures exist independent of human consciousness, but that knowledge is socially created (Flowers 2009). Moreover, according to Bryman (2016), the fourth key concept is objectivism. This term is described as an ontological position that confirms that social phenomena and their meanings have an existence that is separated of social actors (Bryman 2016).

On the other hand, Binswanger et al. (1990) illustrates objectivism as a philosophical system to study the basic nature of existence. It tells the fundamental principles by which we can make our own choices. Above all, it is a way of having the ability to have the means to make these choices that your mind is valid and the reality you preserve exists (Binswanger et al. 1990). The fifth key concept illustrated by Bryman (2016) is the constructionism. Bryman (2016) illustrates that the expression constructionism is an ontological position that confirms that social phenomena and their meanings are being completed by social actors. This is the opposite of objectivism in that sense (Bryman 2016).



In addition, (Bryman 2016) defines interpretivism as:

“The term that is usually indicates an alternative to the positivism orthodoxy that has dominated the social sciences for decades” (Bryman 2016: 26)

On the other hand, Thompson (2014) argues that, while positivism is collecting statistical data for a particular research method, interpretivism seek to understand what motivates people in a society. For example, when taking a social-class, interpretivism would want to investigate whether or not social-class is classified as a way of determining the decisions people make through talking to them (Thompson 2014).

Cunliffe (2008) describe interpretivism as an anti-positivist (Cunliffe 2008) . On the other hand, Blaikie (2007) describes it as a post-positivist since it is contended that there is a fundamental difference between the subject matters of natural and social sciences (Blaikie 2007).

This then means that interpretivism is constructed and over time, constantly re-constructed through experience resulting in many differing interpretations (Flowers 2009). It is these multiple interpretations that create a social reality in which people act. Therefore, it is seen as important to discover and understand these meanings and the contextual factors that influence, determine and affect the interpretations reached by different individuals (Flowers 2009).

In other words, Interpretive methodology is directed at the understanding phenomenon from an individual's perspective, investigating interaction among individuals as well as the historical and cultural contexts which people inhabit (Creswell 2009: 8).

One of the Examples of the methodology includes case studies (in-depth study of events or processes over a prolonged period) (Scotland 2012). Therefore, implementing the ALISA methodological framework within two case studies to understand and investigate challenges based on the individual's perception and

their opinions among their city's challenges, interpretivism is the philosophy of the methodology applied in this research.

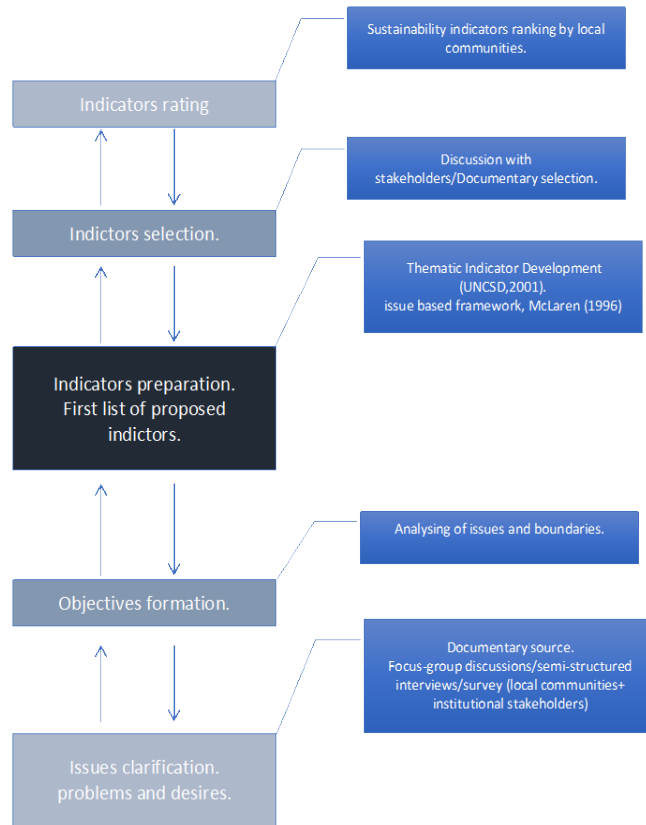
### **3.7 THE RESEARCH METHODOLOGY:**

The conceptual methodological framework, which supports this research with joint documentary and analysed data in two case studies, including focus-group discussions, semi-structured interviews and questionnaires, reflects the approach required to develop a combined framework that assist the development of sustainability indicators.

Valentin and Spangenberg, (2000) argue that, before starting the progress of developing indicators, it is recommended to collect data from local communities to have the assistance needed for decision-makers and policy monitoring and assessment. It is wrong to say that developing sustainability indicators is a purely technical or scientific process rather than an open communication and policy process (Valentin and Spangenberg, 2000).

To achieve this progress and reach the aim of this thesis which is developing a practical approach for sustainability indicators framework that could be used as a tool to develop local and institutional sustainability indicators, appropriate stages must be applied to propose a set of local and institutional sustainability indicators as shown in figure 3.1.

**FIGURE 3.1 ILLUSTRATES THE STEPS OF THE ALISA METHODOLOGICAL FRAMEWORK:**



↑  
**Bottom-up**

## **STEP ONE: ISSUES CLARIFICATIONS:**

The first step in the process of developing ALISA methodological framework is to seek the major issues, desires and challenges with the case study. This step clarifies the main issues of sustainability (social, economic, environment, and institutional) as well as identifying the opinion of the institutional group of people that will be interviewed about sustainability and the challenges of the process of sustainability development.

In this research, documentary sources are used to assist in the progress of clarifying the main issues of sustainability. In addition, the involvement of local institutional participants is very important to create a complete successful document of information and highlight the problems and challenges related to sustainability. According to Wang et al (2018) the developing of an effective data mining technique from multiple data sources to discover useful information is crucially important for decision making (Wang et al. 2018: 1).

Technocrats from institutions will be interviewed to ascertain their views on the challenges which the case studies cities of Amman and Benghazi face concerning sustainability. This is due to the fact that technocrats are trained in various disciplines related to sustainability such as health and sanitation management, environmental management, renewable energy sources, and social challenges.

Moreover, to start the progress of collecting information, focus-group discussions, semi-structured interviews with a range of stakeholders has to be applied. In this step (issues clarifications) the main step is to recognize problems and challenges by listening and writing the ideas and opinions that have an effect on the progress of sustainability within the cities aimed to study.

## **DOCUMENTARY SOURCE:**

Analysis of documentary sources involves a review from the literature such as books, newspapers, journals, government records, international reports, local and international studies and any other relevant sources of information for the case studies. This information is a useful source of background which can work as a foundation of this study that helps to illustrate more detailed recognition of the problems related to sustainability in the case study.

Documentary source information will give the ability to the stakeholders to have an idea about the main goal of the study and assist the progress of the focus-group discussions and semi-structured interview.

## **FOCUS-GROUP DISCUSSIONS/SEMI-STRUCTURED INTERVIEW:**

Focus-group discussions and semi-structured interviews are effective methods for collecting qualitative information and views from a variety of people. Bryman (2016) argues that focus-group discussions are bound up with the uses of qualitative researching in general (Bryman, 2016). It is a method to use with people who had an experience in a certain subject, and can be interviewed in a relatively unstructured way about the topic (Bryman, 2016).

In addition to that, focus-group discussions can be useful in the process of collecting, clarifying and analysing information. In the context of exploring sustainability within a certain city, focus-group discussions can be a useful method based on the followings:

1. The technique allows the researcher to develop an understanding and to have a view about why people feel that way about a certain topic.
2. In focus-group discussions, individuals including the interviewer will often argue and challenge each other's views.

3. Focus-group discussions, give the researcher the opportunity to study and understand the ways participants make sense of a phenomenon (Bryman, 2016).

The process of focus-group discussions will be ongoing until “foundation” is finally reached. After completing focus-group discussions, data will be evaluated and collected together based on meetings with participants.

The one-to-one Interview is a data collection method, which can give a number of benefits to this study. It also has the advantage of accuracy by concentrating directly on the research topic (Pare, 2004). In addition, Pare (2004) argues that such an interview enables the researcher to have access to a deeper circumstantial data (Pare, 2004).

Based on the purpose of the research, interviews design can be constructed in different ways such as descriptive, explanatory, and exploratory. Myors and Newman (2007), also classify interviews in three different categories, Structured, semi-structured and group interviews. A structured interview is an interview followed by strict questionnaire prepared prior the interview and has very limited flexibility (Myors and Newman, 2007),

Therefore, a semi-structured interview approach will be implemented for this research. This approach can help the researcher to develop the interview into a conversational procedure. This would allow the researcher to have the chance to insert follow-up questions and expand the conversation to write in details something important that was found during the interview as well as having a two-ways discussion between the researcher and the interviewee.

In the matter of survey questions, approaching members of the community will be based on the fact that the survey questions are easy and understandable to everyone irrelevant of knowledge about sustainability development and sustainable cities.

## **STEP TWO: OBJECTIVES FORMATION/ ANALYSING OF ISSUES AND BOUNDARIES:**

The second step of the framework explores the key problems and challenges regarding local sustainability that are generated from documentary sources, focus-group discussions and semi-structured interviews in step One. This framework must be able to provide full clear understanding of what is needed to develop and accomplish local sustainability.

Throughout the use of information gathered from step one, a reformulation of issues and challenges based on the UNCSO 2001 sustainability indicators dimensions, and a statement of objectives and suggested actions with the support from the research participants will be developed.

In addition to that, these objectives must meet certain criteria. According to Gercheva (2003), it is ideal to have objectives attached to the indicators as well as distributed equally and not focused on only one dimension (Gercheva, 2003). Moreover, objectives must be understandable and acceptable to make sure that they cover the issues illustrated to introduce an attention to the changes needed to achieve local sustainability (Gercheva, 2003) Lastly, the formula of objectives must be as broad as possible to cover all elements of problems (Gercheva, 2003).

One of the main challenges for data collection is the determination of what citizens of Benghazi and Amman need in their cities, and by creating a clear list of objectives, clear and accepted results can be found. According to Bureau of Local Government Development (BLGD) and the Department of the Interior and Local Government (DILG) (2008) once objectives are formulated, identifying policy responses or transforming goals into actions will also be clear (BLGD and DILG, 2008).

Therefore, in this research the formation of the objectives will be conducted through (Inverse Problem Method). According to Subramaniam(2018), in many researching fields such as engineering, physics or applied mathematics, modeling would include predicting the consequences of an already known information. This method is known as the (Forward problem method). On the

other hand, when using the inverse problem method, we usually start with results which were created from the known information (Subramaniyam 2018).

Finally, once objectives are formulated and agreed upon with participants from academic institutions in Benghazi and Amman, which would help the objectives development process by giving their consultations. A progress of developing sensible sustainability indicators will take place.

### **STEP THREE: INDICATORS PREPARATION. FIRST LIST OF PROPOSED INDICTORS:**

Although, the literature is rich with information about sustainability indicators in different cities around the world, each case should be clarified independently.

According to Valentin and Spangenberg (2000), each city has its own confidentiality when considering sustainability indicators development progress. It is also important to acknowledge that the process of developing sustainability indicators would be much more visible when it is developed at a local level (Valentin and Spangenberg, 2000).

By way of explanation, similarities and differences between cities, should be taken into consideration when sustainability indicators are being developed. However, testing the ALISA framework in difficult contexts such as the city of Benghazi and the city of Amman will give originality to the ALISA framework.

In addition to that, Valentin and Spangenberg (2000) argue that, indicators should be illustrated in an easy and understandable way. This is due to the fact that people at local levels who do not have an academic or administrative sustainability background, would find it challenging to understand the reasons why certain indicators are chosen and have priority over others (Valentin and Spangenberg, 2000).



Moreover, indicators will be developed with a consultation and view sharing from the researcher and specialists. This process will include environmental sciences, government participants, non-governmental members (NGOs), academics and any related environmental, economic, social and institutional literature that is available. In addition, based on the differences between the two aimed cities, each city will then have a different and appropriate set of sustainability indicators.

By merging the UNCSD Theme Indicator Framework (2001), (Theme, Sub-Themes, and Indicators) with the Issue- Based Framework, which is a process of reflecting, the most directly challenges of sustainability at a local community, a first list of indicators will be developed. Consequently, this list of indicators will be filtered-using criteria of selecting, which will be illustrated, in the following step.

#### **STEP FOUR: INDICATOR SELECTION:**

In this step, a first set of sustainability indicators will be developed based on an analysing process with a consultation panel of specialists from different sectors but particularly the academic sector. These specialists will meet throughout the snowballing technique.

The preparation of the sustainability indicators list was also based on the characteristics of sustainability indicators created by (Smith 2002) with emphasis on three main factors when preparing sustainability indicators.

These factors are: simple, widely credible and easily understood by public and policy makers (Smith 2002). The rationale behind arranging the panel is that the method would generate more effective information throughout a full discussion about the selection of the appropriate indicators. It is also more effective to have more than a single opinion about the criteria of selecting indicators, which is applied by using the criteria illustrated by (Smith 2002).

In addition, the use of the following steps introduced by Bangkok (2003), will also help to develop a potential list of sustainability indicators.

- Think of possible alternative indicators for each concept.
- Objective, and output, without being too restrictive.
- Conduct internal brainstorming sessions.
- Consult stakeholders and other experts.
- Try to borrow from other projects and studies (Bangkok 2003).

**STEP FIVE: INDICATOR RATING/RANKING:**

At this step, participants from the local communities in Benghazi and Amman, will be kindly asked to rate the level of importance of the sieved indicators list. The rating process will be done using the category of logical order.

In other words, indicators will be rated by the local community through a survey, using the Likert scale as showing in the following table 3.2:

**TABLE 3.2 THE LIKERT SCALE THAT WILL BE GIVEN TO THE LOCAL COMMUNITIES TO RATE THE SUSTAINABILITY INDICATORS:**

<b>Not Important</b>	<b>Less Important</b>	<b>Important</b>	<b>Very Important</b>	<b>Vital</b>
1	2	3	4	5

**SOURCE: (BERTRAM 2007)**

The aim for using Likert scale is the simplicity of the local level participants. Also, the sieved list of indicators, will be ranked by locals using the survey questionnaire illustrated in appendix one. The number of locals aimed to contribute in this process is 70 people; however, there is a probability of increasing the number to 100 depending on the responses received.

The aim of this step is to rate the list of indicators based on the local community's perception of priority to classify a final list of indicators by locals. These final lists can then be ranked based on the rating scale to cover the four dimensions of sustainability: environment, economic, social and institutional.

In addition, the average rate of each indicator can then be calculated using Excel sheets software. This average will represent the value and importance of each indicator individually at the level of local communities in both cities (Benghazi and Amman) which will contribute to public policy and decision making in both cities.

### **3.8 DATA COLLECTION:**

#### **PREPARATIONS:**

According to Goldthorpe et al (1968), there are two major decisions that must be considered when choosing a research site. Firstly, the researcher must be certain that the community in which the research is taking a place is appropriate for testing Goldthorpe et al (1968).

In other words, the community must be ready to accept the idea of research activities. The second decision is the researcher must consider the kind of institutes he/she wants to investigate and be certain about the sampling respondents (Goldthorpe et al, 1968: 2-5).

The research will take place within two different case studies, the Middle Eastern case will be located in Amman, Jordan and the Northern Africa case will be located in Benghazi, Libya. Lists of sustainability indicators will be generated throughout a framework that is illustrated earlier in this chapter. These indicators will be generated at a local and institutional level through focus-group discussions and semi-structured interviews with participants from a number of local and international organizations that are working in both cities. These organizations are working to cooperate with the local government to reform and assist in the process of decisions and policymaking. The testing of the ALISA framework in

two difficult contexts (Benghazi and Amman), will contribute to the knowledge of sustainable cities indicators.

In addition to that, an initial connection will take place with members of the aimed organizations by emails. Once arriving at the aimed cities, direct contact will be organized with members of these organizations using the snowballing sampling method.

In essence, snowballing technique is where research participants help recruit other participants for a test or a case study to collect data. It is usually used where contact with potential participants is difficult to achieve. Using the snowballing technique will lead to arranging a first meeting to illustrate and give a brief idea of the research and its goals. In addition, participants have to sign a consent form for confidentiality (see appendix four)

#### **FOCUS-GROUP DISCUSSION/ SEMI-STRUCTURED INTERVIEW:**

According to Patton and Cochran (2002) one of the most popular methods to generate data is individual interviews or group discussion. Patton and Cochran (2002), argues that interviews in qualitative research method are similar to our daily face to face conversations, however interviews are focused on the researcher's desire for gathering data. Of course, interviews are different from everyday conversations in terms of ensuring that there is reliability and validity in the context (Patton and Cochran, 2002).

In this step (focus-group discussions/ semi-structured interview) which will be a full discussion about the list of UNCSD indicators to explain and clarify the UNCSD 2001 sustainability indicators with the participants of the research.

The discussions and interviews will include the needs of the city and finding the appropriate indicators for the aimed city. The progress will start by collecting data required through the focus-group discussions and semi-structured interviews questions (see appendix two and three), which will include a full discussion about the list of UNCSD 2001 sustainability indicators to explain and find out if these indicators apply to the aimed cities.

In addition, the discussions will also include the needs of the city and finding the appropriate indicators for the aimed city and its needs. Once an initial list of indicators is created, an analysing process will start by using the second step of the methodological framework that classifies the indicators into (problems/objectives/suggestion).

### **SURVEY QUESTIONNAIRE:**

At first, the survey will start with a general research topic that requires to be investigated. This information is gradually tightened up until they become research questions. According to Bryman (2016) the narrowing process from research topic to research questions is based on the results of reading the literature of the topic. In addition to that, planning of the field work can begin once the research questions have been developed (Bryman, 2016).

Correspondingly, the survey developer needs to decide whether the targeted population is suited to be investigated or not, and needs to ensure that the research instrument is managed properly. By 'research instrument' is meant something like a structured interview or self-administrated questionnaire (Bryman, 2016).

Sustainability indicators which are developed through the use of ALISA framework, will be attached to the survey questions and introduced to the local community to request a rating of the list of indicators. This will give the researcher a clearer indication of which indicators are the most and the least important to the inhabitants of the local community.

### **3.9 DATA ANALYSIS:**

To ensure that this study has appropriate results from the qualitative data that will be collected, the researcher must apply a reasonable analytical method.

According to Law et al (2003), in order to have effective results, the researcher must examine the same data from different perspectives to enable the research to have a challenge and interests (Law et al, 2003).

In this research, data will be addressed in several ways. The researcher will start collecting data needed through the focus-group discussions and semi-structured interviews, which will include a full discussion to explain and explore the list of UNCSO 2001 sustainability indicators.

In addition, the discussion will include the needs of the cities (Benghazi, Amman) and finding the appropriate indicators for the aimed cities and their needs. Transcripts from the interviews will be processed using the following analytical approach introduced by Lacey and Luff (2007) that illustrate several steps to analyse qualitative data.

- Transcription is the writing of the information from the recorded interviews verbatim (word by word).
- Organizing your data: it is important to organize data into easily retrievable sections.
- Familiarization: is the beginning of listening to tapes and watching video materials, reading and re-reading data to summarize it before the formal analysing start.
- Coding: is the process of giving the data that has been familiarized with a numerical or a verbal code to be classified into sections.
- Themes: is the process of identifying data into themes to develop better-defined categories. In this research, themes will be at the levels of the institutional and local communities (Lacey and Luff, 2007)

Furthermore, a coding network can then be created and involving different groups that reflect different combinations such as age (adolescents, adults, and elderly), (male, and female), (low income, and high income), (urban, and rural). Therefore,

sampling strategies must always be created based on the goal of the study (Patton and Cochran, 2002).

In this research, participants who participated in the research were given codes based on their career position as follows:

**TABLE 3.3: CODING PARTICIPANTS IN THE RESEARCH:**

<b>Participants</b>	<b>Code</b>
<b>Academics.</b>	(A1), (A2), (A3) etc.
<b>International organisations.</b>	(IO1), (IO2), (IO3) etc.
<b>Consultants.</b>	(C1), (C2), (C3) etc.
<b>Engineers.</b>	(E1), (E2), (E3) etc.
<b>Group discussions.</b>	(GD1), (GD2), (GD3) etc.
<b>Governmental.</b>	(G1), (G2), (G3) etc.

Due to the fact that this research includes a process of numerical data analysis which is the ranking part of the sustainability indicators developed. Therefore, the methodology of the data analysis used in this research will be considered as a mixed method.

Once an initial list of indicators is created, an analysing process will start by using the second step of the methodological framework that classifies the indicators into problems, objectives, and suggestions. This step would then create the first list of sustainability indicators for each city, which then will be sieved by the assistant and consultations of the participants and experts who will participate in the study.

This sieving progress will be based on criteria, which illustrated by (Smith 2002). This criterion is based on three factors which are: simple, widely credible, and easily understood by the public and policymakers (Smith 2002).

The selection of the most appropriate indicators is an important stage. If the number of indicators is too large this could potentially result in diffusion and lack of concentration on the main goals of the research. On the other hand, if the number of indicators is too small, it could potentially lead to a failure to explain and introduce an idea or a result.

Therefore, in order to reach the appropriate number of sustainability indicators, a set of a certain selection of standards must be applied.

### **APPROACHING THE LOCAL COMMUNITY FOR THE SURVEY:**

Approaching members of the community will be based on the fact that the survey questions are easy and understandable to everyone irrelevant of their knowledge about sustainable development and sustainable cities. Questions and choices will be in both languages (Arabic –English), which will give the ability for everyone to answer and to be included.

In addition, the age ranges for participants will be an open range with the minimum age of 18 to ensure that all involved are an inclusive range of people. Therefore, the survey will take place in certain organizations. These are namely, educational institutions such as universities and higher education academies. Health institutions such as hospitals, media outlets can be contacted as well as youth clubs and social clubs.

Various public sector workers such as policemen can be selected. Selecting members of the public in this way ensures that it is very inclusive and all walks of life and their opinions are valued in the study.

The sieved list of sustainability indicators will be attached to a survey questions (see appendix one) and introduced to the local community to request a ranking of the list of indicators. This will give the researcher a clearer indication of which indicators are the most and the least important to the inhabitants of the local community.



Microsoft Excel can be a useful tool to save, analyse and illustrate the data collected from the survey questionnaire and NVivo software will be used to analysis the qualitative part of the data collected through the focus-group discussions and semi-structured interviews.

### **3.10 THE RATIONALE OF THE SELECTION OF THE TWO CASE STUDIES:**

In general, a case study in research is seen in the social and life sciences types of studies (Heale and Twycross 2018). Therefore, case studies can be described as an intensive, systematic investigation of a single individual, group, community, or some other component in which the researcher examines in-depth data relating to several variables (Heale and Twycross 2018).

According to Shakir (2002), the choice of a case study is based on a number of criteria that must include, the accessibility of the locations to the researcher, the availability of data, and the time and resource constraints (Shakir 2002). On the other hand, Yin (1994) argues that the choice of the case study(s) offers the scope to study contemporary phenomena in real-life situations by means of multiple sources of data (Yin 1994: 35-41).

Heale and Twycross (2018) argues that, case studies examine complex phenomena in the natural setting to increase understanding of them. Furthermore, when using case studies approach, this method of research allows the researcher to take a complex and broad topic, and narrow it down into a manageable research question(s). Through the collecting of qualitative or quantitative datasets about the topic, the researcher would be able to gain more in-depth insight into the topic (Heale and Twycross 2018).

According to Heale and Twycross (2018), the first step when using the case studies is defining the single case or identifying a group of similar cases that can then be incorporated into a comparative-case study. This step can be done through conducting information about the topic from different sources including a review of the literature, grey literature, media, reports and more, which serves to

establish a basic understanding of the cases and informs the development of research questions (Heale and Twycross 2018).

In this research, the city of Benghazi, Libya, and the city of Amman, Jordan have been selected as case studies to represent cities in the MENA region in regards to the use of the conceptual methodological framework ALISA. The choice of the two cities was based on the following purposes:

### **THE CITY OF BENGHAZI.**

1. As many of the MENA region countries, Libya shares similar characteristics with regard to social, environmental, economic and institutional challenges. Libya is an oil-rich country which gives the impression of a sense of development. However, the country has been suffering from a number of conflicts since the uprising of 2011. Therefore, Libya would be an interesting North African case for the assessment of the concept of sustainable development as a long-term solution to the current issues of the country.
2. The city of Benghazi is recognized as the city of “change” in Libya. This is due to the fact that the latest uprising of 2011 started from Benghazi. Furthermore, the city is located on the eastern coast of Libya which means that the city shares similar environmental and climate characteristics as other Northern African cities. In addition, Benghazi is classified as the second most populated city in Libya which would represent a large number of opinions when data is collected.
3. Historically Benghazi has been part of the Greek empire, the Arab Muslim empire, and the Ottomans. The location of the city gives it an ideal opportunity to consider the concept of sustainable development.
4. A number of institutions in the city of Benghazi showed interest regarding sustainability and to participate in the research.

5. The researcher is familiar with the city of Benghazi in terms of culture, language, and lifestyle. This will give the researcher an accessible opportunity to collect data from different stakeholders in the city.
6. According to the rapid urbanization and increase in the number of populations in Libya in general and Benghazi in particular, consequently, the challenges in the city will increase. Therefore, implementing a process of sustainability indicators assessment in the city of Benghazi would benefit the city in particular and the region in general for any future development plans.
7. Testing the ALISA framework in a difficult context such as the city of Benghazi which is a post-conflict city would give the ALISA strong contribution to the knowledge of sustainable cities. Testing the ALISA in other cities in the MENA such as Dubai would have been much smoother, however the research aims to test the effectiveness of the ALISA framework in a challenging context.

### **THE CITY OF AMMAN.**

1. The choice of the city of Amman was based on a number of facts. This research is focusing on the MENA region in particular, therefore, it is important to have at least one case from a Northern African city which was represented in the previews section, and a Middle Eastern side of the region which is presented in the city of Amman.
2. Like many cities in the MENA region, the city of Amman is facing numerous challenges at the local level. These challenges have been backed up by the current circumstances that are going on around the region of the Middle East. For example, the effect on the city of Amman from the

conflicts in Iraq and Syria including the increase of migrations, crime rate, economic challenges, and environmental issues.

3. As the first case study was the city of Benghazi which is the second most populated city in Libya, the choice of the city of Amman is also because it is a capital city, unlike Benghazi. This will contribute to the value of the data of the research to compare sustainability indicators between a city and a capital city.
4. In the same line, Amman has been part of the Roman empire, the Arab Muslim empire, and the Ottomans. The location of the city gives it an ideal opportunity to consider the concept of sustainable development.
5. Several institutions and local stakeholders in the city of Amman showed interest regarding sustainability and to participate in the research.
6. The researcher is familiar with the city of Amman in terms of culture, language, and lifestyle, since the researcher is alumni at one of the higher educational institutions in the city of Amman and is familiar with the educational sector in the city. This will give the researcher an accessible opportunity to collect data from different stakeholders in the city.
8. According to several challenges in the city of Amman which are shown in chapter 4, including rapid urbanization, an increase in the number of populations, and migration and security challenges. Consequently, the implementation of the process of sustainability indicators assessment in the city of Amman would benefit the city in particular and the region in general for any future development plans. Testing the ALISA framework in a difficult context such as the city of Amman with the challenges of the refugees from the neighboring countries' conflicts would give the ALISA strong contribution to the knowledge of sustainable cities. Testing the ALISA in other cities in the MENA such as Dubai would have been much

smoother, however the research aims to test the effectiveness of the ALISA framework in a challenging context.

Therefore, the choice of the two above-mentioned case studies will be applicable in order to achieve the goals and objectives of the research. Further, the implementation of the ALISA framework will give the ability to examine the framework in two different contexts. These differences will include the nature of the cities, the economic framework, the social aspect, and the location of both cities.

### **3.11 BENEFITS AND LIMITATIONS OF MULTIPLE CASE STUDIES:**

The data collection process is rather different from conducting single-case research to multiple case research. According to Heale and Twycross (2018), there are some benefits and limitations in order to conduct a multiple case research (Heale and Twycross, 2018). The following table 3.4 illustrates some of the important points in regard to multiple case research:

**TABLE 3.4 BENEFITS AND LIMITATIONS OF THE CHOICE OF MULTIPLE CASE STUDIES:**

<b>Multiple case studies.</b>	
<b>Benefits</b>	<b>Limitations</b>
<ul style="list-style-type: none"> <li>• The ability to analyze the data across different situations unlike when a single case is chosen.</li> <li>• The ability to have more in-depth understanding of the cases.</li> <li>• The ability to have a comparison of similarities and differences between the cases.</li> <li>• Evidences arising from multiple-case studies are usually stronger and more reliable.</li> <li>• The ability for a more comprehensive exploration of research questions and theory development.</li> </ul>	<ul style="list-style-type: none"> <li>• The large volume of data can sometimes be challenging to organize and data analysis and integration strategies need to be carefully thought through.</li> <li>• There is sometimes a temptation to divert away from the research focus.</li> <li>• Reporting of findings from multiple-case research studies are also challenging sometimes, particularly in relation to the word limits for some journal papers.</li> </ul>

**SOURCE: (HEALE AND TWYCROSS 2018), (YIN 2013)**

As shown in table 3.4, there are a number of benefits in the choice of multiple case studies. Therefore, the choice of multiple case studies will be implemented in this research. This then would give the research the ability to analyze different situations in more depth understanding which contributes to a more accurate knowledge of sustainability indicators development.

### **3.12 GENERALIZATION (DATA RELIABILITY):**

Generalization provided an opportunity for a variety of scholars to share their working knowledge and to advance the state-of-the-art (Yin 2013). On the other hand, generalization is essential when confirming the ability to illustrate general findings that have been conducted in a research study (Rowley 2002).

In addition, Polit and Beck (2010) argue that, generalization is an act of reasoning that involves drawing broad conclusions from particular cases—that is, making an implication about the unobserved based on the observed (Polit and Beck 2010). Furthermore, Polit and Beck (2010) clarifies generalization by recognizing that there three different models of generalization, the classic statistical generalization model, analytic generalization, and the case-to-case transfer model (transferability) (Polit and Beck 2010).

Based on the above definitions, generalization can be described as a common ground that would provide a stronger foundation of a research findings. On the other hand, the definitions above also illustrate that generalization can add value to the data of the research depending on the type of research.

Polit and Beck (2010), argues that in quantitative research, generalizability is considered a major standard for evaluating the quality of a study. On the other hand, in qualitative studies, the issue of generalization is even more complicated. The goal of most qualitative studies is to provide a rich, contextualized understanding of human experience through the intensive study of particular cases (Polit and Beck 2010).

On the other hand, generalization requires extrapolation that can never be fully justified because findings are always fixed within a context (Guba 1978). Based on this discussion, generalization in recent qualitative health research, for example, can support qualitative studies to shape the opinions of decision-makers whose actions affect people's life and well-being (Polit and Beck 2010).

According to (Tellis 1997), criticism of generalization is constructed on the explanation of the differences between analytical generalization and statistical generalization. "In analytic generalization, previously developed theory is used as a template against which to compare the empirical results of the case study" (Tellis 1997).

In addition, Yin (2013) argues that analytic generalization can operate as an appropriate logic for generalizing the findings from a case study. By analytic generalization is meant the extraction of a more abstract level of ideas from a set of case study findings. In other words, findings that nevertheless can be classified into newer situations other than the case(s) in the original case study. For case study evaluations, the analytic generalization should aim to apply to other concrete situations and not just to contribute to abstract theory building (Yin 2013).

The development of the ALISA framework can contribute to other research and case studies across the MENA region. This is because the ALISA framework is tested in two difficult situations in the MENA region which gives a common ground to future studies within the same region or any similar context cities globally.

### **3.13 SUMMARY:**

This chapter illustrated in details the methodological framework (ALISA) which will be implemented in two cities (Benghazi, Amman). The combination of the UNCSD (2001) Theme Indicators and issue-based Framework illustrated by McLaren (1996) will assist to develop sustainability indicators at the levels of institutions and local communities.

The ALISA framework will include data from three different sources, documents and literature, semi-structured interviews and focus-group discussions. The combination of the multiple sources of data will reinforce the explanation of the



challenges in the two cities and give alternative key issues in local communities in both cities.

The chapter also explained the rationale behind the implementation of the ALISA framework. In addition, this chapter illustrated the philosophy of the research as well as explaining in detail the procedure of the data collection and data analysis. Furthermore, the chapter explains the rationale of using multiple case studies in this research as shown in table 3.4.

The next chapter will illustrate the profile of both cities (Benghazi, Amman). This will include information from the literature about the two case studies based on the historical, geographical, social, economic, environmental, and institutional dimensions of the cities. This will give the ALISA framework a foundation to start generating data in order to develop sustainability indicators as shown in the following chapters.

## **CHAPTER FOUR:**

### **CASE STUDY CITIES: THE CONTEXT.**

#### **4.1 INTRODUCTION:**

This chapter illustrates a brief description with some important information about the cities of Benghazi and Amman. To implement the two cities as case studies in this research, a requirement of understanding of the geographical, historical, social and economic context has to be illustrated as well as the current government structure.

Through the using of the available literature on the cities of Benghazi and Amman, this chapter will be illustrating the following sections:

1. Geographical/Historical background.
2. Cultural/Social background.
3. Economical background.
4. Environmental background.
5. Institutional/government structure.

#### **CASE STUDY ONE: THE CITY OF BENGHAZI- LIBYA:**

##### **4.2 GEOGRAPHICAL AND HISTORICAL CONTEXT:**

According to the World Factbook (2019), Libya is a country located in North Africa. By the 11<sup>th</sup> century BC, the Egyptians used the name 'Libu' to refer to the African Mediterranean people who were located in the west of Egyptian rule, a name that would later turn into Libya. The country is boarded in the north by the Mediterranean Sea, to the east by Egypt and Sudan, on the south by Chad and Niger and to the west by Algeria and Tunisia. It has a total area of 1,759,540 sq. km (World Factbook, 2019).

Siebens and Case (2012) argues that historically Libya has always been interestingly part of many cultures, from the Greeks to the Romans to Ottomans to the Arabs. Due to the country's strategic location, trading and urbanization has always taken place in Libya. Business trading has always been passing through Libya from the sub-Saharan nations to the northern coast of the Mediterranean. The geographical location was the main reason for many civilizations to settle and continue growing until present days in the country. However, climate and water has always been a challenge for urban development (Siebens and Case, 2012).

In 600 BC, the Greeks settled in the coastal area of west of Egypt and named their territory Cyrenaica which is known by now as Barqa which represents the East side of Libya. In addition to that, two centuries later, Carthage or what is known now as Tunisia, created a trading centre in the region of west Cyrenaica. The region was known as Tripolitania, which is known as Tripoli nowadays as the capital of Libya.

After brutal wars with the Romans, Tripolitania was controlled by the Romans in 146 BC and became part of the Roman Empire in North Africa. In the 6<sup>th</sup> century 431AD, the Byzantines took control of the region of Northern Africa including the two regions of Tripolitania and Cyrenaica. After that, in 642 AD, a powerful Arab army spreading Islam from the Middle East to North Africa took the two regions of Cyrenaica and Tripolitania and the region was controlled over a millennium (Siebens and Case, 2012).

According to Siebens and Case (2012), during that period of time, Tripolitania was controlled by various groups of Arabs and Berbers, and the region was mostly influenced by Carthage in modern days known as Tunisia. On the other hand, Cyrenaica was controlled by mostly Arabs and the region was primarily influenced by Egypt, until 1551 AD, the Ottomans captured both regions and the south area of Libya which is called Fezzan and incorporated the three regions under the rule of the Ottoman Empire (Siebens and Case, 2012).

Also, Siebens and Case (2012) argues that in 1911, the Italians invaded Libya and took control of the three regions from the Ottomans in 1912. Although the Italians invested in developing the area of Tripolitania and enticed European migrants to move there, however in Benghazi the capital of Cyrenaica a Muslim traditional group called Sennusi brotherhood led a political and violent resistance against the Italian rule (Siebens and Case, 2012)

In addition to that, in 1951 the United Nations voted for Libya as an independent country and the three regions (Tripolitania, Cyrenaica and Fezzan) were under the rule of king Sayyid Muhammad Idris bin Muhammad al-Mahdi as-Sennusi (referred to as Idris). In 1969, a military coup under the lead of Muammar Qaddafi took control of the kingdom until 2011, and that is when a revolutionary movement of youth started from the city of Benghazi took over and led to creating a new unstable situation in the country based on what is known as “Arab Spring” (Siebens and Case, 2012).

**Figure 4.1 ILLUSTRATES THE MAP OF LIBYA AND THE LOCATION OF THE CITY OF BENGHAZI.**



**SOURCE: WWW.NBCNEWS.COM 2018**

### **4.3 ENVIRONMENTAL CHARACTERISTICS:**

Since Libya relies primarily on its petroleum industry as an income, climate and environment problems can arise such as CO<sub>2</sub> emission (World Bank Group 2013). According to the World Bank group (2013), CO<sub>2</sub> emission in Libya in 2009 was 10.0 tons per capita. This result indicates that CO<sub>2</sub> emission in Libya is even higher than the average rate of both Arab countries and the United European nations, which are 7.2 and 4.5 tons per capita respectively, but on the other hand, Libya can still be significantly low in gas emission comparing to some petroleum nations such as the United States of America and Saudi Arabia (World Bank Group 2013).

In addition to that, Nation Master (2019) argues that the main reason for CO<sub>2</sub> emission is basically the usage of transportation. Most cities in Libya are largely using cars as a way of daily transportation. According to the Nation Master (2019), passenger cars (per 1,000 people) in Libya were reported at 290 in 2014. In Egypt, passenger cars (per 1,000 people) were reported at 45, where in the UK the number was 519 and in Algeria were reported at 114 (Nation Master, 2019). This indicates that Libya might have an issue of air pollution.

In addition to that, figures from the World Bank (2016) shows that Libya has the highest number of car ownership among the neighbouring countries, and almost 45% lower than the UK. These numbers are directly related to different reasons. For example, the prices of the fuel can affect the number of cars ownership. Through looking at the prices of fuel, it is clearly that Libya has the lowest prices among the other countries mentioned. According to the World Bank (2016), pump price for diesel fuel (US \$ per liter) in Libya was \$ 0.11 followed by \$ 0.15 in Egypt, \$ 0.17 in Algeria and \$1.49 in the UK (World Bank 2016).

Moreover, another major reason for having a large number of private cars in Libya is the absence of reliable public transport in the country. Alhodairi (2012) argues that, it is not unexpected to see that Libyan cities are facing an extraordinary

increase in the number of private cars to travel between cities and town. Absence of efficient public transportation system has doubled the pressure on citizens to have their own cars rather than depending on public services provided from the government. The current public transportation system can be basically described as “improper, irregular, and not according to any specific standard” (Alhodairi, 2012)

**FIGURE 4.2 SHOWS THE TRAIN STATION IN BENGHAZI IN 1930 AND HOW IT HAS BEEN REPLACED BY URBANIZATION DEVELOPMENT IN A PICTURE TAKEN IN 2012.**



**SOURCE: GOOGLE (2014)**

Although cars are important and convenient in terms of networking between cities and towns, they can be one of the reasons behind global warming based on the emission of CO<sub>2</sub>. According to the United Nations Development Programme (2009), statistics shows that it is expected that climate change and the increase of temperature would lead to an increase on the desertification and lack of water resources in the Arab region, as well as facing the problem of poor land capacity (UNDP, 2009)

According to Næss (2006), undeveloped transportation systems can impact sustainability urbanization due to the consumption of the non-renewable energy and the emission of greenhouse gases. In addition, the problem of an undeveloped transportation system can harm the urban environment of a city in general including the effects of traffic noises, air pollution, availability of parking spaces and traffic congestions (Næss 2006).

In addition to that, global warming can also have an impact on the water resources. According to the World Bank Group (2013), statistics show that by 2050 the annual temperature will rise by 2°C which will lead to a decrease on the annual precipitation by almost 7% (World Bank Group, 2013).

According to the Climate to Travel (2019), Benghazi which has an area of 314 km square, has an average of annual rainfall of 258-300 mm/year, where Tunis and Alexandria have an average of rainfall 520mm/year and 196mm/year respectively (Climate to Travel, 2019).

In case of a decrease in the average of rainfall in the Arab region, arable land would be affected. Azzabi (1993) argues that in Libya, the total area of Libya is estimated at 1,760,000 km<sup>2</sup>. Area suitable for agriculture is estimated to be approximately 22,000 km<sup>2</sup> of which 2,390 km<sup>2</sup> dedicated to irrigated agriculture, 15,500 km<sup>2</sup> to rain fed farming, and 140,000 km<sup>2</sup> of natural forest and range lands (Azzabi, 1993).

**FIGURE 4:3 BLOCKED RAIN DRAINAGE IN JULIANA AREA IN BENGHAZI.**



**SOURCE: AUTHOR (2019)**

Furthermore, urbanization and the spreading of cities have affected arable lands in Libya. Azzabi (1993) argues that the traditional farming and grazing in the arable land are also reasons for accelerating the impact of losing green cover as well as increasing the risk of soil salinity and corrosion of the soil, which will lead to erosion in the country (Azzabi, 1993).

Mahmood-Misrati (1983) argues that, the use of land in Libya is directly dependent on the resources of water. A study established by (Mahmood-Misrati 1983), on climate type of soil and the use of land in Libya illustrates that Libya is classified into four climate zones, Moderate, Semi-arid, Arid and Very Arid. The study also classify the soil into seven categories, (1) high quality, (2) good quality, (3) medium quality, (4) satisfactory, (5) poor quality, (6) very poor quality, (7) worst land- unproductive (Mahmood-Misrati 1983). See table 4.1.

**TABLE (4.1): PERCENTAGE OF LAND USE BY CLIMATE ZONE AND SOIL CATEGORY:**

Climate Zone	Year	Percentage of urban use of land based on soil category				
		(1)	(2)	(3)	(4)	(5,6,7)
<b>Moderate</b>	1966	--	0.3	0.4	0.1	0.1
	1978	--	1.3	1.3	0.5	0.3
<b>Semi-arid</b>	1966	12.0	6.5	1.6	0.4	0.03
	1978	14.0	31.0	7.0	1.1	0.06
<b>Arid</b>	1966	10.1	0.5	0.07	0.4	0.2
	1978	20.0	1.1	0.3	0.8	0.6
<b>Very Arid</b>	1966	--	--	0.6	0.7	0.1
	1978	--	--	3.6	2.3	0.4
<b>Total</b>	1966	9.1	1.4	0.4	0.4	0.1
	1978	17.6	6.0	1.6	0.9	0.4

**SOURCE: (MAHMOOD-MISRATI 1983)**



It is clear to observe in table (4.1) that within a decade between the year 1966 and 1978, the higher quality land taken by users almost doubled from 9.1% to 17.6%, as well as the second grad of soil occupied for urban uses increased from 1.4% to 6% (Mahmood-Misrati 1983). This then indicates that there is an issue of misuse of agricultural land.

According to Abdudayem and Scott (2014), Libya's water resources are mainly four, Ground water, which supplies the country with 95% of its water needs. Surface water with only 2% including rainwater and dam constructions (Abdudayem and Scott, 2014). The availability of water resources and the hot climate in Libya is one of the main reasons that population is mostly based on the northern coast of the country.

Purified and treated water from the sea provides only about 2% as well as recycling wastewater which is about 1% of the total water resources (Abdudayem and Scott, 2014). Table 4.2 illustrates the main regions of Libya where groundwater is located. It also explains the area of each region and the amount of the renewable and non-renewable used ground water.

**TABLE 4.2: GROUND WATER DISTRIBUTION IN LIBYA:**

<b>Basin</b>	<b>Area km<sup>2</sup></b>	<b>Renewable 10<sup>6</sup> m<sup>3</sup></b>	<b>Non- renewable 10<sup>6</sup> m<sup>3</sup></b>	<b>Total dissolved solids, mg/l</b>
Jabal al-Akhdar	145,000	200	50	1.000-5.000
Kufra/ as-Sarir	700,000	-	1.800	200-1.500
Jefara plain Region	18,000	200	50	1.000-5.000
Nafusah Al- Hamada	215,000	250	150	1.000-5.000
Murzek	350,000	-	1.800	200-1.500

**SOURCE: (HANAFIAH AND YAACOB, 2017)**

Although some areas in table 4.2 are located in the south of Libya, the most populated areas in the country are the coastal areas where the level of rain is slightly higher and the weather is partially cooler. Also, the data on table 4.2, and based on the fact that the main resource of water in Libya is groundwater, it is clear to see that the areas of groundwater regions are very small comparing to the total area of the country.

This identifies that the situation of shortage of water in Libya. Also, several reasons such as, growing population, the major arid land and desertification under the changing of climate and misuse of land are making the situation even worse.

**FIGURE 4:4 DRIED NATURAL LAKE DUE TO GENERAL WASTE IN BENGHAZI. THE FIGURE SHOWS THAT THE CITY OF BENGHAZI HAS AN ENVIRONMENTAL CHALLENGE REGARDING THE LEVEL OF GROUND WATER.**



**SOURCE: (AUTHOR 2019).**

Also, Aljarari and Peela (2013) argue that the poor sanitation system in Libya in general and in Benghazi, in particular, led to many problems including a high rate of water waste as well as increasing diseases and infections for the public health (Aljarari and Peela 2013).

Furthermore, the issue of poor sanitation system in Benghazi can be measured also in many public places such as hospitals. For example, the Benghazi Medical Centre which is the biggest medical centre in the city is suffering from the issue of a poor sanitation system which is the leading cause of wound infections of patients at the hospital (Aljarari and Peela 2013).

The figure below shows poor sanitation system in Al-Burka area in Benghazi. This shows that some areas in the city of Benghazi are facing an environmental issue of poor sanitation which would lead to other challenges such as pollutions and health issues.

**FIGURE 4.5 POOR SANITATION IN BENGHAZI**



**SOURCE: (AUTHOR 2019)**

In addition to that Hanafiah and Yaacob (2017) argue that the dependence on oil as a central source of income has decreased the agriculture activities to almost 2% in 2007, which limited the arable land and water supply. This then resulted to the problem of domestic food supplies that does not meet the demand of the population. Statistics also shows that the current situation of limited water resources will get even worse. This demand of water resources would eventually result in high budgetary conservation and environmental costs (Hanafiah and Yaacob, 2017).

To cover the shortage in water supply, the Libyan government established the project of the Man-Made River in 1983 (Arab-Water-Council, 2009). The river is a network of pipes that supply the country with 4.5 million m<sup>3</sup>/day of fossil aquifer water from the southern Sahara Desert to the northern coast (Arab-Water-Council, 2009).

Although the project was designed and implemented to be used for agricultural purposes it has been used totally for personal and industrial purposes in Libya's major two cities Tripoli and Benghazi (Mohamed 2013). Additionally, the Man-

Made River has succeeded in satisfying the demand for drinking water in most districts of Libya, however in the long run; these districts will continue to experience a substantial deficit in water supply. This is of course due to the decline in groundwater that is being absorbed from the southern side of the country and increased the consumption by the cities in the north (Mohamed 2013)

The sensible management of the project has had the limitation of water resources as a priority towards water policy. However, the current national policies concentrate mainly on the demand of fresh water at the expenses of food security while the strategy of purification of seawater has been considered as a long-term solution. On the other hand, as water is becoming more rare and expensive, policies to protect arable land and ecological zones from unorganized urbanization have become more popular and accepted (Mohamed 2013).

According to the World Food Programme (WFP) (2011), the share of agricultural projects in the economy which presents only 2% of Libya's GDP has declined due to the rise of the importance of oil. Agricultural sector growth has also decreased in recent years from 9.8% in 2006 to 2.4% in 2010 (World Food Programme 2011).

Furthermore, these problems of the agricultural sector in Libya, are all compounded by the lack of government's push for the development of large state-owned farms, as well as compounded by low yields and production despite the agricultural technology that is provided by the international market. Rapid urbanization has also led to a severe shortage of agricultural workers and heavy reliance on foreign farm laborers mainly in the area of Jebel Akhdar in the north-east near the city of Benghazi (World Food Programme 2011).

#### **4.4 SOCIAL CHARACTERISTICS:**

Mahmood-Misrati (1983) argues that, up until the beginning of the twentieth century, Libya has been considered as a rural country, which mainly depending on seasonal agricultural activities and grazing. Urbanization was limited and

small in size in terms of population which was mainly located on the Mediterranean coast (Mahmood-Misrati 1983).

According to Mahmood-Misrati (1938), in 1911, only four cities in Libya had a population that exceeded the number of 5000 people. All of these cities are based on the Mediterranean coast, and the average of their population was 60,000 inhabitants (Mahmood-Misrati 1983).

The countries of the Arab Maghreb are Algeria, Libya, Mauritania, Morocco and Tunisia and had a total of population of 87.9 million in 2009 (UN-Habitat, 2012). They are all highly urbanized and it is estimated that by 2030, Libya's urban population will reach 83 percent of the total, while Morocco will become the lowest at 69.18 percent. Also, Algeria will have the largest total urban population with 34 million people (UN-Habitat, 2012). This then indicate that there is an increase in the number of urban populations in Libya which will results to urban challenges.

According to UN-Habitat (2012) one of the social challenges in the Maghreb region is the housing development. Securing an affordable housing in the region continues to be a big challenge, and many citizens obtain housing in the informal market (UN-Habitat, 2012). Although the demand has been high for housing in Libya, the government has not constructed the appropriate number of affordable houses for the public since 1980s (UN-Habitat, 2012).

In general, most houses that have been built in Libyan cities including Benghazi are affordable for high-income households which then resulted in a very critical social issue. For example, in Libya, men are delaying marriage until they can find an adequate apartment or a house. This will then increase the spinsterhood ratio in the country (UN-Habitat, 2012).

According to the CNN (2015), about 300,000 females are unmarried yet in Libya, which is about 30% of the total female population. This is due to many factors such as, the civil war that took place in the country since 2011, economic crises and of course the housing issue which has been an issue for a while (CNN/Arabic, 2015).

**FIGURES 4.6 AND 4.7 SHOW UNFINISHED HOUSING PROJECTS DUE TO THE REVOLUTION OF 2011 IN BENGHAZI.**



**SOURCE: (AUTHOR 2019)**



**SOURCE: (AUTHOR 2019)**

Furthermore, another challenge in Benghazi is the level of health care. According to Salam et al. (2011), a study of health care system in the city of Benghazi was conducted on 9 health centres in 2011. The study analyzed the facilities based on the number of staff, equipment, management techniques, and human resources. The study found the followings:

- Enough manpower in each medical centre.
- All centres were equipped with devices - mostly modern, which were used for diagnosis and treatment.
- Most of these facilities had sufficient area as they were specially built for the purpose.
- These facilities work in harmony with the policies and objectives of the Secretariat of Health, Benghazi.

On the other hand, there was a high level of health care provision but also a weak supply of medicines and supplies (Salam et al. 2011).

In addition to that, another important social aspect in Libya and Benghazi in particular is security. For example, the UNSMIL (2015), has documented a number of deaths in custody at the Criminal Investigations Department Benghazi, including the death of 29-year-old Rami Rajab al-Fitouri. It was claimed that he was taken to the Department of Criminal Investigation in Benghazi in 11<sup>th</sup> March 2015, however his family found his body on the 22<sup>nd</sup> of March in the same year (UNSMIL, 2015).

After investigations and reports conducted by the United Nations Support Mission in Libya (UNSMIL), it transpired that Rajab was kidnaped and killed based on suspicion of involvement in assassinations of supporters of the military "Operation Dignity". The UNSMIL (2015) report indicated that, such crimes are taking place in the city because of lack of the transfer to the justice system (UNSMIL, 2015).

The UNSMIL (2015) report classifies the situation in Libya in in general and Benghazi in particular as highly volatile due to the continuing of armed fighting across the country and especially in Benghazi. These violent actions include outrage against personal dignity and kidnapping hostages and destroying or seizing properties that belong to the state of citizens. Therefore, the UNSMIL (2015) recommended a list of actions needs to be applied to control these groups as follow:



- Cessation of all armed groups.
- Immediately cease all forms of violence and give orders to the international law to take actions against the one that refuses (UNSMIL, 2015).

In addition to that, Ali and Ezeah (2017) argues that, waste management is another social challenge that Libya in general and Benghazi in particular is suffering from. According to (Ali and Ezeah 2017) the average household in the capital Tripoli generates about 0.7kg of waste per day. As Benghazi the second most populated city in Libya after Tripoli, the estimation of the amount of waste is not very different (Ali and Ezeah 2017).

According to the European Commission (2009), Libya is suffering from inefficient solid waste management, lack of sanitary landfills as well as a very low efficiency of waste collection (European Commission 2009).

According to Ali and Ezeah (2017), Libya is also suffering from a different type of waste which is hard waste that is generated from conflicts and wars. There are no specific laws regarding legislation for conflict and disasters waste management except law No. 11 of 1971 which regards to civil defense from detections such as unexploded bombs by lifting operations and preparation terms of removal and organizing tools (Ali and Ezeah 2017). Figure 4.8 shows hard waste in a public space in the city of Benghazi.

**FIGURE 4.8 SOLID WASTE IN BENGHAZI**



**SOURCE: (AUTHOR 2019)**

In addition to that Ali and Ezeah (2017) argue that there is also the law No. 184 of 2012 regarding citizens' compensation in cases of natural disasters and calamities. However, Libya still has no clear strategies to deal with conflicts and disasters which produce a huge amount of waste because of the ongoing conflict in the country (Ali and Ezeah 2017).

According to the World Bank report entitled country engagement note for Libya, the conflict in the country has weakened public administration and administration monitoring by the central government which impacted the relationships between the central and local governments. Many municipalities including Benghazi, have originally decentralized from the centralized government to provide basic services such as electricity and water, with the limited recourses available (World Bank 2019).

In addition to that, the World Bank report entitled country engagement note for Libya, the state of Libya has the one of the highest tertiary education rates in the region, yet the country also has one of the world's highest rate of youth

unemployment. This high rate of unemployment is due to the undiversified economy of the country as well as the concentration of employment in the public sector and skills mismatch due to the poor quality of education. This then led to also increase in the increase of local poverty across the country (World Bank 2019).

According to Kennedy (2018), before the assassination of President Muammar Ghaddafi, the poverty rate was so low that fewer people lived in poverty in Libya than in the Netherlands. Today, nearly a third of Libya lives below the poverty line (Kennedy 2018).

In the same manner, Al Shahid (2018) argues that there has been an improvement in the rate of unemployment within the young generation in Libya. The rate of unemployment has decreased from 19% in 2003 to 17.7% in 2013, however the young people of Benghazi are calling on the government to assist in creating more employment opportunities (Al Shahid 2018).

Even though, the substantial revenues from natural resources, coupled with the country's small population, mean that Libya has one of the highest GDPs in Africa, people of Benghazi are suffering from an unemployment issue. In addition, the young people of Benghazi believe that a solution to the problem of the high unemployment rate is to exploit the available natural resources in the country (Al Shahid 2018).

#### **4.5 ECONOMIC CHARACTERISTICS:**

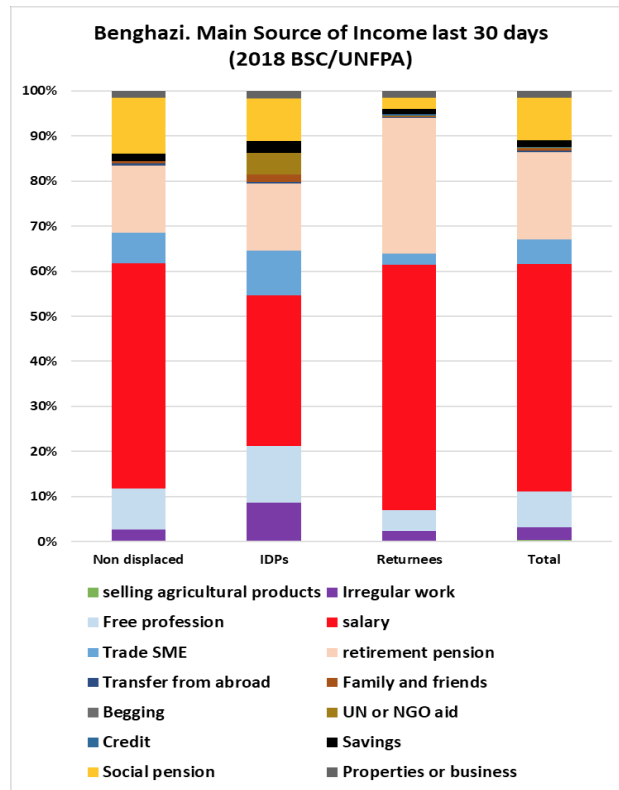
Al Shahid (2018) argues that economic activity in the Organization of the Petroleum Exporting Countries (OPEC) member state Libya is dominated by the oil and gas sector which accounts for 60% of its GDP. The natural resource represents almost 82% of the county's export earnings (Al Shahid 2018).

According to Giaber (2015), all successful cities are built on an economical industrial bases and within a comprehensive Master Plan that includes economical and physical aspects locally, regionally and nationally. However, and in the case of a city like Benghazi, which is built mainly on a single type of industry (oil), these kind of cities are not as successful (Giaber 2015).

According to the European Union report of the city profile of Benghazi (2018), says the city is characterized by its important trade and transportation sector. The city in fact is a major historical port of Libya. These sectors however suffered from closing during the war of 2014. Also, through time, the ports of Benghazi have been suffering from the lack of maintenance and poor management. Therefore, the focus of the income of local people is mainly salaries from the public sector (European Union 2018).

The following figure 4.9 illustrates the distribution of the income of the city which is mainly focused on salaries earned from public sector. The figure shows that there is a heavy dependency on public sector salary as a source of income to the city.

**FIGURE 4.9 THE DISTRIBUTION OF INCOME OF THE CITY OF BENGHAZI**



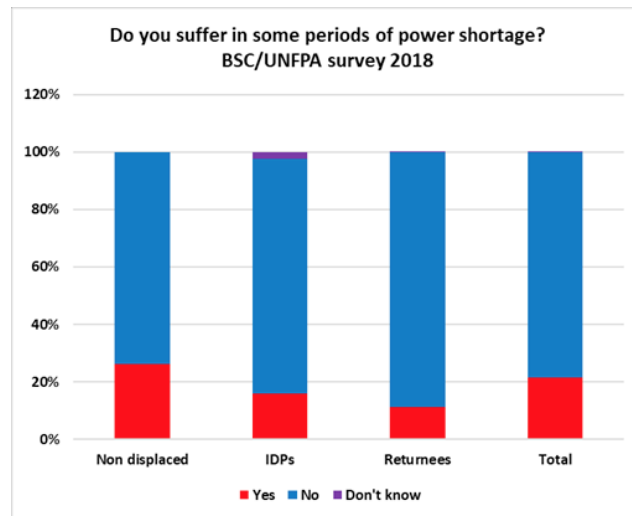
**SOURCE: (EUROPEAN UNION 2018)**

According to the European Union report of the city profile of Benghazi (2018), after the last war which took place in 2014, many facilities in the city have been affected including the electricity power plant (European Union 2018).

Also, the electricity main power plant of the eastern side of Libya is based in Kuwaifyah (area in Benghazi) is connected to a national grid through a 400 KV network, and the distribution within the municipality of Benghazi is approximately 220 KV (European Union 2018). In March 2018, the UN Habitat reported a clear serious damage on the electricity network due to the conflict that took place in the city (European Union 2018).

Therefore, the city of Benghazi is suffering from a serious power outage. The following figure 4.10 illustrates a survey of people’s opinions within the municipality of Benghazi regarding electricity distribution:

**FIGURE 4.10 PEOPLE’S OPINIONS WITHIN THE MUNICIPALITY OF BENGHAZI REGARDING ELECTRICITY DISTRIBUTUION**



**SOURCE: (EUROPEAN UNION 2018)**

According to the figure above, the survey indicates that almost 99% of Benghazi’s population receive electricity from the general grid of the city. However, almost 20% of households complain about a power shortage which indicates that the situation can be worse due to the expanding of urbanization in the city (European Union 2018).

In addition to that, a main factor for a development planning in general, and sustainability development in particular is the availability of data. The availability of Data for Sustainable Development is important to transform the way governments, citizens, and companies do business (Open data watch 2018).

Furthermore, the United Nations sustainability development goals (UNSDG’s) centre provides a platform of the Global SDG Indicators Database. This platform provides access to data compiled through the UN System in preparation for the Secretary-General's annual report on "Progress towards the Sustainable Development Goals" (United Nation 2019).

In the same manner, (Open data watch 2018) argues that the availability of good and well-used data can make a difference in people’s lives including:

- Informing government policies and providing evidence of their success or failure.
- Good available data, is important to businesses and individuals who use the information to make daily decisions that affect their well-being (Open data watch 2018).

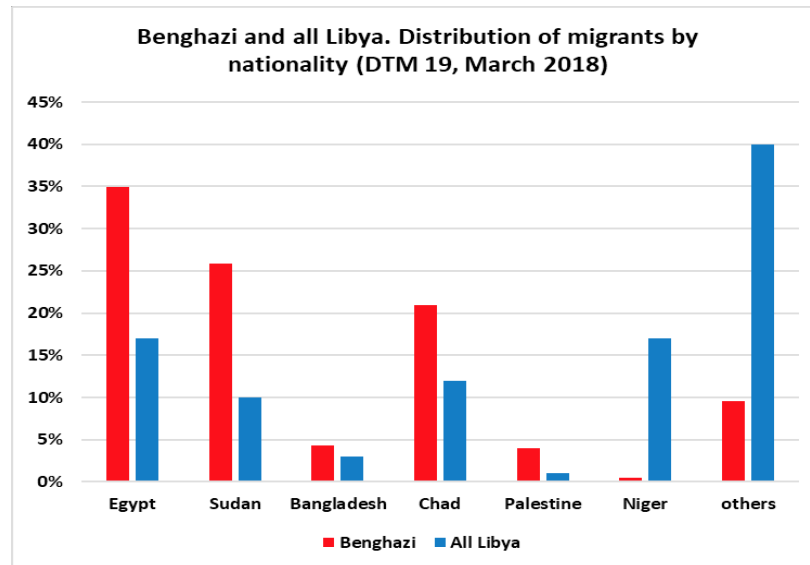
In the case of Benghazi, according to the European Union report (2018), in 2006 the municipality of the city hosted about 84% of the governorate population within its old limit. By considering the new boundaries and districts, the data of censuses by the district would give a total population for the (new) municipality at only 447,744 and 522,95016 respectively for 1995 and 2006. However, the data for several areas of the municipality were not available including some compactly areas such as Laithy (European Union 2018).

In addition to that, a survey was conducted in 2012 by the European Union report (2018) in the city of Benghazi, aiming to estimate the number of population of migrants to the city. The results showed that about 2/3 of Benghazi migrants have left the country due to the events of 2011 (European Union 2018).

Most of these migrants are from African nations including 88% from Egypt and Chad. Most of these migrants are seeking to cross to Europe meaning that Benghazi is only a step for migrants before going to other regions (European Union 2018).

According to the distribution of migrants by nationality, it can be confirmed that almost all migrants are workers. The following figure 4.11 illustrates the distribution of migrants in the city of Benghazi based on nationality (European Union 2018).

**FIGURE 4.11 THE DISTRIBUTION OF MIGRANTS IN THE CITY OF BENGHAZI BASED ON NATIONALITY**



**SOURCE: (EUROPEAN UNION 2018)**

#### **4.6 INSTITUTIONS CHARACTERISTICS:**

According to the Business anti-corruption portal (2016) there is corruption in Libya within all sectors which has been a major concern. According to Business anti-corruption portal (2016) corruption presents a significant difficulty for companies doing business in Libya. All sectors in the Libyan economy suffer from widespread corruption; however, the public procurement sector and the oil industry are among the most affected (Business anti-corruption portal 2016).

This is due to bribery and favouritism which are the core of the issue of corruption in Libya. In Libya’s public sectors in particular, briberies and favouritism are very common therefore, companies and international investors struggle with the unfair competition from the state-owned businesses (Business anti-corruption portal 2016).

In addition to that, Business anti-corruption portal (2016) argue that corruption in the Libyan institutions was widespread under Gaddafi’s rule, and after the “Arab spring” the situation just got worse. The issue of corruption within the country’s



institutions is due to the weakness of combating of corruption within the institutional framework. Also, the violence and political instability led to undermine the rule of law in the public sector in particular and other sectors in general (Business anti-corruption portal 2016).

According to the Foreign & Commonwealth Office (FCO) (2017) civilians continued to struggle from ongoing hostilities and armed groups acting with impunity as a result of the volatile political and security situation. 4 civilians killed and 18 injured by an explosion in al-Kish square (area in Benghazi). One of the civilians was Muhammad Bugaighis, who was an anti-corruption activist (Foreign & Commonwealth Office 2017).

In addition to that, sustainability in general has an impact on many key sectors, including energy sector, agricultural sector, fisheries and industrial products as well as the market of services which is depending mostly on telecommunications. (European Commission 2009).

Consequently, the problem of electricity and power would lead to other problems such as telecommunication cut. According to Kemp (2016), a workshop of researchers, civil society, business, and government was held at Lancaster University on 9 March 2016 bringing together responses from all who have been affected by the loss of supply from the flooding that took place in 2015 in North Lancashire. The most significant effects of the loss of electricity was the loss of internet and telecommunication connections (Kemp 2016).

Telecommunication systems plays an important role in terms of enhancing businesses in both developing and developed nations. In the case of Libya, the European Commission report of (2009) argues that the telecommunication sector has expanded dramatically since 1990s, however still privatization of the state monopoly is not planned at the moment and foreign companies have made a major contribution for the development of a modern telecommunication networks (European Commission 2009).

According to the Chaudry (2018), during the current civil war in Libya, the country's economic and telecommunication sector like many other sectors in Libya has been divided. The institutions are divided between two governments and facing the challenge of misappropriation including telecommunications sector (Chaudry 2018).

Chaudry (2018) argues that although, the telecommunications sector is facing the challenge of the government monopoly, there is a glimmer of hope in the drafting of new telecommunications law. The government in Tripoli currently is in the stage of developing an independent regulatory authority, which would allow other telecoms operators to compete with the government. On the other hand, due to the limited infrastructure, chances are fairly weak to fiber deployments in urban areas (Chaudry 2018).

Furthermore, Libya in general is also facing the issue of postal and post codes services. According to Elgadi et al. (2016), a study of selecting sustainability development of residential neighbourhoods in Tripoli (Capital of Libya), one of the institutions indicators was the proportion of people who use the postal mail service. This indicates that there is a lack of postal coding across the country (Elgadi et al. 2016).

On the other hand, Zaptia (2019) argues that the Libyan General Authority for Telecommunications and Informatics (GATI) has granted permission to Libya Post (Libya's public postal services company) to begin the completion of Libya's Post /Zip Code address project, Libya Post reports. This includes, building applications for the database management of the project, developing a public businesses platform to access postal code services, internet applications and other services required by Libya Mail (Zaptia 2019).

According to the World Bank report entitled country engagement note for Libya (2019), since the 2011 uprising, the Central Bank of Libya (CBL) has been struggling to achieve its core responsibilities including managing currency, money supply and interest rates, and overseeing commercial banking (World Bank 2019). Also, the financial sector in Libya in general, is suffering from

“liquidity crisis”. This is due to the macroeconomic instability and loss of confidence in the banking system, which is also adversely affecting access to credit (World Bank 2019).

Moreover, according to Zway (2017), the Libyan currency (Dinar) has lost most of its value since 2014. This loss has created a large gap between the official and black market exchange rate (Zway 2017). In addition, Zway (2017), argues that the efforts at economic stabilization after the revolution were deterred by unpredictable policies, mismanagement, and corruption, as well as the lack of structural reform of the banking sector (Zway 2017). This then resulted to an inflation on the Libyan Dinar which also led to an increase on the prices of goods.

## **CASE STUDY TWO: THE CITY OF AMMAN - JORDAN:**

### **4.7 Geographical and Historical context:**

Jordan is a country located in the Middle East. The country is bordered in the northwest of Saudi Arabia, between Israel (to the west) and Iraq. Jordan has a total area of 89,342 sq km, with land boundaries of 1,744 Km and a 26 Km coastline (The World Factbook 2019). After the World War 1 and the dissolution of the Ottoman Empire, Britain was mandated by the League of Nations to govern much of the Middle East. In the early 1920s, Britain decided to demarcate a semi-autonomous region of Transjordan from Palestine (The World Factbook 2019).

After that, the area gained its independence in 1946 and became the Hashemite Kingdom of Jordan. The country then was ruled by its long-term ruler King Hussein (1953-1999) (The World Factbook 2019). Furthermore, after the death of King Hussein in 1999, the eldest son Abdallah the second, assumed the throne and became the ruler of the country till current days (The World Factbook 2019).

According to Pletche (2019), Jordan takes its name from the Jordan River which forms much of the country's Northwest border. While several theories for the origin of the river's name have been established, the river was called the Aulon

by the Greek and sometimes it is called Al- Shariah which means “watering place” by the Arabs. Jesus was baptized in its water and today the river remain a religion destination for many people (Pletche 2019).

Robins (2019) argues that, before the World War One (WW1), the potential for the emergence of a state beyond the River Jordan was almost non-existent. This was due to the lack of significant urban concentration in the region. Amman, which is the current capital of Jordan, was a deserted village until 1870s. Neither was there much sustainable prosperity in the area (Robins 2019).

On the other hand, Robins (2019) argues that, people who x in Transjordan before the WW1 had no experience of any urbanization. Since 1867, a part of the area of Transjordan had come into contact with the Ottoman state as a tax extractor, resource distributor, a provider of security and a cofounder of economic projects such as the Hijaz Railway, which linked Damascus and Medina (Robins 2019). The following figure 4.12 illustrates the map of Jordan and the location of the capital Amman.

**FIGURE 4.12 MAP OF JORDAN**



**SOURCE: (WORLDTLAS 2019)**

In addition, Khirfan (2017) says that Amman, the capital of Jordan has undergone rapid urban growth due to its internal rural and urban migration as well as external

immigration which took place by the regional political unrest and particularly the Arab-Israeli conflict (Khirfan 2017). According to Potter et al (2009) The city of Amman, has had an increase in the number of its population. Amman, expanded From hosting 9% of Jordan's population in 1952, to 40% in 2007, and the population is estimated to be over 2 million (Potter et al. 2009).

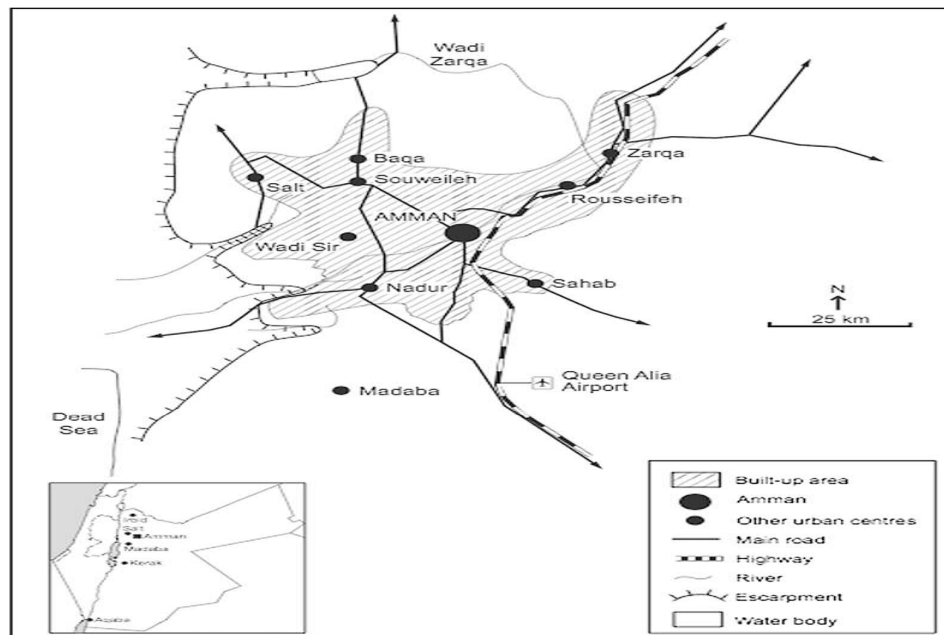
According to Potter et al (2009), Amman is categorized as an ancient city due to the Roman influence, the rapid urban growth of the city led to making the city geographically as one of the most important cities in the modern Arab world (Potter et al. 2009).

“Amman is a modern Arab city rather than a great, ancient metropolis of the Orient: It has never rivaled Damascus or Cairo as a grand Islamic city of antiquity.” (Greenway and Ham 2003: 98).

#### **4.8 ENVIRONMENTAL CHARACTERISTICS:**

According to Potter et al (2009), Amman is located on an undulating plateau, which makes up the North-west of Jordan (Potter et al. 2009). The city's original site is located on seven hills or as people of Amman call it 'Jabals'(Potter et al. 2009). The original central part of the city was at a height of between 725 and 800m. However, the expansion of the city in the past 25 years resulted in the city to be located at a total of 19 hills with an extensional height of 875m (Potter et al. 2009). This shows the fast urbanization that took place in the city Amman. The following figure 4.13 illustrated the general location of Amman.

**FIGURE 4.13 THE GENERAL LOCATION OF AMMAN**



**SOURCE: (POTTER ET AL. 2009)**

Climatically, and just like most parts of Jordan, Amman's weather is contrast between a relatively wet rainy season between November and April and the rest of the year is relatively dry (Climates to travel). Spring and autumn are quite short seasons, but locally are classified to be the most pleasant times of the year. The summer period starts from the end of May through the middle of September and it is knows as a rainless period with an average temperature of 28 C to 32 C with typically low humidity and regular breezes (Potter et al. 2009).

According to (Ghanem 2011), rainfall in Jordan is the only water source in the country. The rainy seasons start from October to May of the following year. Also, Jordan receives about 85% of its precipitation from the Mediterranean low system (Ghanem 2011).

According to Al-Jayyousi (2004), Jordan is one of the arid to semi-arid countries in the world and this fact the resulted in water shortage across the country. Due to the variable topographic features of Jordan, the distribution of rainfall varies

considerably with location (Al-Jayyousi 2004). Rainfall concentrations starts from 600 mm in the northwest of the country to less than 200 mm in the eastern and southern deserts, which shape about 91% of the surface area of Jordan (Al-Jayyousi 2004). Therefore, Jordan is facing a continuing imbalance in the population-water resources, and one of the solutions illustrated by (Al-Jayyousi 2004) is the reuse of greywater (Al-Jayyousi 2004).

According to Al-Jayyousi (2004), an experiment took place in Ain El Baida which is a suburb area in Jordan. The experiment was to evaluate the benefits and costs of the reuse system and the impact of greywater reuse to ensure if that would make a change in the lives of the poor across the nation. Consequently, the results of the experiment were reasonably positive in many ways such as, improving home gardening, increase in the environmental awareness in the community and feeling more independent due to the skills gained and income earned (Al-Jayyousi 2004).

On the other hand, people have been convinced to adopt such water use pattern, but the main challenge in such process is the enhancement of the social capacity of people which includes manners and attitudes to deal with water shortage (Al-Jayyousi 2004). This then indicates that there is an issue of awareness of the importance of water resources.

“It is argued that the basic economic resource in today's knowledge society is no longer capital, natural resources, or labour, but knowledge” (Al-Jayyousi 2004).

According to Kutiel et al (1996) generally, historical observations shows a decreasing in the annual amount of precipitation in the MENA region (Kutiel et al. 1996). In addition, previous studies that have dealt with the level of precipitation over the Mediterranean region shows an expectation of a reduction in the level of rainfall of about 10-15% (Ragab and Prudhomme 2002).

On the other hand, Cohen and Stanhill (1996), argue that there are no significant change in the level of precipitation in the eastern Mediterranean region (Cohen and Stanhill, 1996) . In fact, Xoplaki et al. (2004), found that rainfall in the Mediterranean area in general increased until 1960s, however, a decrease in precipitation started since then by  $2.2 \text{ mm month}^{-1} \text{ decade}^{-1}$  (Xoplaki et al. 2004).

According to Ghanem (2011), the average level of water falling over the capital Amman is approximately  $480 \text{ mm}^3$ . However, most of this water is unavailable for human usage due to the loss of it by evaporation or being too polluted (Ghanem 2011). . This then indicates that there is a noticeable water shortage in Amman.

Ali and Al Nsairat (2009) argue that, the Agenda 21 in Johannesburg Summit 2002, shows that Jordan is highly dependent on its poor environment, ensuring that natural resources such as water, soil, plants and so on, which emphasis that it should be used in a sustainable manner. According to the Summit of 2002, this matter of sustainable usage of resources is one of the most urgent obligation to Jordan (Ali and Al Nsairat 2009).

In addition to that, Ali and Al Nsairat (2009) argue that Jordan is a developing country that is struggling with many similar problems to the globe. For example, energy and the increase in the level of pollution especially with the poor quality of resources of energy and the inefficient ways of usage (Ali and Al Nsairat 2009). According to Jaber and Probert (2001), Kerosene, diesel fuel and electricity are the main forms of energy used by households. However, about 83% of households in Jordan depends on using Kerosene for automobile and water heating (Jaber and Probert 2001). This then indicates that there are issues related to the inefficiency usage of energy sources in Jordan.

Furthermore, using that type of fuel has major impacts on people's health life such as increasing the number of people being killed each year by suffocation or suffering health problems due to the inhalation of fumes and gaseous pollutants. On the other hand, crude oil and petroleum products which make about 94% of Jordan's primary-energy sources are imported from other nations and due to that



fact, the government's energy pricing policies are not clear (Jaber and Probert 2001).

Furthermore, in the last 25 years, Jordan has been practicing construction projects in a shifted way towards modern (Western) building systems, to cope with international modernization life style (Ali and Al Nsairat 2009). For example, the Al-Abdali district development project has taken on the responsibility to implement various policies and initiatives in all departments and divisions to protect the environment including grey water treatment, energy efficiency and supporting developers to achieve the (Leadership in Energy and Environmental Design) LEED certification which confirms that a building project is environmentally responsible (ABDALI 2012).

According to Al-Khashman (2007), Amman is the commercial, industrial and administrative centre of Jordan. Therefore, the city is crowded with vehicles and most of these vehicles in are fairly old, 1990s or even older, and they operate by leaded gasoline with ratio of 0.11g/l and 0.17g/l for super gasoline (Al-Khashman 2007). This then resulted in effecting the quality of air in Amman, due to the high level of road traffic and industrial activities (Al-Khashman 2007).

In addition, Al-Khashman (2007) argues that, in 2004, a total of 120 samples of street dust in Amman were collected in a stable weather conditions in a hot dry season between August and September. The samples were collected from the edges of pavement in the streets of Amman using a plastic dustpan and brushes. About 100g of dust was stored in small self-sealing bags and then analyzed in special labs (Al-Khashman 2007).

The results of analyzing these samples showed that the dust in the streets of Amman contain a high percentage of metals including, Fe (Iron), Cu (Copper), Cd (Cadmium), Pb (Lead), Ni (Nickel) and Zn (Zinc) (Al-Khashman 2007). This indicates an issue of air pollution in the city of Amman due to the inefficient type of fuel and cars used in across the city.

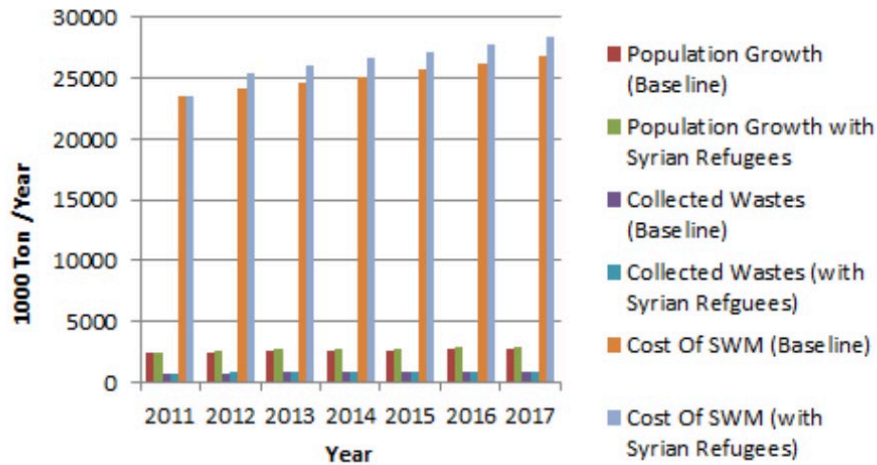
Furthermore, Aljaradin and Persson (2014) argues that the past 15 years the volume of waste and its composition in Amman has increased. This has resulted in becoming one of the major environmental issues in Jordan generally and Amman particularly (Aljaradin and Persson 2014). According to Aljaradin and Persson (2014), Solid Waste Management (SWM) challenges in Amman are numerous. These includes, financial support, lack of suitable equipment as well as limited availability of trained manpower and the sudden increase in the number of population that is due to the several waves of migration from some of the neighbouring countries (Aljaradin and Persson 2014).

In the same manner, Aldayyat et al. (2019) argues that Jordan has no comprehensive system for solid waste collection, recycling, disposal, and treatment. There are numerous challenges brought to the sector by the increase of the rate of the population through the regional migration that have and still affect the SWM sector (Aldayyat et al. 2019).

On the other hand, Aldayyat et al (2019) argues that there are different procedures that can assist to reduce the impact of migration from Syria. For example, the legalization and awareness activation can be a key solution for the issue of SWM at the refugee's camp sites. Also, the private sector has the ability to play a principal role in the SWM and economic problems in Jordan (Aldayyat et al. 2019).

In addition to that, 1900 tons of wastes are collected daily from 20,000 bins by 231 Trucks in the capital Amman. All of the waste collected is being transported and disposed at Al- Ghabawi landfill sanitary which is the biggest and only engineered sanitary in Jordan. About 73% of the collected solids which are received in Al-Ghabawi landfill sanitary is delivered through one station (Aldayyat et al. 2019). Figure 4.14 shows the development of the increase of the population by Syrian refugees in Amman and the impact of it on Amman's (SWM) sector in the period between 2011-2017 (Aldayyat et al. 2019).

**FIGURE 4.14 THE COST OF (SWM) IN AMMAN**



**SOURCE: (ALDAYYAT ET AL. 2019)**

The figure above shows that there is a sharp increase in the amount of SWM cost between 2011 and 2017. On the other hand, the amount of SWM with the inclusion of Syrian refugees is even higher which then indicates the issue of waste management in the city of Amman.

#### **4.9 SOCIAL CHARACTERISTICS:**

According to Abu-Hamdi (2016) throughout king Hussein's reign, he had been working on ensuring the autonomy of Jordan and the security of Hashemite monarchy. King Hussein dismantled the established systems of tribalism in Jordan and the key to do that was by creating a bureaucratic system. For example, the Greater Amman Municipality (GAM) has limited the reach of the tribes and their elite by breaking up the village councils, which had in the past controlled the development process in and around Amman (Abu-Hamdi 2016).

According to Beauregard and Marpillero-Colomina (2011) the sudden increase in the number of refugees and migrants led the city of Amman to be affected in order to create a development master plan. In 2006, the Greater Amman Municipality (GMA), replaced the old development plan of the city and largely ignored the 1987 Greater Amman Comprehensive Development Plan (GACDP) (Beauregard and Marpillero-Colomina 2011).

Abu-Hamdi (2016) argue that the (GAM) and the Greater Amman Comprehensive Development Plan (GACDP) were both trapped by the 1989 financial crisis of Jordan. In addition, the budget difficulty and the inability to borrow have forced Jordan to receive aids from the international monetary funds. This action disabled the internal welfare of the country and froze the development process of the government (Abu-Hamdi 2016).

Also, during the period of 1970s and 1980s, Jordan had received funds from the neighbouring Gulf states. These funds are estimated to be between \$550 million and \$1.3 billion as a direct fund. On the other hand, the amount of fund decreased to \$393 million in 1990 and \$164 million in 1991 (Abu-Hamdi 2016).

Even though, Jordan had to repay the international agencies for the fund that was provided to the country, the Jordanian citizens were, however, less concerned about the need to repay the national dept than the state's required austerity and the effects of it (Abu-Hamdi 2016).

According to Beauregard and Marpillero-Colomina (2011) the 1987 development plan was the second master plan after the plan of 1954-1955 and the roadway plan in 1938 which was done by Andrea Park Mitchell, a British military officer hired by then British appointed mayor of Amman. In addition to that, since 1980s Amman had doubled in population to over 2.2 million people. And the city had tripled its area from 532 sq Km to 1662 sq Km (Beauregard and Marpillero-Colomina 2011).

During those years and until present days, Amman has experienced receiving a large number of refugees and migrants due to the violence that is taking place in the Middle East. For example, in 2008, Jordan had 50,0400 refugees which made the country to be the fifth-largest refugee-hosting country in the world (Beauregard and Marpillero-Colomina 2011).

As a result of the sudden increase in the number of the population, Amman was facing challenges of increasing expenditure in order to extend services and infrastructure into low-density areas which made the (GMA) change its master

plan. Furthermore, the rapid growth and the under-developed transportation system have rapidly increased the number of automobiles ownership. Rapid growth also created extra pressure on the country's fragile water supply (Beauregard and Marpillero-Colomina 2011).

In addition to that, Jamrah et al (2006) argues that noise pollution is a substantial environmental problem in many urban areas and particularly developing nations (evaluation traffic noise 2005). Even though, noise pollution situation in the Greater Municipality of Amman (GMA), Jordan is similar to many situations in other nations, accurate traffic noise data and information in Amman are very rare (Jamrah et al. 2006).

On the other hand, Masten and Davis (2012) argues that there are three significant reasons as to why international recognition of noise pollution issue has not appeared in a similar way as have both air and water pollution problems. These reasons are summarized as subjective experience, short decay time, and difficulty to link cause with effect when it comes to health influences (Masten and Davis 2012).

According to Jamrah et al (2006) the following formula was implemented in the city of Amman by Evaluation traffic noise in 2005 to evaluate traffic noise level during day and night times.

$$(\text{Traffic Noise Index}) \text{ TNI} = 4 \times (L^{10} - L^{90}) + (L^{90} - 30).$$

Where: TNI is the traffic noise index.

( $L^{10}$ ) is the statistical noise level.

( $L^{90}$ ) is the results of background noise level (Jamrah et al. 2006).

After implementing the formula in 28 locations in Amman, results show that during the day-time statistical noises level in Amman are similar to those reported for other cities around the world. Also, the night-time statistical noise level shows that, these noise levels are very much higher than the levels reported in living rooms and bedrooms even during the night-time, resulting in more possible sleep

disturbance due to traffic noise which indicates that there is an issue of noise pollution in the city of Amman (Jamrah et al. 2006).

Furthermore, Abu-Ghazalah (2008) argues that as in many urban places in the world, Amman is facing a demand in housing projects. According to Abu-Ghazalah (2008), housing projects in Jordan are divided into two main groups: The first is built by the public sector, which constitutes only 10.36% and the second group of housing is built by the private sector that constitutes 89.64% of the housing schemes (Abu-Ghazalah 2008).

In addition to that Abu-Ghazalah (2008), argues that the problem of housing projects in Amman is not only the high demand of housing, but it is also about the changes and the adds that transform the architectural, characteristics without paying much attention to other social and behavioural factors. In Amman, the concept of housing projects in its original design, is not followed at all. This issue is all over Amman where the concept of the project is neglected and changes in its architectural appearance after building it took place (Abu-Ghazalah 2008). This indicates issues such as weak public institutions and rule of law.

According to Abu-Ghazalah (2008), neighbourhood projects do not follow the original planning theory in its first concept design which cause the main problem of wayfinding in housing schemes. This is due to the following reasons:

1. The absence of a clear street network planning.
2. The various widths of streets that do not match the size of the projects.
3. The missing and undistinguished boundaries.
4. The lack of open space and the absence of playgrounds for children.
5. The absence of a civic centre for public use.
6. The absence of building regulations which would lead to changing the appearance of projects and their architectural.
7. The large number of public buildings constructed near housing projects (Abu-Ghazalah 2008).

Abu-Hamdi (2016) argues that the most known problems of the development of Amman have long been nepotism and the “Wasta” or favor-system. those two problems gave the ability to individuals who have the social and political power to track their personal interests regardless of their proposals (Abu-Hamdi 2016).

#### **4.10 ECONOMIC CHARACTERISTICS:**

According to the world bank data for GDP per capita in Jordan 2019, the population in Jordan increased from 5,122,493 million in 2000, to 9,956,011 million in 2018. Although, the number of populations increased, there has been a major decreased in the ratio of poverty (World Bank 2019). Figures from the World Bank 2019 illustrated that the ratio of poverty in Jordan decreased from 1.6% in 2000 to 0.1% in 2010 (World Bank 2019).

On the other hand, according to the Middle East Monitor (MEM) (2019), the Jordanian government established a survey study conducting that almost 15.7% of people in Jordan live in extreme poverty (Middle East Monitor 2019). In addition to that, a press conference that was conducted by the Prime Minister Omar Al-Razzaz stating that “the poverty rate was at 14.4 % in 2010, up from 13.3 % in 2008. Unofficial estimates place the poverty rate at 20 % in 2016” (Middle East Monitor 2019).

In the same manner, Potter (2017) argues that, Jordan’s poverty rate has increased in recent years, due to the high unemployment rate and weak economic growth. In addition, job growth in particular is a major challenge in the area of the Middle East, as in 2016, unemployment was at 15.3 percent (Potter 2017). Potter (2017) also argues that the increase in the number of Syrian refugees in Jordan, has put a strain on the country’s economy. Also, the ongoing Syrian crisis resulted in closing the export routes to Iraq and Syria, which has impacted the country’s state of minimal growth (Potter 2017).

Moreover, during the last 30 years, Jordan has experienced major change in many sectors including, infrastructure, housing, urbanization, commerce, agriculture and industry. Due to this change, many problems appeared such as unemployment, increased poverty rate, growth in the percentage of the population moving from rural to urban areas and increase in energy consumption (Jaber and Probert 2001).

Jaber and Probert (2001), argue that fuel pricing policies must include clarifying the best-selling-price for a product. This includes the cost of importing the crude-oil, external costs such as road usage for transportation and pollution resulting from the usage of the fuel (Jaber and Probert 2001).

In addition to that, tax rates should be fixed for each type of fuel so that revenues for each product can be predicted easily. This transparent pricing policy would benefit both economic and national interests for the country (Jaber and Probert 2001).

According to the Census and Economic Information Centre CEIC (2018), Jordan's GDP Per Capita reached 4,102.324 USD in December 2018, compared with 4,055.144 USD in Dec 2017 (CEIC 2018). On the other hand, the Trading Economics (2018) argues that, Jordan's Gross Domestic Product per capita last recorded at 3236.90 US dollars in 2018 (Trading Economics 2018b). Furthermore, the The World Bank data on GDP Per Capita for Jordan (2019), argues that Jordan's GDP Per Capita reached 9,347.942 USD in the year 2018 (The World Bank 2019).

Jaber and Probert (2001) argue that in terms of unit-electricity price, the government had established a uniform national electricity-tariff in 1984. The Jordanian government goals of applying such tariff, are to reduce the administrative cost and complexity that the non-uniform tariff consumers go through. Also, this tariff would provide equity to the public and reduces the inducement of population moving to urban areas (Jaber and Probert 2001). On the other hand, the Jordanian government is pushing towards reducing



urbanization by encouraging greater consumption and discouraging the achievement of higher efficiency (Jaber and Probert 2001).

However, Jaber and Probert (2001) argue that, it is much better for the government in Jordan to provide direct assistances to low-income consumers rather than supporting the whole of community. This is due to the inability of those consumers to pay the original price of electricity (Jaber and Probert 2001).

In addition to that, observing that there were differences in the numbers of the GDP Per Capita in Jordan. This could illustrate that there is a problem with the availability of accurate data in Jordan. For example, Thompson (2018) argues that, there are a lack of accurate data on disability prevalence in Jordan. The data available is limited for various reasons, including cultural and technical as well as society's view of disability and data collection methodology (Thompson 2018).

According to the Business and Human rights Resource Centre (BHRRC)(2017), Jordan lacks an accurate and complete database on issues such as, work-related injuries, accidents, and diseases. The only sort of data available is the data covered by occupational insurance, and that only make up approximately half of the national labour force (Business and Human rights Resource Centre 2017).

Furthermore, Findlay and Samha (1985) argue that, the international transfer of workers, capital and technology continues to be an important aspect of understanding the structure of cities. Although, many studies and have been investigating the impact of international geographical and economic movement in Amman. The lack of obtaining appropriate data on migrant expenditure and money transfer is still a challenge in the city of Amman (Findlay and Samha 1985).

According to Findlay and Samha (1985) international migration has had an impact on urban growth in the city of Amman, but that is not the only impact that Amman has had. One of the consequences of international migration is the effect on the urban economy of the city (Findlay and Samha 1985).

Saket (1983) has clearly illustrated that migrant families have a higher level of ownership of electrical devices per household than any other group in Amman (Saket 1983: 20). Although, considering the idea of migrant families having a lower household budget than non-migrant families, (Saket 1983: 20) argues that migrant families in Amman spend more on housing, food, and clothes than local citizens (Saket 1983: 20).

According to the Corporate finance institute (2019), banks in Jordan are the strongest segment of the country's financial services industry. Studies shows that in 2015, almost 18.82% of the country's GDP was accounted from banking services. Therefore, banking services in Jordan is considered to be one of its largest economic sectors (Corporate finance institute 2019).

In the same manner the Word Bank report regarding measures of business regulations and their enforcement in Jordan (2020) shows that the procedure to open a business bank account in Jordan takes one day. This includes completing application for company registration, proof of 50% capital deposit from the bank and copy of the entrepreneur's ID card (Word Bank 2020).

#### **4.11 INSTITUTIONAL CHARACTERISTICS:**

As a general look, Awadallah (2015) argues that, Jordan must seem to the rest of the world like a welcome refuge from the violence engulfing many of the countries around it. But if we dig a little deeper at the surface, we will find a country and a government that are facing major, even unprecedented challenges from every side (Awadallah, 2015).

Also, Awadallah (2015) argues that Jordan's resilience speaks volumes about the country's leadership and its people. However, when it comes to reality, regional instability and continued domestic pressures on the government mean the country has serious weaknesses and vulnerabilities in its institutions (Awadallah 2015).

Al-Fares (2011) argues that the relationship between the incentive methods employed in four public institutions is a strong method that strengthens the relationship between the incentives and loyalty towards the organization which, as a result, affects the performance at work in public institutions (Al-Fares 2011).

In the same manner, Alfandi and Alkawsaneh (2014) examined the level of job satisfaction for employees at the United Nations Relief and Works Agency (UNRWA) in Amman. The research tried to clarify the most effective factors that support achieving job satisfaction and effective performance. In addition, the research found that the percentage of job satisfaction was clearly low with only 58.82%. The research also illustrated that there are several factors and variables affecting the level of satisfaction between employees, such as salary, age, level of experience, marital status, and place of residence (Alfandi and Alkawsaneh 2014).

According to the Prieto (2017), working conditions in Jordan are still poor. Although Jordan was the first Arab country to sign an International Labour Organization (ILO) agreement to implement better working conditions, Amal Abu-Jiries, (program manager at Friedrich Ebert Foundation, FES) argues that, as long as the law itself keeps on denying the agreement, Jordan cannot reach decent working conditions.

“We need to improve the law in order to enforce social protection, assuring social security and a minimum monthly salary” she said (Prieto 2017).

According to El Said and McDonald (2002), the institutions in Jordan have two major problems, lack of skilled labour and poor logistical systems. Although, corruption and insufficiencies in legal and taxation systems in the literature are usually defined as a major institutional failing, however in the case of Jordan “Wasta” and tribal mentality are serious issues in the structure of institutions (El Said and McDonald 2002).

According to Transparency international (2018), the international rank of public sector corruption in Jordan declined from 53 in 2015 to 48 in 2018 (Transparency

international 2018). In addition to that, Trading Economics illustrates the following 4.15 showing corruption rank in Jordan from 1996 until 2018 (Trading Economics 2018).

**FIGURE 4.15 CORRUPTION RANK IN JORDAN 1996 - 2018**



**SOURCE: (TRADING ECONOMICS 2018)**

According to Beauregard and Marpillero-Colomina (2011), Amman’s 2025 master plan is not only a plan to establish long-term guidance for development but also to upgrade the municipal government. GAM had been working with BearingPoint and the World Bank to review and restructure its various activities.

Also, the plan is to reinforce land-use regulations, a more systematic approach to infrastructure, and greater sensitivity to the cultural heritage and social diversity which would require a local government with greater capacity for high-level professional work and the ability to deliver services to citizens efficiently and effectively (Beauregard and Marpillero-Colomina 2011).

#### **4.12 SUMMARY:**

The information illustrated in this chapter provides a general view of the situation in Libya and Jordan and the cities Benghazi of Amman in particular. The literature shows geographical, historical, environmental, economic social and institutional context of the city of Benghazi as well as presenting the current post-conflicts issues of Libya in general and Benghazi in particular from a documentary source.

In addition, the literature shows evidence about issues and challenges in Jordan from different aspects including geographical and historical, environmental characteristics, social characteristics, economic characteristics and institutional characteristics. Also, the following chapter will assess sustainability issues in the cities of Benghazi and Amman through examining sustainability indicators which will be developed based on the problems conducted from semi-structured interview and focus-group discussions.

These interviews and discussions will be conducted with citizens in both cities from all sectors. Furthermore, the next chapter will present the 5 steps of the conceptual framework (ALISA) which is used for this research. These are, clarification of issues and problems of both cities (Benghazi and Amman), objective formation, indicator preparation, indicator selecting and indicator ranking which will be conducted by cooperating with the local people.

## CHAPTER 5

### IMPLEMENTATION OF THE PROPOSED ALISA METHODOLOGICAL FRAMEWORK FOR THE CITY OF BENGHAZI, LIBYA.

#### 5.1 INTRODUCTION:

As explained in chapter 3, section 3.4 the use of ALISA methodology has to be implemented in both cases (Benghazi, Amman). To achieve the objective of indicators ranking at a local level, a case study is presented in this chapter to highlight the benefits of the ALISA method to develop sustainability indicators at an institutional and local level in a post-conflict city of (Benghazi).

The implementation of the ALISA framework includes step 1 which is clarification of issues and problems for the case study using documentary sources, focus group discussions and interviews with institutional participants in the city of Benghazi. The second step involves the objective formation by analyzing the issues and boundaries. After that, the next two steps include the formulation of indicators list. And then finally the indicators list will be presented to the locals to select and rank.

The main aim of this chapter is to achieve the following:

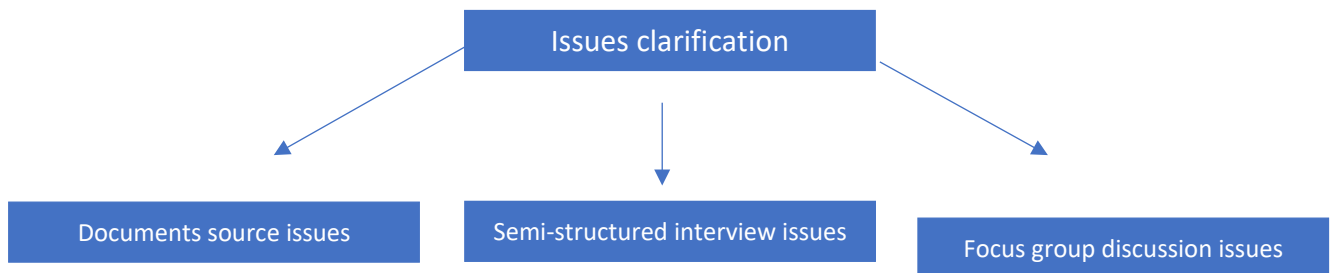
- To evaluate the framework by implementing it in a case study (post-conflict city of Benghazi).

- To test the feasibility of the framework used real-life case study.

- To clarify the limitation of the framework after evaluating the local level sustainability.

## 5.2 THE FIRST STEP (ISSUES CLARIFICATION):

The first step of the ALISA methodological framework is to develop a list of problems and issues that are facing the aimed case study. Figure 5.1 illustrates the process of the first step of ALISA methodological framework:



**FIGURE 5.1: THE FIRST STEP OF ALISA METHODOLOGICAL FRAMEWORK (RESEARCHER)**

According to Patton and Cochran (2002), there are multi-techniques to develop data in a case study. These techniques include individual interviews, group discussion interviews, observations and reports and other written data (Patton and Cochran, 2002). To use multiple sources of data for gathering information, triangulation is one of the successful methods to ensure that there is an alternative explanation and to validate the key observations (Stake, 1995 P:53).

In the case study of Benghazi, triangulation of data sources is used to gather information regarding the main issues and challenges of the city of Benghazi. Data is collected from three main sources including documentary source, semi-structured interviews and group discussions. This data is translated and transcribed and analyzed based on the following four indexes: social, economic, environmental and institutional. These four indexes are selected based on the UNCSD 2001 theme indicator framework which was adopted for the ALISA methodological framework.

The concept of using the UNCSD list is based on the interaction between the four key factors and the fact that the set of indicators are interrelated. Moreover, each set of results is grouped in tables and classified based on the four key factors (social, economic, environment and institutions).

The following table 5.1 illustrate the UNSCD 2001 theme indicator framework which was adopted to use for the ALISA methodological framework:

**TABLE 5.1, THE UNITED NATION CENTRE FOR SUSTAINABLE DEVELOPMENT (UNCSD 2001) INDICATORS:**

<b>SUB-index</b>	<b>Indicator</b>	<b>Indicator description</b>
<b>Social.</b>	Education	Literacy rate. Education level.
<b>Social.</b>	Health	Mortality. Nutritional Status. Sanitation. Drinking water. Health care delivery.
<b>Social.</b>	Equity	Gender equality. Poverty.
<b>Social.</b>	Population	Population change.
<b>Social.</b>	Housing	Living conditions.
<b>Social.</b>	Security	Crime.
<b>Environment.</b>	Atmosphere	Climate change. Ozone layer depletion. Air quality.
<b>Environment.</b>	Land	Agriculture. Forests. Desertification. Urbanisation.
<b>Environment.</b>	Oceans, sea and coasts.	Coastal zone. Fisheries.



<b>Environment.</b>	Freshwater	Water quantity. Water quality.
<b>Environment.</b>	Biodiversity	Ecosystem. Species.
<b>Economic.</b>	Economic structure.	Economic performance. Trade. Financial status.
<b>Economic.</b>	Consumption and production patterns.	Material consumption. Energy use. Waste generation and management. Transportation.
<b>Institutional.</b>	Institutional framework.	Strategic implementation of SD. International cooperation.
<b>Institutional.</b>	Institutional capacity.	Information access. Communication infrastructure. Science and technology. Disaster preparation and response.

**SOURCE: UNITED NATION COMMISSION ON SUSTAINABLE DEVELOPMENT (UNCSD)**

### **5.2.1 LITERATURE AND DOCUMENTARY SOURCES:**

In this section, information related to sustainability indicators in Libya and in Benghazi in particular was gathered through searching in literature and documents. The general information regarding sustainability indicators can be found in chapter 2. Also, literature regarding issues and sustainability in Libya and Benghazi in particular is located in chapter 4 (city profile). This information includes identifying the main issues in the city of Benghazi.

In addition to that, data that was gathered from documentary sources was a useful step to use as a starting point of the process of generating sustainability indicators. These sources included: books, newspapers and journal articles such as (Hanafiah and Yaacob, M, W, 2017, Misrati, A, 1983, Alhodairi, A, 2012). Also, government and non-government organisations, local records, economic studies report and international organisational reports such as the United Nations and the World Bank.

Some of the documents that were explored to gather data for the case study are local reports and local newspapers, and in spite of the possibility of the lack of accuracy and confidentiality, these reports were useful and important to the study. Based on the concept of the UNCSD (2001) sustainability indicators, the table 5.2 shows results of analysing documentary sources for the case of Benghazi. Clarification and listing of social, economic, environment and institutional issues in the city of Benghazi classified through literature and documents:

**TABLE 5.2 THE RESULTS OF ANALYZING DOCUMENTARY SOURCES –  
BENGHAZI**

<b>SOCIAL CHALLENGES</b>	<b>ECONOMIC CHALLENGES</b>	<b>ENVIRONMENTAL CHALLENGES</b>	<b>INSTITUTIONAL CHALLENGES</b>
Lack of proper sewerage network.	Lack of efficient transportation system (roads, bridges)	Increase of violations against agricultural projects.	Lack of reliable communication system.
Lack of reliable sanitation system.	Lack of efficient ports.	Lack of government support for agricultural projects.	Spreading of corruption.
Future vision for alternative sources of water.	lack of control over the ownership of cars.	Absence of awareness of the importance of green spaces.	Lack of postal mail services.
Inefficient waste collection system.	Lack of control over the CO2 emission.	Absence of awareness of the danger of desertification.	Lack of connections between organizations.
Inefficient control over spreading of slums.	Lack of proper public transportation.	Lack of equivalent distribution of Population across the country.	Centralized government rather than decentralized.
Increase of unemployment rate.	Lack of future plans for alternative choices of fuels.	Increase of percentage of total population living in coastal areas.	Inefficiency of telecommunication systems.
Lack of efficient health care.	Lack of efficient electrical power sources.	Lack of updating water networks.	Lack of modern banking systems.
Lack of security.	Lack of alternative sources of income.	Lack of surrounding the city by green spaces.	Lack of administrative monitoring.
Increase of crime.	Lack of training manpower.	Misuse of agricultural land.	
Shortage in medical supplies.		Increase of salinity land.	
Increase of local poverty.		The absence of the environmental monitoring process for air pollution.	
Increase in the number of unmarried women and men.		Lack of support for requirements of agricultural products.	
Lack of affordable houses.		Increase of air pollution by gases emitted especially from cars.	
Lack of control over spreading guns.		Lack of drainage networks in most areas.	
Control over the areas of informal settlements.			
Lack of availability of basic needs such as water and electricity in some areas.			

**SOURCE: AUTHOR 2019**

### **5.2.2 SEMI-STRUCTURED INTERVIEWS:**

The semi-structured interviews used in this research were conducted to achieve the followings:

- To receive answers and views from the interviewees and search about issues in-depth.
- To have an opinion and ideas about the issues related to sustainability and smartness in Benghazi from decision makers sources.
- To receive more accurate and recent information about the issues of Benghazi from main stakeholders.

The interviews have been conducted before attending focus-group discussions and surveys. This step enabled the research to have a starting point from the top of the pyramid of the city.

In other words, by making sure that interviews would include people such as lecturers at the University of Benghazi, decision makers, people working in the governments, politicians, consultants and the United Nations representative. This step then would help to understand and explore the issues of the city of Benghazi from the people who are working in the city's institutions "elite people".

### **PILOT STUDY OF THE SEMI-STRUCTURED INTERVIEWS:**

According to Teijlingen (2001), the term pilot study refers to a full-scale study or as some call it (feasibility study). It is a pre-testing study of a specific research such as a survey, questionnaire or interviews. Conducting a pilot study doesn't guarantee that the main study will be successful, however it does improve the likelihood and the skills of the researcher (Teijlingen, 2001).

As a result, a pilot study was conducted on February 2019 with three academic people. The pilot study resulted in some issues regarding the interviews. These included the confidence of the process of interviewing and some improvements on how to get into more details with the interviewee.

These recommendations were taken into consideration and as a result of the pilot study I was able to achieve the following points:

1. Developing the skills and confidence of interviewing.
2. Designing the research procedure and priorities the importance of interviewees.
3. Understanding the level of importance of the questions.
4. Estimating responses and answers
5. Developing skills of how to react to answers.
6. Identify the needs of additional explanation of any unclear points.

### **PROCESS OF SELECTING THE INTERVIEWEES:**

Selecting of the interviewees in this research was conducted through two methods:

- Previously contacting some participants such as lecturers at Benghazi university by email.
- Recommendations by using snowballing technique.

Snowballing is a technique that is used when planning to select participants to be involved in some kind of research or project. The process started by asking an already connected participant from the university of Benghazi for suggestions of who else could be contacted to participate in the research. This technique is useful in terms of securing the accurate participants to cooperate with the research by being recommended throughout the first participants who was contacted in Benghazi university.

The accurate participants are the stakeholders who are involved in decision making in city planning in the city of Benghazi as well as those whom have experience and knowledge about sustainability. The second participant was then contacted by phone to receive his/her agreement to contribute in the research and to be interviewed. This procedure was applied to the rest of the participants. In addition, as mentioned in chapter 3 (methodology chapter), participants had

the right to withdraw joining the research by simply contacting the researcher by phone or email.

In terms of the number of interviewees, Mason (2010) argues that there are several debates regarding the number of interviewees included in a research. In common with most scholars, Mason (2010) suggested that the concept of saturation is the most important factor to consider when a decision is being made about the number of interviewees in a research (Mason, 2010).

The concept saturation here means that the point where the data collection process no longer offers any new relevant data. Another way to explain this, is when the researcher is noticing that there is no updated information being gathered from the interviewees (Charmaz, 1990: 113)

On the other hand, saturation also depends on a number of factors, and not all of them are under the control of the researcher. These include: how homogeneous or heterogeneous the population being interviewed? What are the selection criteria? How much time and money are estimated to carry out the research? What are the keys stratified (e.g., demographical, professional) that are critical and directly linked to the topic of the research? (Charmaz, 1990)

Based on this information, a selection of eight decision makers were interviewed in this research. These included: academics at the University of Benghazi, engineering and urbanization consultants at the municipality of Benghazi, economic consultant of the Libyan government, the representative of the UN in Benghazi, the chairman of El Mreisa Smart Village project in Benghazi, Chairman of the board of directors of the General Authority for Communications and Informatics and the environmental and urbanization consultant at the municipality of Benghazi.

The interviews were conducted face-to-face, and all respondents were engaged and cooperated with the research and agreed to share their views and answers to the questions. Interviews were between 9 minutes to 90 minutes depending on the participants' ability.

Before conducting any interview, the researcher allowed each interviewee some time to read and understand the main goals of the interview and also explain any points that were not clear enough. Furthermore, each interviewee had the chance to read and understand the consent form followed by full explanation from the researcher regarding confidentiality. The interviews were carried out from February to March 2019. In addition, all interviews were audio recorded as well as noting the important points and answers given by the respondents.

### **RESULTS OF THE SEMI-STRUCTURED INTERVIEWS:**

After analyzing the semi-structured interviews in this research by using NVivo software analysis approach. This approach is one of the most common data forms of analysis in qualitative research. And the results of the semi-structured interviews were classified and structured based on the key sustainability indicators that were suggested by the UNCSD (2001).

Table 5.3 shows the list of issues in the city of Benghazi which are obtained from the semi-structured interviews based on the same social, economic, environment and institutional classifications.

Clarification and listing of social, economic, environment and institutional issues in the city of Benghazi classified through semi-structured interviews:

**TABLE 5.3 LIST OF ISSUES OBTAINED FROM SEMI STRUCTURED INTERVIEWS**

<b>SOCIAL CHALLENGES</b>	<b>ECONOMIC CHALLENGES</b>	<b>ENVIRONMENTAL CHALLENGES</b>	<b>INSTITUTIONAL CHALLENGES</b>
Lack of proper sewerage network.	Lack of efficient transportation system (roads, bridges)	Increase of violations against agricultural projects.	Lack of reliable communication system.
Lack of reliable sanitation system.	Lack of efficient airports.	Lack of government support for agricultural projects.	Spreading of corruption.
Future vision for alternative sources of water.	lack of control over the ownership of cars.	Absence of awareness of the importance of green spaces.	Lack of postal mail services.
Inefficient waste collection system.	Lack of control over the CO2 emission.	Absence of awareness of the danger of desertification.	Lack of connections between organizations.
Inefficient control over spreading of slums.	Lack of proper public transportation.	Lack of equivalent distribution of Population across the country.	Centralized government rather than decentralized.
Shortage in housing projects.	Lack of available reliable data.	Increase of percentage of total population living in coastal areas.	Inefficiency of telecommunication systems.
Increase of unemployment rate.	Lack of future plans for alternative choices of fuels.	Lack of updating water networks.	Lack of modern banking systems.
Lack of efficient health care.	Absence of awareness of use of power sources.	Lack of surrounding the city by green spaces.	Lack of administrative monitoring.
Lack of privet investments in health sector.	Lack of efficient electrical power sources.	Misuse of agricultural land.	Lack of trust between governmental institutions.
lack of awareness of danger of general waste which effect general health.	Lack of alternative sources of income.	Increase of salinity land.	Lack of awareness of responsibility.
Lack of training programs for new graduates.	Poor banking service.		The impact of the political situation on the efficiency of the institutions.
Ineffective teaching technics at schools.	Lack of railways.		
The issue of brain drains.	Lack of repairing damaged parts of roads.		
Lack of efficient leisure and sport centres for youth.	No pedestrian roads crossings.		
Lack of security.			
Increase of crime.			
Shortage in medical supplies.			
Increase of local poverty.			



<p>Increase in the number of unmarried women and men.</p> <p>Lack of affordable houses.</p> <p>Lack of control over spreading guns.</p> <p>Control over the areas of informal settlements.</p> <p>Lack of availability of basic needs such as water and electricity in some areas.</p>		<p>The absence of the environmental monitoring process for air pollution.</p> <p>Lack of support for requirements of agricultural products.</p> <p>Increase of air pollution by gases emitted especially from cars.</p> <p>Lack of drainage networks in most areas.</p> <p>Weak governmental support to the environmental institutions.</p> <p>Lack of awareness of the importance of natural lakes in the city.</p> <p>Lack of governmental protection towards the natural lakes in the city.</p> <p>Increase the level of ground water in some residential areas.</p> <p>The lack of the necessary equipment to maintain green spaces and parks.</p> <p>Increase number of cars.</p>	
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**SOURCE: AUTHOR 2019**

### **5.2.3 FOCUS-GROUP DISCUSSIONS:**

The research conducted two focus-group discussions to raise the issues that should be taken into consideration in order to create a list of sustainability indicators. Each group contained five participants including the researcher. The groups also included, telecommunication engineers, general managers, HR managers and trainees. The participants of the groups were recommended by Tatweer research centre and Connect Telecommunication Company.

In addition, Tatweer research centre is a developing institution that provides the city of Benghazi in particular and Libya in general with economic diversity innovations by nurturing Libya's bright young minds, supporting entrepreneurs; and attracting international expertise and investment and also by focusing on building a Knowledge-based economy that will provide solutions for global challenges around sustainability aspects such as investing in human capital, education, health care, and clean energy. Further details about Tatweer research centre can be found in the following website ([www.tatweerresearch.org](http://www.tatweerresearch.org)).

Furthermore, connect internet company is one of the services of ION Telecom and Technology, which is one of the leading companies in Benghazi in terms of providing the Internet Wi-Fi and internet lines for businesses and individuals, as well as the quality of equipment and devices used ([www.connect.ly](http://www.connect.ly)).

Each focus-group discussion lasted approximately an hour and ten minutes. After transcription and analyzing the discussions, the following table 5.4 illustrates issues in the city of Benghazi based on the key sustainability indicators that were suggested by the UNCSD (2001).

Table 5.4 shows the list of issues in the city of Benghazi which are obtained from the focus-group discussions based on the same social, economic, environment and institutional classifications. Clarification and listing of social, economic, environment and institutional issues in the city of Benghazi classified through focus group discussion:

**TABLE 5.4 ISSUES OBTAINED FROM FOCUS GROUP DISCUSSION**

<b>SOCIAL CHALLENGES</b>	<b>ECONOMIC CHALLENGES</b>	<b>ENVIRONMENTAL CHALLENGES</b>	<b>INSTITUTIONAL CHALLENGES</b>
Lack of management over public sector.	Lack of efficient transportation system (roads, bridges)	Increase of violations against agricultural projects.	Lack of reliable communication system.
National Reconciliation. gender equity in terms of jobs opportunities.	Lack of efficient airports.	Lack of government support for agricultural projects.	Spreading of corruption.
Lack of solving the problem of displaced citizens.	lack of control over the ownership of cars.	Absence of awareness of the importance of green spaces.	Lack of postal mail services.
Lack of awareness of other cultures.	Reconstructing the damaged areas of the city form the war.	Absence of awareness of the danger of desertification.	Lack of connections between organizations.
Lack of resilience with international cultures.	Lack of control over the CO2 emission.	Lack of equivalent distribution of Population across the country.	Centralized government rather than decentralized.
Lack of cooperation between the city municipality and the citizens.	Lack of proper public transportation.	Increase of percentage of total population living in coastal areas.	Inefficiency of telecommunication systems.
Unilateral decisions with the municipality.	Lack of available reliable data.	Lack of updating water networks.	Lack of modern banking systems.
Unorganized planning for the city.	Lack of future plans for alternative choices of fuels.	Lack of surrounding the city by green spaces.	Lack of administrative monitoring.
Lack of international understanding of the Libyan culture and political situation.	Absence of awareness of use of power sources.	Misuse of agricultural land.	Lack of updated system for institutions.
Lack of time table planning for the city.	Lack of efficient electrical power sources.	Increase of salinity land.	Political instability which affected the institutions within the country in general.
Lack of appropriate educational institutions.	Lack of alternative sources of income.	The absence of the environmental monitoring process for air pollution.	
Lack of medical management system.	Lack of stable economy.		
Religion and cultural radicalism.	Lack of fixed market prices.		
Lack of work life balance.	Lack of industrial activities.		
lack of efficiency at work			
lack of free media.			

Lack of sharing social problems with the media such as (crimes and corruption).	Government Unilateral decisions for economic development and lack of sharing decisions with academic skills.	Lack of support for requirements of agricultural products.	Lack of institutional capacity.
Illegal migration.		Increase of air pollution by gases emitted especially from cars.	
Slow implementation of projects.	Corruption.		Lack of futuristic vision for building appropriate institutions.
Lack of proper sewerage network.	Lack of chances for doing businesses and creating alternative economical activities.	Lack of attention from the city's municipality to the importance of green spaces.	
Lack of reliable sanitation system.	Lack of tourism market.	Lack of appropriate decisions for green spaces planning.	Lack of continues settlement for the institutional system.
Future vision for alternative sources of water.	Lack of investments in the city (hotels and resorts)	Lack of awareness of the value of the energy.	Institutional division.
Inefficient waste collection system.	Lack of awareness of being tourism friendly.		
Inefficient control over spreading of slums.	Lack of training of manpower.	Lack of drainage networks in most areas.	
Increase of unemployment rate.	Lack of appropriate connectivity mobile networks.	Lack of waste management.	
Lack of efficient health care.		Lack of awareness and understanding the value of drinking water and proper sanitation system.	
Lack of security.	Almost 90% dependency on importing contraction materials.	Lack of appropriate construction for sanitations and drinking water systems.	
Increase of crime.			
Shortage in medical supplies.			
Increase of local poverty.			
Increase in the number of unmarried women and men.			
Lack of affordable houses.			
Lack of control over spreading guns.			
Control over the areas of informal settlements.			
Lack of availability of basic needs such as water and electricity in some areas.			

<p>Lack of awareness of appropriate driving and parking.</p> <p>Lack of manners.</p>			
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**SOURCE: AUTHOR 2019**

According to Creswell & Miller (2000), triangulation is a valid procedure where a researcher is collecting information from various sources including interviews, observations, documents sources and among different types of investigations (Creswell & Miller, 2000).

As a valid procedure, triangulation is a step taken by the researcher to go through the data collected and find a common ground or find a unified category through eliminating overlapping areas (Creswell & Miller, 2000).

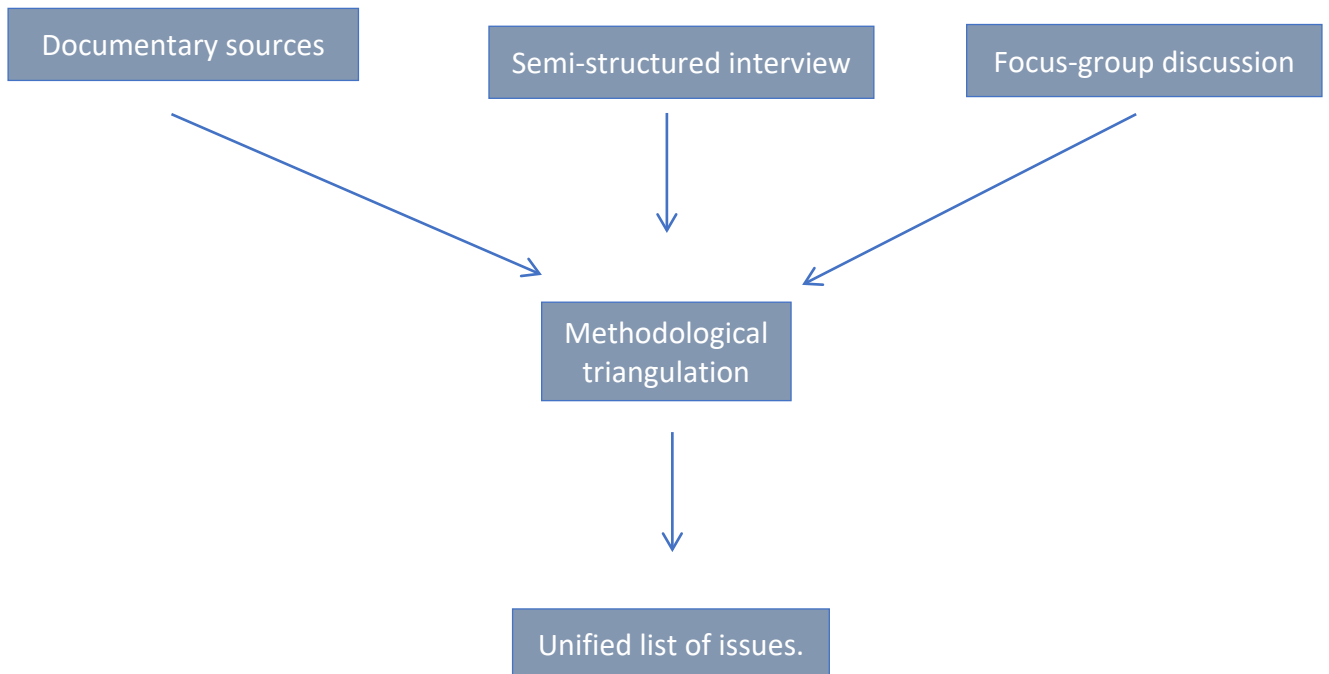
According to Rugg (2010), there are four types of triangulations. These are:

- 1- **Data triangulation:** this type includes collecting data from different sampling categories such as, collecting data at different times, in different context and from different people.
- 2- **Methodological triangulation:** this type is used with a combination of methods to create a more rounded picture of the research. Alternatively, the researcher can use method triangulation for a data that is collected using (semi-structured interview, focus-group discussion and documentary sources). This type of triangulation can help to confirm reliability and validity of the data.
- 3- **Investigator triangulation:** is the use of more than just one investigator, interviewer, observer or researcher for data analysis.
- 4- **Theory triangulation:** is the use of multiple theories or hypotheses

when examining a situation or phenomenon. The concept is to look at an idea from a different viewpoint (Rugg, 2010).

The type of triangulation chosen for this research is based on the nature of the research. Due to the fact that data collected in this research is gathered through three categories (documentary source, semi-structured interview, and focus-group discussion), the methodological triangulation was chosen to unified the issues of the city of Benghazi.

**FIGURE 5.2: DIAGRAM OF TRIANGULATION OF DATA COLLECTED IN THE RESEARCH (AUTHOR).**



In addition, all issues that were gathered through semi-structured interviews, group discussions and documentary sources are all unified in one table as shown in table 5.5. This unified list, is the list that will be used to create and construct the objectives which is the second step of the ALISA methodology. Table 5.5 illustrates the unified list of social, economic, environment and institutional issues in the city of Benghazi.

Unified list of social, economic, environment and institutional issues in the city of Benghazi:

**TABLE 5.5 THE UNIFIED LIST OF SOCIAL, ECONOMIC, ENVIRONMENTAL AND INSTITUTIONAL ISSUES AND PROBLEMS OF BENGHAZI**

<b>SOCIAL CHALLENGES</b>	<b>ECONOMIC CHALLENGES</b>	<b>ENVIRONMENTAL CHALLENGES</b>	<b>INSTITUTIONAL CHALLENGES</b>
Lack of management over public sector.	Lack of efficient transportation system (roads, bridges)	Increase of violations against agricultural projects.	Lack of reliable communication system.
National Reconciliation.	Reconstructing the damaged areas of the city form the war.	Lack of government support for agricultural projects.	Spreading of corruption.
gender equity in terms of jobs opportunities.	Lack of efficient airports.	Absence of awareness of the importance of green spaces.	Lack of postal mail services.
Lack of solving the problem of displaced citizens.	lack of control over the ownership of cars.	Absence of awareness of the danger of desertification.	Lack of connections between organizations.
Lack of awareness of other cultures.	Lack of control over the CO2 emission.	Lack of equivalent distribution of Population across the country.	Centralized government rather than decentralized.
Lack of resilience with international cultures.	Lack of proper public transportation.	Increase of percentage of total population living in coastal areas.	Inefficiency of telecommunication systems.
Lack of cooperation between the city municipality and the citizens.	Lack of available reliable data.	Lack of updating water networks.	Lack of modern banking systems.
Unilateral decisions with the municipality.	Lack of future plans for alternative choices of fuels.	Lack of surrounding the city by green spaces.	Lack of administrative monitoring.
Unorganized planning for the city.	Absence of awareness of use of power sources.	Misuse of agricultural land.	Lack of updated system for institutions.
Lack of international understanding of the Libyan culture and political situation.	Lack of efficient electrical power sources.		Political instability which affected the institutions within the country in general.
Lack of time table planning for the city.	Lack of alternative sources of income.		
Lack of appropriate educational institutions.	Lack of stable economy.		Lack of institutional capacity.
Lack of medical management system.	Lack of fixed market prices.		Lack of futuristic vision for building appropriate institutions.
Religion and cultural radicalism.	Lack of industrial activities.		
Lack of work life balance.			

<p>lack of efficiency at work</p> <p>lack of free media.</p> <p>Lack of sharing social problems with the media such as (crimes and corruption).</p> <p>Illegal migration.</p> <p>Slow implementation of projects.</p> <p>Lack of proper sewerage network.</p> <p>Lack of reliable sanitation system.</p> <p>Future vision for alternative sources of water.</p> <p>Inefficient waste collection system.</p> <p>Inefficient control over spreading of slums.</p> <p>Increase of unemployment rate.</p> <p>Lack of efficient health care.</p> <p>Lack of security.</p> <p>Increase of crime.</p> <p>Shortage in medical supplies.</p> <p>Increase of local poverty.</p> <p>Increase in the number of unmarried women and men.</p> <p>Lack of affordable houses.</p> <p>Lack of control over spreading guns.</p> <p>Control over the areas of informal settlements.</p>	<p>Government Unilateral decisions for economic development and lack of sharing decisions with academic skills.</p> <p>Corruption.</p> <p>Lack of chances for doing businesses and creating alternative economical activities.</p> <p>Lack of tourism market.</p> <p>Lack of investments in the city (hotels and resorts)</p> <p>Lack of awareness of being tourism friendly.</p> <p>Lack of training of manpower.</p> <p>Lack of appropriate connectivity mobile networks.</p> <p>Almost 90% dependency on importing contraction materials.</p> <p>Poor banking service.</p> <p>Lack of railways.</p> <p>Lack of repairing damaged parts of roads.</p> <p>No pedestrian roads crossings.</p> <p>Lack of industrial activities.</p>	<p>Increase of salinity land.</p> <p>The absence of the environmental monitoring process for air pollution.</p> <p>Lack of support for requirements of agricultural products.</p> <p>Increase of air pollution by gases emitted especially from cars.</p> <p>Lack of attention from the city's municipality to the importance of green spaces.</p> <p>Lack of appropriate decisions for green spaces planning.</p> <p>Lack of awareness of the value of the energy.</p> <p>Lack of drainage networks in most areas.</p> <p>Lack of waste management.</p> <p>Lack of awareness and understanding the value of drinking water and proper sanitation system.</p> <p>Lack of appropriate construction for sanitations and</p>	<p>Lack of continues settlement for the institutional system.</p> <p>Institutional division.</p> <p>Lack of trust between governmental institutions.</p> <p>Lack of awareness of responsibility.</p> <p>The impact of the political situation on the efficiency of the institutions.</p>
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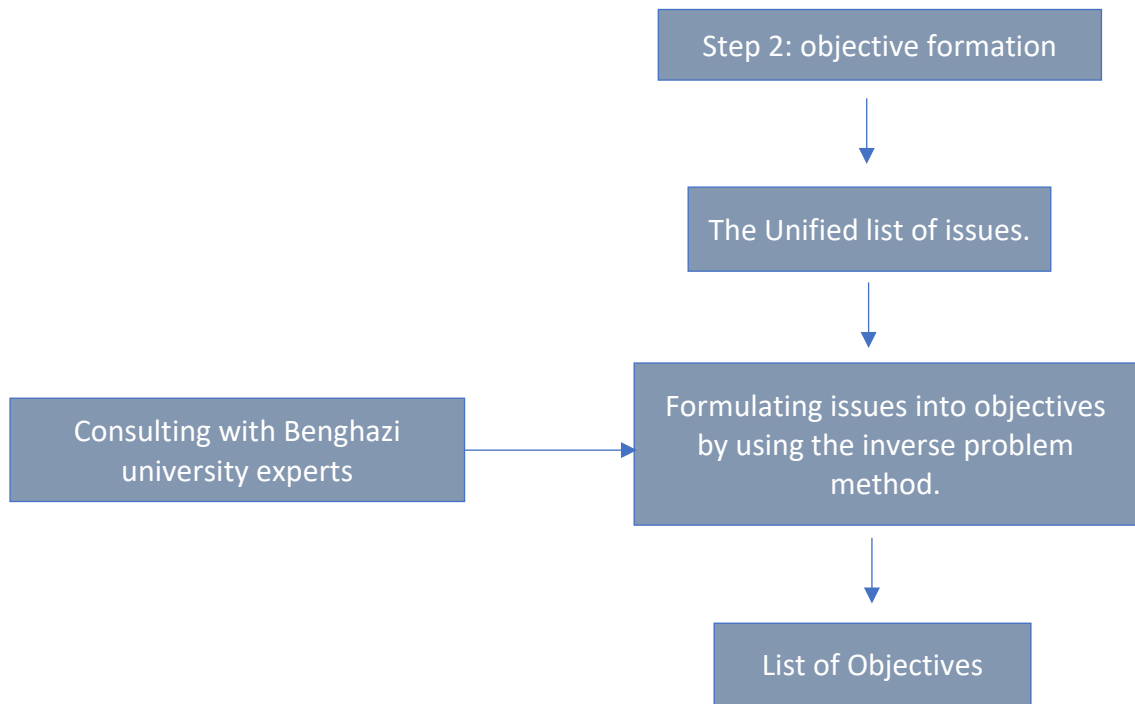
<p>Lack of availability of basic needs such as water and electricity in some areas.</p> <p>Lack of awareness of appropriate driving and parking.</p> <p>Lack of manners.</p> <p>Shortage in housing projects.</p> <p>Lack of private investments in health sector.</p> <p>lack of awareness of danger of general waste which effect general health.</p> <p>Lack of training programs for new graduates.</p> <p>Ineffective teaching technics at schools.</p> <p>The issue of brain drains.</p> <p>Lack of efficient leisure and sport centres for youth.</p>		<p>drinking water systems.</p> <p>Weak governmental support to the environmental institutions.</p> <p>Lack of awareness of the importance of natural lakes in the city.</p> <p>Lack of governmental protection towards the natural lakes in the city.</p> <p>Increase the level of ground water in some residential areas.</p> <p>The lack of the necessary equipment to maintain green spaces and parks.</p> <p>Increase number of cars.</p>	
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**SOURCE: AUTHOR 2019**

### **5.3 THE SECOND STEP (OBJECTIVE FORMATIONS):**

Based on the formulation of issues and challenges in the city of Benghazi which were developed through the analysis from the documentary sources, semi-structured interviews and focus-group discussions, a list of objectives and issues is developed with the help from environmental and urbanizations experts from the university of Benghazi as showing in table 5.6. Figure 5.3 illustrates the method of the second step of the ALISA methodology which is the formation of the objectives list:

**FIGURE 5.3: STEPS OF THE CONSTRUCTING OF THE LIST OF OBJECTIVES.**



### **5.3.1 INVERSE PROBLEM METHOD (IPM):**

One of the main challenges for data collection was the determination of what citizens of Benghazi need in their city. And by creating a clear list of objectives, a clear and accepted results can be found. Once objectives are formulated, identifying policy responses or transforming goals into actions will also be clear (Bureau of Local Government Development and DILG, 2008). Therefore, in this research the formation of the objectives has been conducted through the implementation of (IPM).

In many researching fields such as engineering, physics or applied mathematics, modeling would include predicting the consequences of an already known information. This method is known as the (Forward problem method). On the other hand, when using the inverse problem method, we usually start with results which were created from the known information (Subramaniyam 2018) . Therefore, using the concept of objective as the inverse of the problem is used for this research to form the objectives list as showing in table 5.6. For example,

the issue of poor public sector management, the objective would be the inverse of the problem which is improving the public sector management.

In addition to that, these issues were categorized based on the similarity of the core of the problems. For example, Lack of awareness of other cultures, lack of resilience with international cultures and religion and cultural radicalism are all under the same category of communicating with the international community based on the consultation of experts from the university of Benghazi.

**Table 5.6** illustrate the objectives created through the analysis of the issues and problems of the city of Benghazi.

**TABLE 5.6 THE OBJECTIVES CREATED THROUGH THE ANALYSIS OF THE ISSUES AND PROBLEMS OF THE CITY OF BENGHAZI.**

Issues	Objectives
<b>social</b>	
Poor public sector management.	To improve public sector management.
Lack of awareness of other cultures. Lack of resilience with international cultures. Lack of international understanding of the Libyan culture and political situation. Religion and cultural radicalism.	To integrate the local community with the international community.
Lack of cooperation between the city municipality and the citizens. Unilateral decisions with the municipality. National Reconciliation. Lack of solving the problem of displaced citizens.	To create connections between citizens and municipality. To establish national reconciliation. To solve the issue of displaced citizens.
Unorganized planning for the city. Lack of time table planning for the city.	To have better planning for the city. To have better time management for city planning.
Lack of appropriate educational institutions. Ineffective teaching techniques at schools. Lack of efficient leisure and sport centres for youth.	To improve educational institutions. To improve educational system. To provide youth centres and activities.

<p>Lack of medical management system.</p> <p>Lack of efficient health care.</p> <p>Shortage in medical supplies.</p> <p>Lack of private investments in health sector.</p>	<p>To improve the medical system and health care.</p> <p>To provide enough medical supplies.</p> <p>To invest more in health sector.</p>
<p>Lack of work life balance.</p> <p>lack of efficiency at work.</p> <p>Lack of gender equity in terms of jobs opportunities.</p>	<p>To improve the efficiency of work by balancing the hours of work and leisure time.</p> <p>To increase opportunities for females.</p>
<p>lack of free media.</p> <p>Lack of sharing social problems with the media such as (crimes and corruption).</p>	<p>To ensure and protect freedom of media.</p>
<p>Illegal migration.</p> <p>The issue of brain drains.</p>	<p>To Improve the borders security.</p> <p>To create work and living opportunities for people.</p>
<p>Slow implementation of projects.</p> <p>Lack of proper sewerage network.</p> <p>Lack of reliable sanitation system.</p> <p>Future vision for alternative sources of water.</p> <p>Inefficient waste collection system.</p> <p>lack of awareness of danger of general waste which effect general health.</p> <p>Inefficient control over spreading of slums.</p> <p>Lack of affordable houses.</p> <p>Control over the areas of informal settlements.</p>	<p>To accelerate implementation of projects.</p> <p>To improve sewerage network.</p> <p>To improve sanitation system.</p> <p>To create alternative water sources.</p> <p>To improve waste collection techniques.</p> <p>To improve housing projects.</p>
<p>Increase of unemployment rate.</p> <p>Increase of local poverty.</p>	<p>To reduce unemployment.</p> <p>To reduce poverty rate.</p>

Lack of training programs for new graduates.	
Lack of security. Increase of crime. Lack of control over spreading guns.	To improve the security system.
Increase in the number of unmarried women and men.	To assist youth for marriage and reduce Spinster rate.
Lack of availability of basic needs such as water and electricity in some areas.	To provide and secure basic needs for citizens.
Lack of awareness of appropriate driving and parking. Lack of public manners.	To improve public parking facilities. Increase awareness of importance of public manners.
<b>Economic</b>	
Lack of efficient transportation system (roads, bridges) Lack of efficient airports. Lack of proper public transportation. lack of control over the ownership of cars. Lack of control over the CO2 emission. Lack of railways. Lack of repairing damaged parts of roads. No pedestrian roads crossings. Lack of reconstructing the damaged areas of the city form the war.	To provide better transportations facilities. To improve laws of ownership of cars. To control importing old cars. To improve transportation infrastructure. To build alternative facilities of transportation rather than just roads.  To rebuild damaged areas of city.
Lack of available reliable data.	To create a data base.
Lack of future plans for alternative choices of fuels.	To provide more efficient sources of power.

<p>Absence of awareness of use of power sources.</p> <p>Lack of efficient electrical power sources.</p>	
<p>Lack of alternative sources of income.</p> <p>Lack of stable economy.</p> <p>Lack of fixed market prices.</p> <p>Lack of industrial activities.</p> <p>Government Unilateral decisions for economic development and lack of sharing decisions with academic skills.</p> <p>Corruption.</p> <p>Lack of chances for doing businesses and creating alternative economical activities.</p> <p>Lack of tourism market.</p> <p>Lack of investments in the city (hotels and resorts)</p>	<p>To create alternative sources of income.</p> <p>To provide better economic foundation.</p> <p>To monitor the goods prices in the market.</p> <p>To create communications between governments and academic experts.</p> <p>To tackle corruption.</p> <p>To create opportunities for economic development and support tourism sector.</p>
<p>Lack of awareness of being tourism friendly.</p> <p>Lack of training of manpower.</p>	<p>To integrate with the international communities and to be tourism trained.</p>
<p>Lack of appropriate connectivity mobile networks.</p> <p>Poor banking service.</p>	<p>To improve communication networks.</p> <p>To improve banking services.</p>
<p>Almost 90% dependency on importing contraction materials.</p> <p>Lack of industrial activities.</p>	<p>To improve the industrial sector.</p>
<b>Environment</b>	
<p>Increase of violations against agricultural projects.</p>	<p>Improve the rule of law towards violations.</p> <p>To support agricultural projects.</p>

<p>Lack of government support for agricultural projects.</p> <p>Misuse of agricultural land.</p> <p>Increase of salinity land.</p> <p>Lack of support for requirements of agricultural products.</p>	<p>To improve the quality of soil.</p> <p>To support agricultural projects with required equipment.</p>
<p>Absence of awareness of the importance of green spaces.</p> <p>Absence of awareness of the danger of desertification.</p> <p>Lack of surrounding the city by green spaces.</p> <p>Lack of attention from the city's municipality to the importance of green spaces.</p> <p>Lack of appropriate decisions for green spaces planning.</p> <p>The lack of the necessary equipment to maintain green spaces and parks.</p>	<p>Improve distribution of green spaces in the city.</p> <p>Increase alertness of risk of desertification.</p> <p>To improve government support for implementation of green spaces in the city.</p>
<p>Lack of equivalent distribution of Population across the country.</p> <p>Increase of percentage of total population living in coastal areas.</p>	<p>Balancing the distribution of the population.</p> <p>To support the outlying areas economically.</p>
<p>Lack of updating water networks.</p>	<p>To update water networks.</p>
<p>The absence of the environmental monitoring process for air pollution.</p> <p>Increase of air pollution by gases emitted especially from cars.</p> <p>Increase number of cars.</p>	<p>To Improve monitoring process for air pollution.</p> <p>To improve rules about cars ownership.</p>
<p>Lack of awareness of the value of the energy.</p>	<p>To improve awareness of value of energy.</p>



<p>Lack of drainage networks in most areas.</p> <p>Lack of waste management.</p> <p>Lack of awareness and understanding the value of drinking water and proper sanitation system.</p> <p>Lack of appropriate construction for sanitations and drinking water systems.</p> <p>Increase the level of ground water in some residential areas.</p>	<p>To improve drainage networks.</p> <p>To improve waste management.</p> <p>To increase awareness of the value of drinking water and sanitation system.</p> <p>To improve infrastructure for drinking water and sanitation system.</p> <p>To improve rain drainage system.</p>
<p>Weak governmental support to the environmental institutions.</p>	<p>To improve governmental support to environmental institutions.</p>
<p>Lack of awareness of the importance of natural lakes in the city.</p> <p>Lack of governmental protection towards the natural lakes in the city.</p>	<p>To increase public awareness about importance of natural lakes.</p> <p>To improve government protection towards city lakes.</p>
<b>Institutional</b>	
<p>Lack of reliable communication system.</p> <p>Lack of postal mail services.</p> <p>Lack of connections between organizations.</p> <p>Centralized government rather than decentralized.</p> <p>Inefficiency of telecommunication systems.</p>	<p>To improve communication, telecommunications and postal systems.</p> <p>To support connections between organizations.</p> <p>To decentralized institutions.</p>
<p>Lack of modern banking systems.</p> <p>Lack of updated system for institutions.</p>	<p>To improve banking services.</p> <p>To improve institutional systems.</p>
<p>Spreading of corruption.</p> <p>Lack of administrative monitoring.</p>	<p>To tackle corruption.</p> <p>To improve monitoring administrations.</p>

Lack of institutional capacity.	To improve institutional capacity.
<p>Political instability which affected the institutions within the country in general.</p> <p>Lack of futuristic vision for building appropriate institutions.</p> <p>Lack of continues settlement for the institutional system.</p> <p>Institutional division.</p> <p>Lack of trust between governmental institutions.</p> <p>Lack of awareness of responsibility.</p> <p>The impact of the political situation on the efficiency of the institutions.</p>	<p>To support political stability.</p> <p>To create a future vision for improving institutions.</p> <p>To support institutional settlement.</p> <p>To unified institutions.</p> <p>To improve trust between institutions.</p> <p>To increase awareness of responsibility.</p> <p>To improve the political situation.</p>

**SOURCE: AUTHOR 2019**

#### **5.4 The third and fourth step (indicator preparation and indicator selecting):**

The preparation of the first list of sustainability indicators is built up on logical information and procedure which has been supported by consultants and specialists in sustainability and urbanization from the University of Benghazi as well as searching through literature on sustainability development. The preparation of the sustainability indicators list was also, based on the characteristics of sustainability indicators created by Smith (2002) which emphasis on three main factors when preparing sustainability indicators. These factors are: simple, widely credible and easily understood by public and policy makers (Smith 2002).

Furthermore, through the application of the basic approach of the United Nations Educational, Scientific and Cultural Organization UNESCO (2003), which illustrate the procedure of creating potential indicators by involving the following steps:

- Think of possible alternative indicators for each concept,
- objective, and output, without being too restrictive.
- Conduct internal brainstorming sessions.
- Consult stakeholders and other experts.
- Try to borrow from other projects and studies (Bangkok 2003).

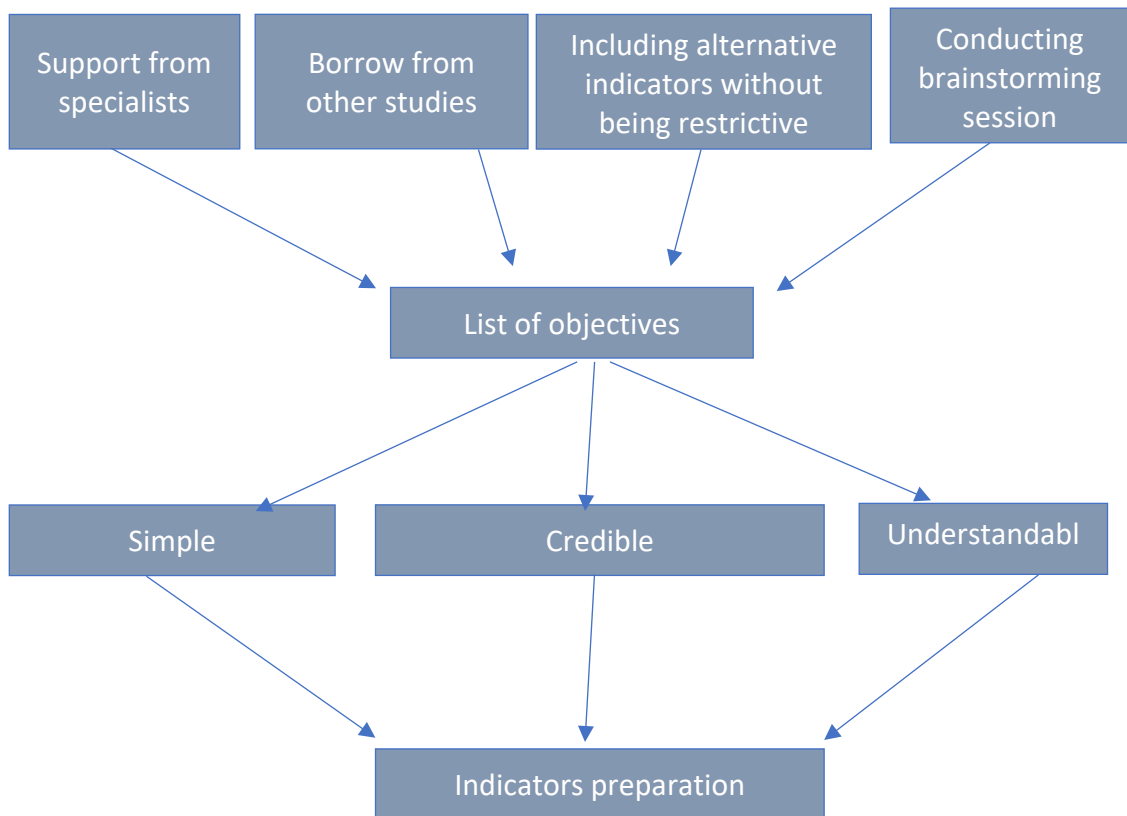
Additionally, at the stage of preparation a proposed list of indicators, it is important to consider the progress of reforming the objectives into the appropriate indicator.

For example, the formulation of the appropriate indicator that was based on the objective of (integrating the local community with the international community), required the four steps mentioned by the UNESCO 2003, which then resulted into the indicator of (Communicate with the international community). Also, the sustainability experts from the university of Benghazi recommended that the indicator (Communicate with the international community) is credible, simple and easy to understand by the public. This process was then applied to the rest of the objectives in table 5.6.

According to Bangkok (2003), indicators are based on the concept of what is relevant. They are basically the expressions of value of what is desirable. Therefore, it is important to for researchers to include stakeholders in the process of developing indicators to make sure that the data collected respond to the information needed for the research (Bangkok 2003).

By applying this approach on the list of objectives in step two, a list of 37 proposed sustainability indicators illustrated in table 5.7. This list of proposed sustainability indicators is classified based on the UNCSO 2001, which includes four themes of sustainability indicators (social, economic, environment and institutions).

**FIGURE 5.4 ILLUSTRATES THE PROCEDURE OF STEP THREE OF ALISA APPROACH:**



**TABLE 5.7 THE FIRST LIST OF PROPOSED INDICATORS:**

<b>Indicator.</b>	<b>Description</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Social</b>						
Public sector management.	Improving the management of the public sector.					
Communicate with the international community	Open communication channels with the international community.					
Municipality services towards citizens	Providing services to the citizens through municipality of Benghazi.					
City planning.	Planning of the city of Benghazi.					
Education	Private and public schools. Universities. Literacy rate.					
Youth support.	Leisure centres. Sport centres. Training programs.					
National Reconciliation.	Establishing national reconciliation between citizens.					
Lack of solving the problem of displaced citizens.	Building new houses and supporting them financially and socially.					
Gender equity	Equalize opportunities between males and females.					
Health care.	Public and private hospitals. Ratio of people who access public hospitals. Quality of health services.					
Work life balance.	Average daily hours worked.					
Freedom of media.	Freedom of speech. Right to participate in public opinion.					
Security.	Crime rate. Using weapons in public spaces.					

Poverty rate.	Number of people living below poverty line.					
Spinster rate.	Number of unmarried people.					
Public manners.	People behavior in public places.					
<b>Economic</b>						
Transportation system, roads, public parking spaces.	Railways, bridges, airports and highways.					
Infrastructure.	Roads, housing projects, sanitation and drinking water systems and bridges.					
Unemployment rate.	Number of people employed.					
Reconstruction.	Reconstruction of damages areas of the city.					
Energy sources.	Energy use. Energy sources such as electricity, gas and petrol.					
Data sources.	Availability of proper database system.					
Economic development.	Improving the economic system. Improving GDP per capita. Control over prices of goods.					
Corruption.	Tackling corruption in all governmental systems.					
Banking services.	Availability of cash. Financial services.					
Communication networks.	Mobile networks. Internet services.					
Tourism.	Hotels, resorts and tourist attractions.					
<b>Environment</b>						

Public land violations.	Control over violations towards public lands and public facilities. Slums and informal buildings.					
Green spaces.	% of green spaces in the city. Parks. % desertification.					
Demographics ratio.	Population distribution within the city districts.					
Drinking water and sanitation.	Access to drinking water and sanitation (%of house hold).					
Air pollution.	Level of air pollution in the city.					
Waste management.	Landfill and recycling. Public spaces cleaning.					
Public spaces.	Availability of public spaces for leisure time.					
<b>Institutional</b>						
Institutional network.	Future planning and strategic implementation.					
Institutional efficiency/ Institutional capacity.	Capacity of institution to meet public demands.					
Political situation.	Supporting political stability.					

### 5.5 THE FIFTH STEP (INDICATOR RANKING).

To ensure that the developed sustainability indicators list is more effective, a procedure of ranking was developed. According to the London Sustainable Development Commission (LSDC) (2004), prioritizing sustainability indicators is important for actions. It shows that either the London situation is worse or better than the rest of the cities in the UK (London Sustainable Development 2004).

After conducting a list of sustainability indicators for the city of Benghazi, this list was then given and introduced to a number of 100 locals. These people included, doctors, architectures, media journalists, lawyers, teachers, community services members, social media activists, sport people and other member of the local community.

In addition to that, the procedure of selecting the 100 participants was based on two categories. First the numbers of participants had to be equal between females and males. Therefore, the questionnaire survey was given to 50 females and 50 males. The choice of the area of the city was based on dividing the city map into four districts, east, west, east south and west south as showing in figure 5.5.

**FIGURE 5.5 THE MAP OF BENGHAZI**



SOURCE: EDITED BY AUTHOR BASED ON GOOGLE MAP 2019.



As mentioned in chapter 3 (methodology chapter), each participant was asked to rank the given indicators based on the level of importance. The questionnaire applied the Likert scale that had a ranking number from 1 to 5 attached with description for each indicator (see Appendix one). Also, participants who participated in the questionnaire were given extra questions about the problems of the city of Benghazi in terms of sustainability and the priorities which need to be considered when making Benghazi a sustainable place.

In addition to that, the scale that was given to the local participants to rate the 37 indicators is based on the rating of 1 to 5. Where 1 is classified as not important, 2 less important, 3 important, 4 very important and 5 classified as vital. Furthermore, after adding the rating scale and finding the total for each indicator, an average score for each indicator was calculated using Excel calculation. Therefore, ranking the averages of the indicators would reveal the overall preference of each respondent.

On the other hand, conducting a questionnaire survey should be after ensuring a pilot study has taken place first. According to Van Teijlingen and Hundley (2002), the impotence of pilot studies when conducting a questionnaire survey is to identify the potential practical problems, such as the distribution of the questionnaire could not be adhered (Van Teijlingen and Hundley 2002).

Therefore, to ensure that the procedure will succeed, a pilot study was applied on five participants as an attempting of the study. The pilot survey resulted useful information on the level of understanding of the questions as well as the time of answering the questions.

The preparation of the survey questions was based on the methodology developed by (Colosi 2006) which includes the following steps:

- 1- Starting with a clear introduction that is both informative about the purpose of the questionnaire.
- 2- Use an easy-to-read question.

- 3- Do not break question text or instructions to turn pages.
- 4- If needed, place any explanatory text or definitions in parenthesis immediately after the question.
- 5- The first questions should be easy to read.
- 6- It is also recommended to start with more general questions.
- 7- Pay attention to the flow of questions (Colosi 2006).

In addition, Excel was used to calculate the averages and the ranking of the 37 indicators based on the local community answers to the survey questionnaire illustrated in Appendix one. According to many authors, the use of Likert scale is a very effective method especially when conducting a questionnaire survey. For example, Hasson and Arnetz (2005), Likert scale is an easy method to use and understand for both, researchers and respondents. It also, takes less time to explain and apply to any participants (Hasson and Arnetz 2005).

In addition, Nemoto and Beglar (2014) argue that Likert scale is a psychometric scale that has multiple categories from which respondents choose to indicate their opinion. Furthermore, data can be collected relatively quicker from a large number of people and provide a highly reliable estimation that can assist to establish data based on a variety of means (Nemoto and Beglar 2014).

In the same manner, Bertram (2013) summaries the advantages of using the Likert scale as simple to construct, likely to produce a highly reliable scale and easy to read and complete for participants (Bertram 2013). Thus, the average score for each of the 37 indicators was calculated and used to rank the priority of the indicators.

The results of the questionnaire analysis which included the averages and ranking of the sustainability indicators in the city of Benghazi are shown in table 5.8.

**TABLE 5.8 RESULTS OF QUESTIONNAIRE ANALYSIS:**

<b>Indicator.</b>	<b>Average</b>	<b>Rank</b>
Unemployment rate.	4.47	1
Health care.	4.43	2
Infrastructure.	4.42	3
Banking services.	4.36	4
Gender equity.	4.35	5
Corruption.	4.34	6
City planning.	4.3	7
Education.	4.23	8
Waste management.	4.22	9
Economic development.	4.21	10
Security.	4.2	11
Public manners.	4.19	12
Drinking water and sanitation.	4.16	13
Public sector management.	4.15	14
Public spaces.	4.13	15
Reconstruction.	4.08	16
Green spaces.	4.07	17
Political situation.	4.06	18
Poverty rate.	4.05	19
Energy sources.	4.04	20
Data sources.	4.03	21
Institutional network.	4	22
Lack of solving the problem of displaced citizens.	3.99	23
Municipality services towards citizens.	3.97	24
Institutional efficiency/ Institutional capacity.	3.95	25
Communication networks.	3.94	26
Demographic ratio.	3.92	27

Air pollution.	3.91	28
Public land violations.	3.9	29
Transportation system, airport roads, public parking spaces.	3.77	30
Tourism.	3.76	31
Youth support.	3.73	32
Spinster rate.	3.7	33
National reconciliation.	3.49	34
Freedom of media.	3.2	35
Communication with the international community.	3.18	36
Work-life balance.	3.05	37

**SOURCE: AUTHOR 2019**

Based on the UNCSD thematic sustainability indicators, the following table was developed to illustrate the final list of sustainability indicators for the city of Benghazi based on institutional and local levels.

**TABLE 5.9. FINAL LIST OF SUSTAINABILITY INDICATORS FOR THE CITY OF BENGHAZI IN LIBYA.**

<b>Index</b>	<b>Theme</b>	<b>Sub-theme</b>	<b>Indicator.</b>
Social	Equity	Poverty	Unemployment rate.
Social	Health	Healthcare	Number of people receiving healthcare.
Economic	Infrastructure.	Infrastructure	Ratio of Infrastructure in the city.

Economic	Economic structure	Financing	Banking services level.
Social	Gender	Equity	Gender equity.
Institutional	Governance system.	Corruption	Level of corruption.
Social	Governance system.	Urbanization	City planning.
Social	Education	Education level.	Number of people with access to education.
Social	Health	Sanitation	Waste management.
Economic	Economic system	Development	Level of annual economic development
Social	Security	Crime	Level of crime in the city.
Social	Behavior	Public behavior	Public manners.
Social	Health	Sanitation	Access to drinking water and sanitation.
Institutional	Governance system	Public sector	Public sector management.
Social	Health	Wellbeing	Ratio of public spaces for citizens leisure.
Economic	Infrastructure	Development	Reconstruction of destroyed areas of the city.

Environment	Health	Wellbeing	Ration of green spaces in the city.
Institutional	Institutional	Constitution	Political situation.
Social	Equity	Poverty	Poverty rate per capita.
Economic	Consumption and production	Energy use	Number of alternative energy sources.
Institutional	Governance system	System	Availability of data sources.
Institutional	Institutional	Networking	Level of institutional networking.
Social	Equity	Poverty	Lack of solving the problem of displaced citizens.
Institutional	Institutional capacity	Government performance	Level of satisfaction regarding municipality services towards citizens.
Institutional	Institutional performance	Institutional performance	Institutional efficiency/ Institutional capacity.
Economic	Infrastructure	Communication infrastructure	Access of communication

			networks and services.
Social	Equity	Social stability	Demographic ratio.
Environment	Health	Health	Air pollution ratio.
Social	Violence	Security	% of public land violations.
Economic	Infrastructure	Infrastructure	Level of transportation system, airport roads, public parking spaces.
Economic	Economic	Economic development	Ratio of tourism in the city.
Social	Equity	Wellbeing	Level of youth support from government.
Social	Equity	Gender equity	Spinster rate of the total population.
Social	Government	Government	National reconciliation.
Social	Security	Security	Level of freedom of media.
Social	Social development	Development	Level of communication with the international community.

Economic	Government system	Government system	Work-life balance.
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**SOURCE: AUTHOR 2019**

In addition to that, when referring to the numbers of females and males in a society it is called gender ratio. This ratio is not fixed however, it is shaped by biological, social, technological, cultural, and economic forces in the community. Therefore, the gender ratio has an impact on societies socially and economically (Our world in data 2019).

Furthermore, as mentioned previously in this chapter, when the questionnaire survey was distributed, it was based on gender level. Therefore, the following tables illustrates the ranking of sustainability indicators in the city of Benghazi based on the context of gender ratio. Also, by finding the gap between the two genders, it is possible to analysis the difference and conditions in policies and institutions.

According to Stratigaki (2005), the successful implementation of positive action in political decision-making had challenged the gender distribution of political decision over policy institutions and technical, as well as human financial resources (Stratigaki 2005)



**TABLE 5.10 ILLUSTRATES THE FEMALE RESPONDENTS' RANKING OF THE SUSTAINABILITY INDICATORS IN THE CITY OF BENGHAZI.**

<b>Indicator.</b>	<b>Average</b>	<b>Rank</b>
Unemployment rate.	4.54	1
Gender equity. Health care. Infrastructure.	4.38	2,3,4
Economic development.	4.36	5
Corruption. Banking services. Waste management.	4.32	6,7,8
City planning. Public spaces.	4.28	9,10
Education	4.24	11
Public manners. Reconstruction.	4.18	12,13
Data resources.	4.16	14
Green spaces.	4.12	15
Poverty rate. Air pollution	4.1	16,17
Public sector management. Youth support. Drinking water and sanitation.	4.08	18,19 ,20
Lack of solving the problem of displaced citizens. Energy sources. Political situation.	4.06	21,22 ,23
Demographics ratio.	4.04	24
Security.	4.02	25
Institutional efficiency/ Institutional capacity.	4	26
Transportation system, roads, airport, public parking spaces. Tourism.	3.98	27,28
Institutional network.	3.96	29
Public land violations.	3.94	30
National Reconciliation.	3.92	31
Municipality services towards citizens	3.9	32
Communication networks.	3.88	33
Spinster rate.	3.64	34
Communicate with the international community	3.62	35
Freedom of media.	3.56	36
Work life balance.	3.32	37

**SOURCE: AUTHOR 2019**

**TABLE 5.11 ILLUSTRATES THE MALE RESPONDENTS' RANKING OF THE SUSTAINABILITY INDICATORS IN THE CITY OF BENGHAZI.**

<b>Indicator.</b>	<b>Average</b>	<b>Rank</b>
Health care.	4.48	1
Infrastructure.	4.46	2
Unemployment rate. Banking services.	4.4	3,4
Security.	4.38	5
Corruption.	4.36	6
City planning. Gender equity	4.32	7,8
Drinking water and sanitation.	4.24	9
Public sector management. Education	4.22	10,11
Public manners.	4.2	12
Waste management.	4.12	13
Economic development. Political situation.	4.06	14,15
Municipality services towards citizens. Institutional network.	4.04	16,17
Energy sources. Green spaces.	4.02	18,19
Poverty rate. Communication networks.	4	20,21
Reconstruction. Public spaces.	3.98	22,23
Lack of solving the problem of displaced citizens.	3.92	24
Data sources. Institutional efficiency/ Institutional capacity.	3.9	25,26
Public land violations.	3.86	27
Demographics ratio.	3.8	28
Spinster rate.	3.76	29
Air pollution.	3.72	30
Transportation system, roads, public parking spaces.	3.56	31
Tourism.	3.54	32
Youth support.	3.38	33
National Reconciliation.	3.06	34

Freedom of media.	2.84	35
Work life balance	2.78	36
Communicate with the international community	2.74	37

**SOURCE: AUTHOR 2019**

## **5.6 SUMMARY:**

This chapter has illustrated the results of the implementation of the five steps of the ALISA methodological framework in the city of Benghazi, Libya. The first step issues-clarification aimed to identify the main issues and challenges of the city of from three sources; documentary source, semi-structured interviews and focus-group discussions. The methodology effectively gathered challenges in the city of Benghazi at four pillars, social, economic, environment and institutions. Throughout the use of multiple sources of information and then triangulating the data collected, the chapter positively illustrates accurate and alternative clarifications of the issues of Benghazi. The use of triangulation method limits personal and methodological biases and enhances a study's generalizability. It also opens the way for richer and potentially more valid clarifications and understanding of the research (Decrop 1999).

Moreover, the data collected from a documentary source, semi-structured interviews and focus-group discussions, were transcribed, analyzed and classified using a thematic analysis approach. The data was also analyzed based on the key themes of the UNCSD theme indicator framework (2001), which includes social, economic, environment and institutions.

This step then led to developing a unified list of issues which was then used for the second step (the formation of objectives). This included reformulating the issues of the city of Benghazi into objectives based on the formula of Inverse-problem presented by (Subramaniyam 2018). In addition, with the help from

sustainability experts from the university of Benghazi as explained in section 5.3 of this chapter, a list of objectives was developed for each of the issues gathered. Usually, one objective would be formulated based on one issue, however in this research an objective was developed for two or more issues based on the core meaning of the issues.

The use of the ALISA methodology in this research was found to be effective and capable of exploring the city of Benghazi stakeholders' opinions and ideas about sustainability indicators. In addition, this chapter also describes the third and fourth step (indicator preparation and indicator selecting). These two steps included developing of the first proposed list of sustainability indicators with consultation of experts and lectures from the university of Benghazi. Also, the first list of sustainability indicators was developed based on the characteristics of sustainability indicators created by Smith (2002) which emphasis on three main factors when preparing sustainability indicators. These factors are: simple, widely credible and easily understood by public and policy makers.

Furthermore, through applying the basic approach of UNESCO 2003, which illustrate the procedure of creating potential indicators by involving a number of steps illustrated in section 5.4 in this chapter, a set of sustainability indicators were developed containing 37 indicators covering the four dimensions (social, economic, environment and institutional).

Furthermore, the set of indicators included 16 social sustainability indicators, 11 economical sustainability indicators, 7 environmental sustainability indicators and 3 institutional sustainability indicators.

Consequently, the developed list of sustainability indicators was introduced to the public to rank. By dividing the geographical map of the city into four districts, (see section 5.5) the ranking procedure was conducted with a participation of 100 citizens from the city of Benghazi. This was then divided into two equal groups of 50, which were categorized on gender.

After the procedure of ranking, a final of three sets of indicators (male, female and general) were developed based on the concept of priority. This chapter has illustrated the ability, capability, and practicality of the use of the ALISA methodological framework in regard to the city of Benghazi to develop sustainability indicators based on four dimensions (social, economic, environment and institutional) and at two levels (institutional and local). These results are explained, compared, and discussed in chapter 7.

## CHAPTER 6

### IMPLEMENTATION OF THE PROPOSED ALISA METHODOLOGICAL FRAMEWORK FOR THE CITY OF AMMAN, JORDAN.

#### 6.1 INTRODUCTION:

To achieve the objective of indicators ranking at a local level, a second case study is presented in this chapter to highlight the benefits of the ALISA method to develop and sustainability indicators at an institutional and local level. As the framework ALISA was implemented in the city of Benghazi in chapter 5, the ALISA framework implementation will be conducted in the city of Amman (refugees crowded city) and presented in this chapter.

The main aim of this chapter is to achieve the followings:

- To evaluate the ALISA framework by implementing it in a case study (refugees crowded city of Amman).

- To test the feasibility of the framework used real-life case study.

- To explore the limitation of the framework after evaluating the local level sustainability in the city of Amman.

#### 6.2 IMPLEMENTATION OF THE ALISA FRAMEWORK (CONTEXT OF AMMAN):

Using the same implementation steps from the previous chapter (Benghazi case study), the ALISA was implemented in the case of Amman Jordan. Although the procedure in terms of the steps of the framework is the same, however, several differences were observed.

Firstly, the information related to sustainability indicators in Amman which was gathered through searching in literature and documents was collected through different sources to city of Benghazi. The literature regarding challenges and

issues of sustainability indicators in Jordan and the city of Amman in particular is located in chapter 4. This information includes identifying the main challenges in the city of Amman. These sources included: books, newspapers and journal articles such as (Potter et al. 2009, Ghanem 2011, Al-Jayyousi 2004, Aljaradin and Persson 2014). Also, government and non-government organisations, local records, economic studies report and international organisational reports such as the United nation and the World Bank.

Furthermore, conducting semi-structured interviews and focus-group discussions in the city of Amman, included certain people who are different from the case of Benghazi due to the differences in the context between the two cities. In other words, by making sure that interviews would include certain people such as lecturers at the universities in the city of Amman, decision-makers, people working in the governments, politicians, consultants, and the international organizations such as the Red Cross and the United Nations representative. This step then would help to understand and explore the issues of the city of Amman from the people who are working in the city's institutions "elite people".

Through the use of the snowballing technique, the process started by asking an already connected participant from the University of Jordan with whom else could be contacted to participate in the research. This procedure then resulted in a selection of 12 decision-makers who were interviewed in this research.

These included: academics at the University of Jordan, the sustainability department at the University of Zaytoonah, engineering and urbanization consultants at the Greater Amman Municipality (GAM), economic consultant of the Jordanian government, the representative of the UN in Amman, the International Federation of Red Cross & Red Crescent, the chief executive of Amman resilience, and the environmental and urbanization consultant at the GAM. The Interviews were carried out from November to December 2019. In addition, all interviews were audio recorded as well as noting the important points and answers given by the respondents.

Also, the research conducted two focus-group discussions to raise the issues that should be taken into consideration in order to create a list of sustainability indicators in Amman. Each group contained 3 participants including the researcher. The groups also included telecommunication and architecture engineers, general managers, HR managers, and trainees.

The participants of the groups were recommended by the United Nations (UN) office in Amman and the Jordan Engineers Association of Amman (JEA). In addition, the Jordan Engineers Association is a public institution that includes 146,000 engineers. It controls the profession and contributes to the planning and development of engineering education and support of the interests of its members. Also, the association improves the efficiency level of engineers in order to achieve competitiveness according to international standards as well as contributing with 22 link committees in several Arab and foreign countries. More details regarding the association in the following website ([www.jea.org.jo/portal/en/home-en/](http://www.jea.org.jo/portal/en/home-en/)).

### **6.2.1 RESULTS OF THE ANALYSIS OF THE LITERATURE REGARDING CHALLENGES IN THE CITY OF AMMAN/JORDAN:**

By analysing the data from the literature and documents about the city of Amman, the following table 6.1 shows the results of the issues and challenges in the city of Amman based on the UNCSD (2001) Theme-based framework four pillars (social, economic, environmental, and institutional).



**TABLE 6.1 THE RESULTS OF THE ISSUES AND CHALLENGES IN AMMAN  
BASED ON THE LITERATURE**

<b>SOCIAL CHALLENGES</b>	<b>ECONOMIC CHALLENGES</b>	<b>ENVIRONMENTAL CHALLENGES</b>	<b>INSTITUTIONAL CHALLENGES</b>
Tribalism interfering with the government.	Number of people in Jordan live in extreme poverty.	Increased the number of automobiles ownership.	Lack of clear policies towards prices of energy resources.
Increase the number of populations.	Inability to borrow financial support from international community.	Increase noise pollution.	Serious weaknesses and vulnerabilities in public institutions.
Sudden increase in the number of refugees and migrants.	Government budget difficulty.	Lack of accurate traffic noise data and information.	Low job satisfaction for employees.
Lack of awareness of the importance of repaying the national dept.	Increase unemployment rate.	continues imbalance in the population-water resources.	Poor working conditions.
Increase the demand of services and infrastructure.	Weak economic growth.	Lack of manners and attitudes to deal with water shortage.	Lack of skilled labour.
Lack of enough public housing projects.	The increase in the number of Syrian refugees which affected economic growth.	Loss of large amount of rain water due to pollution.	Poor logistical systems.
Changes and adds which transform the architectural characteristics.	Closing the export routes to Iraq and Syria.	Poor quality of resources of energy.	Nepotism and "Wasta" or favour-system.
Lack of commitment to	Increase in energy consumption.		Poor land-use regulations.

original designs of contraction projects.	Increase of ownership of electrical devices per household.	inefficient ways of using energy resources.	
Lack of clear street network planning.	Instability of tax rates.	Increase of CO2 emissions.	
Lack of matching between widths of streets and the size of the projects.	Lack of transparency in pricing policy.	The use of unhealthy resource for house heating.	
lack of open space.	Increase of the population moving to urban areas.	Increase the percentage of metals in the street's dust.	
lack of open space and the absence of playgrounds for children.	Lack of accurate data on work related issues.	Increase the volume of waste and its composition.	
Absence of a civic centre for public use.	Lack data on migrant expenditure and money transfer.	Lack of suitable equipment for rubbish collecting.	
Absence of building regulations.		Lack of financial support for rubbish collecting.	
Increase the large number of public buildings constructed near housing projects.		Lack of trained manpower for rubbish collection.	
lack of compliance with the original designs of buildings and projects.		lack of a comprehensive system for solid waste collection, recycling, disposal, and treatment.	
		Lack of engineered landfill sanitary.	

Lack of clear street network planning.		Increase pressure on the country's fragile water supply.  Increase noise pollution.	
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**SOURCE: AUTHOR 2019**

**6.2.2 RESULTS OF THE ANALYSIS OF THE SEMI-STRUCTURED INTERVIEWS REGARDING CHALLENGES IN THE CITY OF AMMAN/JORDAN:**

By analyzing of the transcribed semi-structured interviews in this research through using NVivo software analysis approach. This software program is used for qualitative and mixed-methods research. Precisely, it is used for the analysis of semi-structured text, audio, video, and image data, including, interviews, focus groups, surveys, social media, and journal articles. The following table 6.2 shows the list of issues in the city of Amman which are obtained from the semi-structured interviews based on the same social, economic, environment and institutional classifications.

**TABLE 6.2 THE LIST OF ISSUES IN THE CITY OF AMMAN OBTAINED FROM SEMI-STRUCTURED INTERVIEWS.**

<b>Social challenges</b>	<b>Economic challenges</b>	<b>Environmental challenges</b>	<b>Institutional challenges</b>
Sudden increase of population.	Lack of unstable economic system.	Factories in populated areas.	Lack of capacity of services for a large population.
Increase in the number of economic refugees.	Impact on the labor market by cheap labor from refugees.	Lack of designed industrial zones.	Weakness in coordination between institutions.
Increase in the number of Syrian refugees.	Centralized government in Amman.	Pollution from Sahaab industrial zone.	lack of communication between public institutions in Amman.
Lack of effective transportation system.	Lack of fair distribution of economic resources.	Lack of factories waste management.	Lack of trust between people and public institutions.
Congestion.	infrastructure failure.	Increase the level of drought.	Lack of updated data for the GAM.
Danger of terrorism.	Increase of energy cost.	Increase the level of heatwaves.	Lack of proper measurement of the performance of Amman.
changing in the demographics.		Increase the level of surface floods.	
low-quality services in health.			

<p>low-quality services in education.</p> <p>Increase urbanization.</p> <p>lack of affordable houses.</p> <p>lack of diverse livelihood opportunities.</p> <p>Lack of accurate number of migrants.</p> <p>Social connection-based job opportunities rather than skills-based.</p> <p>Interference of socialization in every aspect of our life.</p> <p>lack of parks for children.</p>	<p>lack of natural resources.</p> <p>limited access to financial assistance.</p> <p>Unemployment rate.</p> <p>lack of proper support from the private sector.</p> <p>Increase the level of recession.</p> <p>high taxation rate.</p> <p>Low wages.</p> <p>High fuel consumption.</p> <p>Increase living cost.</p> <p>Lack of economic future planning.</p>	<p>lack of green spaces</p> <p>Lack of green infrastructure.</p> <p>Increase the level of Carbon dioxide (CO2).</p> <p>Increase the level of water shortage.</p>	<p>Slow implementation of projects.</p> <p>Lack of agreement on bidding management of projects.</p> <p>Corruption.</p> <p>Mediation and favouritism.</p> <p>lack of prioritizing the use of financial support.</p> <p>Poor public services.</p> <p>Lack of future planning</p> <p>Lack of long-time planning.</p> <p>Bureaucracy in decisions.</p>
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<p>Poor quality services in public schools.</p> <p>favouritism in health care in the public hospitals.</p> <p>Lack of proper roads designs.</p> <p>Lack of public awareness of the concept of sustainability.</p> <p>Lack of publicity of the concept of sustainability.</p> <p>Lack of affordable health insurance.</p> <p>Lack of effective rainwater drainage systems.</p> <p>Lack of an effective sewage system.</p> <p>Lack of special research centres for sustainability.</p>	<p>the negative economic impact of some of the neighboring countries on Amman.</p>		<p>slow administrative procedures</p> <p>the complexity in public regulations.</p> <p>Lack of modern methods of conducting businesses.</p> <p>Lack of productivity.</p> <p>Lack of job satisfaction.</p>
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Lack of feeling of belonging to the city.			
Increase of frustration on people.			
Increase poverty rate.			
Lack of sidewalks.			
Lack of pedestrian areas.			
Increase crime rate.			

**SOURCE: AUTHOR 2019**

### **6.2.3 Results of the analysis of the focus-group discussions regarding challenges in the city of Amman/Jordan:**

By analyzing the transcribed focus-group discussions through using the NVIVO software analysis approach. The following table 6.3 shows the list of issues in the city of Amman which is obtained from the focus-group discussion based on the social, economic, environmental, and institutional classifications.

**TABKE 6.3 THE LIST OF ISSUES IN THE CITY OF AMMAN OBTAINED FROM THE FOCUS GROUP DISCUSSION**

<b>Social challenges</b>	<b>Economic challenges</b>	<b>Environmental challenges</b>	<b>Institutional challenges</b>
Sudden increase in the number of populations.	Lack of economic development.	Air pollution from Sahaab industrial city.	Lack of modern procedures in the government institutions.
Lack of infrastructure.	Lack of stable economy.	Lack of proper waste- water management in Sahaab industrial city.	Lack of E-services.
Lack of proper roads.	Disparities in economic service delivery between areas in Amman.	Increase in the number of the population with cancer diseases due to the Sahaab city.	Slow administrative procedures.
Lack of sewage system.	Increase of living cost.	Mixing of waste-water with drinking groundwater.	Mediation and favouritism.
Lack of variety of public transportation.	Increase of unemployment rate.	Lack of assessment to Sahaab factories.	Lack of documents tracking system.
Lack of awareness of change.	Lack of determining the prices of the properties.		Lack of job satisfaction.
Lack of acceptance of competition between companies.			Corruption in the public institutions.
Delayed in the implementation of			



<p>the Fast Bus project.</p> <p>Lack of social equity between east and west of Amman.</p> <p>Lack of social justice.</p> <p>Poor health services in public hospitals.</p> <p>Poor educational services in public schools.</p> <p>Lack of enough class rooms in public schools.</p> <p>Lack of property standards.</p> <p>Lack of awareness of how to access the internet.</p>		<p>Lack of multiple landfills.</p> <p>Lack of recycling stations.</p> <p>Lack of recycling bins.</p>	<p>Lack of observation in public institutions.</p> <p>Lack of evaluation in public institutions.</p> <p>lack of proper system in public health institution.</p> <p>lack of employees work commitment.</p> <p>Lack of evaluation and assessment of the quality of work in public sector.</p> <p>Lack of future plans.</p> <p>Lack of publications of sustainability projects.</p>
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**SOURCE: AUTHOR 2019**

**6.3 Triangulations of the data collected from three sources  
(Literature/documents, Semi-structured interviews, Focus-group  
discussion).**

Through the use of the triangulation method which is explained in the previous chapter (chapter 5, Benghazi case), a unified list of the issues and challenges of the city of Amman is revealed in the following table 6.4:

**TABLE 6.4 THE UNIFIED LIST OF THE ISSUES AND CHALLENGES OF THE CITY OF AMMAN**

<b>Social challenges</b>	<b>Economic challenges</b>	<b>Environmental challenges</b>	<b>Institutional challenges</b>
Tribalism interfering with the government.	Number of people in Jordan live in extreme poverty.	Increased the number of automobiles ownership.	Lack of clear policies towards prices of energy resources.
Increase the number of populations.	Inability to borrow financial support from international community.	Increase noise pollution.	Serious weaknesses and vulnerabilities in public institutions.
Sudden increase in the number of refugees and migrants.	Government budget difficulty.	Lack of accurate traffic noise data and information.	Low job satisfaction for employees.
Lack of awareness of the importance of repaying the national dept.	Increase unemployment rate.	continues imbalance in the population-water resources.	Poor working conditions.
	Weak economic growth.		Lack of skilled labour.

<p>Increase the demand of services and infrastructure.</p> <p>Lack of enough public housing projects.</p> <p>Changes and adds which transform the architectural characteristics.</p> <p>Lack of commitment to original designs of contraction projects.</p> <p>Lack of clear street network planning.</p> <p>Lack of matching between widths of streets and the size of the projects.</p> <p>lack of open space.</p> <p>lack of open space and the absence of playgrounds for children.</p>	<p>The increase in the number of Syrian refugees which affected economic growth.</p> <p>Closing the export routes to Iraq and Syria.</p> <p>Increase in energy consumption.</p> <p>Increase of ownership of electrical devices per household.</p> <p>Instability of tax rates.</p> <p>Lack of transparency in pricing policy.</p> <p>Increase of the population moving to urban areas.</p>	<p>Lack of manners and attitudes to deal with water shortage.</p> <p>Loss of large amount of rain water due to pollution.</p> <p>Poor quality of resources of energy.</p> <p>inefficient ways of using energy resources.</p> <p>Increase of CO2 emissions.</p> <p>The use of unhealthy resource for house heating.</p> <p>Increase the percentage of metals in the street's dust.</p>	<p>Poor logistical systems.</p> <p>Nepotism and Wasta" or favour-system.</p> <p>Poor land-use regulations.</p> <p>Lack of capacity of services for a large population.</p> <p>Weakness in coordination between institutions.</p> <p>lack of communication between public institutions in Amman.</p> <p>Lack of trust between people and public institutions.</p> <p>Lack of updated data for the GAM.</p>
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Absence of a civic centre for public use.	Lack of accurate data on work related issues.	Increase the volume of waste and its composition.	Lack of proper measurement of the performance of Amman.
Absence of building regulations.	Lack data on migrant expenditure and money transfer.	Lack of suitable equipment for rubbish collecting.	Slow implementation of projects.
Increase the large number of public buildings constructed near housing projects.	Lack of unstable economic system.	Lack of financial support for rubbish collecting.	Lack of agreement on bidding management of projects.
lack of compliance with the original designs of buildings and projects.	Impact on the labor market by cheap labor from refugees.	Lack of trained manpower for rubbish collection.	Corruption.
Lack of clear street network planning.	Centralized government in Amman.	lack of a comprehensive system for solid waste collection, recycling, disposal, and treatment.	Mediation and favouritism.
sudden increase of population.	Lack of fair distribution of economic resources.	lack of a comprehensive system for solid waste collection, recycling, disposal, and treatment.	lack of prioritizing the use of financial support.
Increase in the number of economic refugees.	infrastructure failure.	Increase noise pollution.	Poor public services.
Increase in the number of Syrian refugees.	Increase of energy cost.		Lack of future planning
			Lack of long-time planning.

Lack of effective transportation system.	lack of natural resources.	Lack of engineered landfill sanitary.	Bureaucracy in decisions.
Congestion.	limited access to financial assistance.	Increase pressure on the country's fragile water supply.	Slow administrative procedures
Danger of terrorism.	Unemployment rate.	Factories in populated areas.	The complexity in public regulations.
Changing in the demographics.	lack of proper support from the privet sector.	Lack of designed industrial zones.	Lack of modern methods of conducting businesses.
low-quality services in health.	Increase the level of recession.	Increase the level of water shortage.	Lack of productivity.
low-quality services in education.	high taxation rate.	Pollution from Sahaab industrial zone.	Lack of job satisfaction.
Increase urbanization.	Low wages.	Lack of factories waste management.	Lack of modern procedures in the government institutions.
lack of affordable houses.	High fuel consumption.		Lack of E-services.
lack of diverse livelihood opportunities.	Increase living cost.		Slow administrative procedures.
Lack of accurate number of migrants.	Lack of economic future planning.		Mediation and favouritism.

<p>Social connection-based job opportunities rather than skills-based.</p> <p>Interference of socialization in every aspect of our life.</p> <p>lack of parks for children.</p> <p>Poor quality services in public schools.</p> <p>favouritism in health care in the public hospitals.</p> <p>Lack of proper roads designs.</p> <p>Lack of public awareness of the concept of sustainability.</p> <p>Lack of publicity of the concept of sustainability.</p>	<p>The negative economic impact of some of the neighboring countries on Amman.</p> <p>Lack of economic development.</p> <p>Lack of stable economy.</p> <p>Disparities in economic service delivery between areas in Amman.</p> <p>Increase of living cost.</p> <p>Increase of unemployment rate.</p> <p>Lack of determining the prices of the properties.</p>	<p>Increase the level of drought.</p> <p>Increase the level of heatwaves.</p> <p>Increase the level of surface floods.</p> <p>lack of green spaces</p> <p>lack of green infrastructure.</p> <p>Increase the level of Carbon dioxide (CO2).</p> <p>Air pollution from Sahaab industrial city.</p> <p>Lack of proper waste- water management in Sahaab industrial city.</p>	<p>Lack of documents tracking system.</p> <p>Lack of job satisfaction.</p> <p>Corruption in the public institutions.</p> <p>Lack of observation in public institutions.</p> <p>Lack of evaluation in public institutions.</p> <p>Lack of proper system in public health institution.</p> <p>lack of employees work commitment.</p> <p>Lack of evaluation and assessment of the quality of work in public sector.</p> <p>Lack of future plans.</p> <p>Lack of publications of sustainability projects.</p>
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<p>Lack of affordable health insurance.</p> <p>Lack of effective rainwater drainage systems.</p> <p>Lack of an effective sewage system.</p> <p>Lack of special research centres for sustainability.</p> <p>Lack of feeling of belonging to the city.</p> <p>increase of frustration on people.</p> <p>increase poverty rate.</p> <p>Lack of sidewalks.</p> <p>lack of pedestrian areas.</p> <p>Increase crime rate.</p>		<p>Increase in the number of the population with cancer diseases due to the Sahaab city.</p> <p>Mixing of waste-water with drinking groundwater.</p> <p>Lack of assessment to Sahaab factories.</p> <p>Lack of multiple landfills.</p> <p>Lack of recycling stations.</p> <p>Lack of recycling bins.</p>	
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<p>Sudden increase in the number of populations.</p> <p>Lack of infrastructure.</p> <p>Lack of proper roads.</p> <p>Lack of sewage system.</p> <p>Lack of variety of public transportation.</p> <p>Lack of awareness of change.</p> <p>Lack of acceptance of competition.</p> <p>Delayed in the implementation of the Fast Bus project.</p> <p>Lack of social equity between east and west of Amman.</p>			
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Lack of social justice.			
Poor health services in public hospitals.			
Poor educational services in public schools.			
Lack of enough class rooms in public schools.			
Lack of property standards.			
Lack of awareness of how to access the internet.			

**SOURCE: AUTHOR 2019**

Furthermore, the implementation of the second step of the ALISA framework which is shown in the previous chapter section 5.3 (Objective formation), as well as applying the Inverse Problem Method, resulted the following table 6.5. The following table illustrates the objectives list which have been developed through the analysis of the issues and problems of the city of Amman.

**TABLE 6.5 THE OBJECTIVES LIST DEVELOPED THROUGH THE ANALYSIS OF THE ISSUES AND PROBLEMS OF THE CITY OF AMMAN**

<b>Issues</b>	<b>Objectives</b>
<b>social</b>	
<p>Increase the number of populations.</p> <p>Sudden increase in the number of refugees and migrants.</p> <p>sudden increase of population.</p> <p>Increase in the number of economic refugees.</p> <p>Increase in the number of Syrian refugees.</p> <p>Lack of accurate number of migrants.</p>	<p>To control the sudden increase of the number of populations.</p>
<p>Tribalism interfering with the government.</p> <p>Interference of socialization in every aspect of our life.</p>	<p>To prevent interference of tribes with the governing system.</p>
<p>Increase urbanization.</p> <p>Increase the demand of services and infrastructure.</p> <p>Lack of infrastructure.</p>	<p>To cover public demand on services and infrastructure.</p>

<p>Lack of enough public housing projects. lack of affordable houses.</p> <p>Lack of commitment to original designs of contraction projects. Changes and adds which transform the architectural characteristics. Absence of building regulations. Lack of property standards. lack of compliance with the original designs of buildings and projects. Lack of matching between widths of streets and the size of the projects.</p> <p>lack of open space. Increase the large number of public buildings constructed near housing projects. lack of open space and the absence of</p>	<p>To increase public houses projects.</p> <p>To improve commitment regulations to the original designs of construction projects.</p> <p>To improve matching criteria between street widths and construction projects.</p> <p>To create more open spaces.</p> <p>To build playgrounds for children.</p> <p>To improve roads designs.</p> <p>To improve drainage and sewage networks.</p> <p>To improve sidewalks for pedestrians.</p>
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<p>playgrounds for children.</p> <p>lack of parks for children.</p> <p>Lack of proper roads.</p> <p>Lack of clear street network planning.</p> <p>Lack of proper roads designs</p> <p>Lack of effective rainwater drainage systems.</p> <p>Lack of an effective sewage system.</p> <p>Lack of sidewalks.</p> <p>lack of pedestrian areas.</p>	
<p>Lack of awareness of the importance of repaying the national dept.</p> <p>Lack of public awareness of the concept of sustainability.</p> <p>Lack of awareness of change.</p>	<p>To increase the awareness of repaying national dept.</p> <p>To increase awareness of the concept of sustainability.</p> <p>To increase the publicity of the concept of sustainability.</p> <p>To raise the awareness of belonging.</p>

<p>Lack of publicity of the concept of sustainability.</p> <p>Lack of feeling of belonging to the city.</p> <p>Increase of frustration on people.</p> <p>Lack of awareness of how to access the internet.</p> <p>Lack of acceptance of competition between companies.</p>	<p>To increase people's morale.</p> <p>To increase awareness of using the internet.</p> <p>To raise the concept of competition.</p>
<p>Poor quality services in public schools.</p> <p>low-quality services in education.</p> <p>Poor educational services in public schools.</p> <p>Lack of enough class rooms in public schools</p>	<p>To improve services in public schools.</p> <p>To improve education level in public schools.</p> <p>To build enough class-rooms in public schools.</p>
<p>favouritism in health care in the public hospitals.</p> <p>Lack of affordable health insurance.</p>	<p>To tackle favoritism in health care in public hospitals.</p> <p>To reduce prices of health insurance.</p> <p>To improve health services.</p> <p>To improve health services in public hospitals.</p>

<p>low-quality services in health.</p> <p>Poor health services in public hospitals.</p>	
<p>Increase crime rate.</p> <p>increase poverty rate.</p> <p>Lack of social equity between east and west of Amman.</p> <p>Lack of social justice.</p>	<p>To tackle the increase in crime rate.</p> <p>To reduce poverty rate.</p> <p>To provide social equity between east and west of Amman.</p> <p>To provide social justice.</p>
<p>Lack of effective transportation system.</p> <p>Congestion.</p> <p>Delayed in the implementation of the Fast Bus project.</p> <p>Lack of variety of public transportation.</p>	<p>To improve transportation system.</p> <p>To solve the issue of congestion.</p> <p>To solve the issue of delays in the Fast Bus project.</p> <p>To provide a variety of public transportation facilities.</p>
<p>Lack of special research centres for sustainability.</p> <p>Absence of a civic centre for public use.</p>	<p>To build sustainability research centres.</p> <p>To build more civic centres for the public.</p>
	<p>To increase the livelihood opportunities.</p>

Lack of diverse livelihood opportunities.	
Danger of terrorism. Changing in the demographics.	To tackle the issue of terrorism. To organize demographic distribution.
<b>Economic</b>	
Inability to borrow financial support from international community. Limited access to financial assistance.  Government budget difficulty. Weak economic growth. Lack of unstable economic system. Lack of economic development. Lack of stable economy.	To enable borrowing from the international community.  To create government budget sources. To improve the economic development.   To find solutions with the border's issues.   To improve economic resources distribution.

<p>Closing the export routes to Iraq and Syria.</p> <p>The negative economic impact of some of the neighboring countries on Amman.</p> <p>Lack of fair distribution of economic resources.</p>	
<p>Number of people in Jordan live in extreme poverty.</p> <p>Increase unemployment rate.</p> <p>Unemployment rate.</p> <p>Social connection-based job opportunities rather than skills-based.</p> <p>The increase in the number of Syrian refugees which affected economic growth.</p> <p>Impact on the labor market by cheap labor from refugees.</p>	<p>To tackle poverty rate.</p> <p>To reduce unemployment rate.</p> <p>To improve principles for job opportunities.</p> <p>To solve economic issues related to Syrian refugees.</p> <p>To improve the distribution of the populations.</p> <p>To improve the economic development.</p> <p>To improve wages rate.</p>



<p>Increase of the population moving to urban areas.</p> <p>Increase the level of recession.</p> <p>lack of proper support from the private sector.</p> <p>Low wages.</p> <p>Increase living cost.</p> <p>Increase of living cost.</p>	<p>To improve stabilization of living costs.</p>
<p>Increase in energy consumption.</p> <p>Increase of energy cost.</p> <p>Increase of ownership of electrical devices per household.</p> <p>High fuel consumption.</p> <p>Lack of accurate data on work related issues.</p> <p>Lack data on migrant expenditure and money transfer.</p> <p>Lack of natural resources.</p>	<p>To provide energy consumption needs</p> <p>To improve fuel sources.</p> <p>To improve databases.</p> <p>To develop renewable resources.</p>

<p>High taxation rate. Instability of tax rates. Lack of determining the prices of the properties. Lack of transparency in pricing policy.</p>	<p>To reduce taxation rate. To stabilize tax rate. To stabilize properties prices. To improve transparency of pricing policies.</p>
<p>Disparities in economic service delivery between areas in Amman. Lack of economic future planning. infrastructure failure. Centralized government in Amman</p>	<p>To improve distribution of economic services between all Amman areas. To develop future economic plans. To improve the infrastructure. To decentralize the government</p>
<b>Environment</b>	
<p>Increased the number of automobiles ownership.  Increase noise pollution.</p>	<p>To control the increase in the number of automobiles.  To reduce noise pollution.  To improve database of noise pollution.</p>

<p>Lack of accurate traffic noise data and information.</p> <p>Increase of CO2 emissions.</p> <p>Increase the level of Carbon dioxide (CO2).</p>	<p>To reduce the level of (CO2).</p>
<p>Lack of manners and attitudes to deal with water shortage.</p> <p>Loss of large amount of rain water due to pollution.</p> <p>Continues imbalance in the population-water resources.</p> <p>Increase pressure on the country's fragile water supply.</p> <p>Increase the level of water shortage.</p> <p>Mixing of waste-water with drinking groundwater.</p> <p>Poor quality of resources of energy.</p> <p>Inefficient ways of using energy resources.</p>	<p>To raise awareness of the danger of water shortage.</p> <p>To improve rain-water usage.</p> <p>To improve water resources distribution.</p> <p>To develop renewable water resource.</p> <p>To improve the level of water shortage.</p> <p>To improve water treatment stations.</p> <p>To improve resources of energy.</p> <p>To improve usage of energy resources.</p> <p>To improve house heating systems.</p>

<p>The use of unhealthy resource for house heating</p>	
<p>Increase the volume of waste and its composition.  Lack of suitable equipment for rubbish collecting.  Lack of financial support for rubbish collecting.  Lack of trained manpower for rubbish collection.  lack of a comprehensive system for solid waste collection, recycling, disposal, and treatment.  Lack of engineered landfill sanitary.  Lack of multiple landfills.  Lack of recycling stations.  Lack of recycling bins.</p>	<p>To reduce the volume of waste composition.  To improve waste collecting equipment.  To increase financial support for waste collecting.  To train manpower for waste collecting.  To improve waste management.    To develop landfill sanitary.    To build recycling stations.  To provide recycling bins.</p>
<p>Air pollution from Sahaab industrial city.</p>	<p>To improve industries air filters.  To improve industries waste-water management.</p>

<p>Lack of proper waste-water management in Sahaab industrial city.</p> <p>Increase in the number of the population with cancer diseases due to the Sahaab city.</p> <p>Lack of assessment to Sahaab factories.</p> <p>Pollution from Sahaab industrial zone.</p> <p>Lack of factories waste management.</p> <p>Factories in populated areas.</p> <p>Lack of designed industrial zones.</p>	<p>To tackle causes of cancer diseases.</p> <p>To improve assessment of Sahaab factories.</p> <p>To reduce pollution from Sahaab industrial zone.</p> <p>To improve factories waste management.</p> <p>To replace factories to a less populated areas.</p> <p>To develop industrial zones.</p>
<p>Increase the level of drought.</p> <p>Increase the level of heatwaves.</p> <p>Increase the level of surface floods.</p> <p>Increase the percentage of metals in the street's dust.</p>	<p>To reduce level of drought.</p> <p>To reduce level of heatwaves.</p> <p>To reduce level of surface floods.</p> <p>To reduce percentage of street's dust.</p>
<p>Lack of green spaces</p> <p>Lack of green infrastructure.</p>	<p>To increase the level of green spaces.</p> <p>To improve infrastructure principles.</p>

<b>Institutional</b>	
<p>Low job satisfaction for employees.</p> <p>Lack of job satisfaction.</p> <p>Lack of job satisfaction.</p> <p>Poor working conditions.</p> <p>Lack of skilled labour.</p> <p>Lack of productivity.</p> <p>Lack of employees work commitment.</p>	<p>To improve level of job satisfaction.</p> <p>To improve working conditions.</p> <p>To improve labour skills.</p> <p>To improve level of productivity.</p> <p>To improve level of work commitment.</p>
<p>Nepotism and Wasta” or favour-system.</p> <p>Mediation and favouritism.</p> <p>Mediation and favouritism.</p>	<p>To tackle nepotism, mediation and favoritism.</p>
<p>Serious weaknesses and vulnerabilities in public institutions.</p> <p>Poor logistical systems.</p> <p>Weakness in coordination between institutions.</p> <p>Lack of updated data for the GAM.</p>	<p>To strengthen public institutions.</p> <p>To improve logistical system.</p> <p>To improve coordination between institutions.</p> <p>To develop database for the GAM.</p>

<p>Lack of communication between public institutions in Amman.</p>	<p>To develop long-term plans.</p>
<p>Lack of future planning.</p>	<p>To reduce bureaucracy in decisions.</p>
<p>Lack of long-time planning.</p>	<p>To tackle corruption in public institutions.</p>
<p>Lack of future plans.</p>	<p>To improve observation, evaluation and assessment in public institutions.</p>
<p>Bureaucracy in decisions.</p>	
<p>Corruption in the public institutions.</p>	<p>To prioritize financial expenditure.</p>
<p>Lack of observation in public institutions.</p>	<p>To improve level of trust between people and institutions.</p>
<p>Lack of evaluation in public institutions.</p>	<p>To improve the speed of project implementation.</p>
<p>Lack of evaluation and assessment of the quality of work in public sector.</p>	<p>To improve project bidding regulations.</p>
<p>Lack of proper measurement of the performance of Amman.</p>	
<p>Lack of prioritizing the use of financial support.</p>	
<p>Lack of trust between people and public institutions.</p>	

<p>Slow implementation of projects.</p> <p>Lack of agreement on bidding management of projects.</p>	
<p>Lack of capacity of services for a large population.</p> <p>Poor public services.</p> <p>Lack of proper system in public health institution.</p> <p>Lack of modern procedures in the government institutions.</p> <p>Lack of E-services.</p> <p>Lack of documents tracking system</p> <p>Slow administrative procedures.</p> <p>The complexity in public regulations.</p> <p>Lack of modern methods of conducting businesses.</p>	<p>To improve public services.</p> <p>To improve public health services.</p> <p>To improve the government's institution's performance.</p> <p>To provide E-government services.</p> <p>To provide a government document tracking system.</p> <p>To improve administrative performance.</p> <p>To ease public regulations.</p> <p>To improve business regulations.</p>
<p>Lack of clear policies towards prices of energy resources.</p> <p>Poor land-use regulations.</p>	<p>To improve energy prices policies.</p> <p>To improve land-use regulations.</p>



Lack of publications of sustainability projects.	To improve sustainability projects publications.
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**SOURCE: AUTHOR 2019**

#### **6.4 INITIAL LIST OF SUSTAINABILITY INDICATORS FOR THE CITY OF AMMAN:**

The initial list of sustainability indicators for the city of Amman was developed through logical information and procedure which has been supported by consultants and specialists in sustainability and urbanization from the Applied science University in Amman as well as searching through the literature on sustainable development.

Through the implementation of the 3<sup>rd</sup> and 4<sup>th</sup> steps of the ALISA framework shown in chapter 5 section 5.4 and based on the criteria mentioned in chapter 5 section 5.4, three factors (simple, widely credible, and easily understood by the public and policymakers) which were applied in the procedure of the development of sustainability indicators in the city of Amman. Also, by involving the following steps illustrated by Bangkok (2003):

- Think of possible alternative indicators for each concept.
- Objective, and output, without being too restrictive.
- Conduct internal brainstorming sessions.
- Consult stakeholders and other experts.
- Try to borrow from other projects and studies (Bangkok 2003).

A list of 36 proposed sustainability indicators illustrated in the following table 6.6. This list of proposed sustainability indicators is classified based on the UNCSD 2001, which includes four themes of sustainability indicators (social, economic, environmental and institutions).

**TABLE 6.6 THE LIST OF PROPOSED SUSTAINABILITY INDICATORS IN AMMAN**

<b>Indicator</b>	<b>Description</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Social</b>						
The number of populations in Amman.	Improving policies towards the rapid increase of population in Amman.					
Refugees.	Solving issues of refugees in Amman.					
Public services.	Distribution of public services across Amman.					
Public awareness.	Awareness of sustainability, change, belonging and morals.					
Education.	Public schools, universities, research centres and educational services.					
Health care.	Public and private hospitals. Ratio of people who access public hospitals. Quality of health services in public hospitals.					
Security.	Homicide, crime rate and theft crimes.					
Social equity.	Social justice, social equity between West and East of Amman.					
Livelihood opportunities.	People's capabilities, income, and activities required to secure their lives					

Terrorism	Physical attacks against civilians.					
Demographics.	Demographics distribution.					
Poverty rate.	Number of people living below poverty line.					
<b>Economic</b>						
Infrastructure.	Roads, housing projects, sanitation and drinking water systems, streets, sidewalks, sewage networks and bridges.					
Transportation system.	Public buses, taxis, "Fast Bus" project, public parking spaces and traffic congestion.					
Economic development.	Government loans, budgets and economic resources distribution.					
Unemployment rate.	Number of people employed vs number of people unemployed.					
Wages rate.	Equity in wages and economic services distribution.					
Standers of living.	Level of living costs, taxation rate, properties prices and stability of living prices.					
Energy sources.	Energy use. Energy sources such as electricity, gas, petrol and renewable energy resources.					
Data sources.	Improving databases for economic development.					
Communication networks.	Mobile networks. Internet services.					

<b>Environmental</b>						
Air pollution.	Control the number of automobiles, the level of CO2 and reduce noise pollution and street's dust.					
Green spaces.	Playgrounds for children, open spaces and parks.					
Drinking water and sanitation.	Water shortage, drought, heatwaves, and surface floods.					
Waste management.	Landfill and recycling. Public spaces and streets cleaning.					
Industrial pollution.	Sahaab industrial zone waste management.					
Public health.	Improving heating systems, electricity and power resources that affects public health.					
<b>Institutional</b>						
Rule of law.	Commitment to regulations in public services and public institutions.					
Institutional efficiency/ Institutional capacity.	Capacity of institution to meet public demands.					
Corruption.	Nepotism and Wasta" or favour-system.					
Institutional productivity.	Level of job satisfaction, working conditions and work commitment.					

Governing system.	Improving the principles of the government policies and future plans.					
Institutional services.	E-government, and institution's performance and regulations.					
Institutional publications.	Improving institutional future projects publications.					
Transparency.	Transparency in policies and decisions.					
Centralized government.	To decentralized the government in Amman.					

**SOURCE: AUTHOR 2019**

## **6.5 LOCAL COMMUNITY PARTICIPATION.**

In order to ensure that the above initial list of indicators is effective and representative of the local community in the city of Amman, the list was then given and introduced to a number of 100 locals. These people included, doctors, architectures, media journalists, lawyers, teachers, community services members, social media activists, higher education students, sport people and other member of the local community. According to the London Sustainable Development (Report on London's quality of life indicators) (2004) prioritizing sustainability indicators is important for actions. It shows that either the London situation is worse or better than the rest of the cities in the UK (London Sustainable Development 2004).

In addition to that, the procedure of selecting the 100 participants was based on two categories. First the numbers of participants had to be equal between

females and males. Therefore, the questionnaire survey was given to 50 females and 50 males. The choice of the area of the city was based on dividing the city map into two districts, east and west as shown in figure 6.1.

FIGURE 6.1 THE MAP OF AMMAN.



**SOURCE: EDITED BY AUTHOR BASED ON GOOGLE MAP 2019.**

Each participant of the local community in the city of Amman was asked to rank the developed indicators. This ranking was based on the level of their personal perception of the importance of the indicators. By using the Likert scale which gave the participants a range of scale 1 to 5, Where 1 is classified as not important, 2 less important, 3 important, 4 very important, and 5 classified as vital.

Through the implementation of the steps shown in the previous chapter 5 section 5.5 which included conducting a pilot study, preparations of the survey questions, the calculations of the averages and the ranking of the 36 indicators using Excel, table 6.7 shows the results including the averages and ranking of the sustainability indicators in the city of Amman.

**TABLE 6.7 THE RESULTS INCLUDING AVERAGES AND RANKINGS OF THE SUSTAINABILITY INDICATORS IN THE CITY OF AMMAN**

<b>Indicator.</b>	<b>Average</b>	<b>Rank</b>
Health care.	4.34	1
Public services. Standers of living.	4.18	2+3
Livelihood opportunities.	4.17	4
Infrastructure.	4.16	5
Education. Wage rate.	4.14	6+7
Public awareness.	4.11	8
Security. Poverty rate.	4.06	9+10
Unemployment rate.	4.02	11
Social equity. Green spaces. Institutional productivity.	3.98	12+13+14
Transportation system. Corruption. Institutional services.	3.95	15+16+17
Governing system. Transparency.	3.88	18+19
Drinking water and sanitation.	3.87	20
Institutional efficiency/ Institutional capacity.	3.85	21
Public health.	3.84	22
Energy sources. Rule of law.	3.83	23+24
Industrial pollution.	3.81	25
Institutional publications.	3.8	26
Waste management.	3.75	27
Terrorism.	3.72	28
Economic development.	3.71	29
Refugees.	3.67	30
Air pollution.	3.65	31
Communication networks.	3.58	32
Demographics.	3.57	33
Data sources.	3.55	34
The number of populations in Amman.	3.52	35
Centralized government.	3.36	36

**SOURCE: AUTHOR 2019**

The above results are analysed in a comparative manner with the results from the city of Benghazi in the next chapter 7. In addition to that, based on the UNCSO thematic sustainability indicators, the following table 6.8 was developed to illustrate the final list of sustainability indicators for the city of Amman based on institutional and local levels.

**TABLE 6.8 THE FINAL LIST OF SUSTAINABILITY INDICATORS - AMMAN**

INDEX	THEME	SUB-THEME	INDICATOR
Social	Health	Healthcare	Quality of health services and number of people receiving healthcare in public hospitals.
Social	Services	Public services.	Quality of public services and the number of people receiving public services.
Economic	Level of living.	Standers of living.	The ability of people to manage the living costs.
Social.	Level of living.	Livelihood opportunities.	People's capabilities and activities required to secure their lives.
Economic.	Infrastructure.	Infrastructure.	Infrastructure projects including Roads, housing projects, sanitation and drinking water systems, streets, sidewalks, sewage networks and bridges.
Social	Education	Education.	Number of people with access to education and educational services.
Economic	Wages	Wage rate.	Equity in wages.



Social	Level of awareness.	Public awareness.	Awareness of sustainability, change, belonging and morals.
Social	Violence	Security.	Level of homicide, crime rate and theft crimes.
Social	Equity	Poverty rate.	Number of people living below poverty line.
Economic	Equity.	Unemployment rate.	Number of people employed vs number of people unemployed.
Social.	Equality.	Social equity.	Level of social justice, social equity between West and East of Amman.
Environment.	Health.	Green spaces.	Number of playgrounds for children, open spaces and parks.
Institutions.	Governance system	Institutional productivity.	Level of job satisfaction, working conditions and work commitment.
Economic.	Infrastructure.	Transportation system.	Public buses, taxis, "Fast Bus" project, public parking spaces and traffic congestion.
Institutions.	Governance system.	Corruption.	Level of Nepotism and Wasta" or favour-system.
Institutions	Institutional services.	Institutional services.	E-government, and institution's performance and regulations.
Institutions.	Governing system.	Governing system.	Level of the principles of the government policies and future plans.
Institutions.	Government.	Transparency.	Level of transparency in policies and decisions.

Environment.	Health.	Drinking water and sanitation.	Level of access to drinking water and sanitation.
Institutions.	Institutional performance.	Institutional efficiency/ Institutional capacity.	Capacity of institution to meet public demands.
Environment.	Health.	Public health.	Improving heating systems, electricity and power resources that affects public health.
Economic.	Consumption and production.	Energy sources.	Energy use. Energy sources such as electricity, gas, petrol and renewable energy resources.
Institutions.	Rule of law.	Rule of law.	Commitment to regulations in public services and public institutions.
Environment.	Air pollution.	Industrial pollution.	Sahaab industrial zone waste management.
Institutions.	Institutional services.	Institutional publications.	Improving institutional future projects publications.
Environment.	Health.	Waste management.	Landfill and recycling. Public spaces and streets cleaning.
Social.	Security.	Terrorism.	Physical attacks against civilians.
Economic.	Economic system.	Economic development.	Government loans, budgets and economic resources distribution.
Social.	Social conflicts.	Refugees.	Solving issues of refugees in Amman.
Environment.		Air pollution.	

Economic.	Infrastructure.	Communication networks.	Level of effectiveness of mobile networks. Internet services.
Social.	Social conflicts.	Demographics.	Demographics distribution across Amman.
Economic.	Economic system.	Data sources.	Improving databases for economic development.
Social.	Social conflicts.	The number of populations in Amman.	Improving policies towards the rapid increase of population in Amman.
Institutions.	Government system.	Centralized government.	To decentralized the government in Amman.

**SOURCE: AUTHOR 2019**

Furthermore, as mentioned previously in this chapter, when the questionnaire survey was distributed, it was based on a gender level. Therefore, the following tables 6.9 and 6.10 illustrate the ranking of sustainability indicators in the city of Amman based on the context of gender ratio. Also, by finding the gap between the two genders, it is possible to analysis the difference and conditions in policies and institutions. Table 6.9 illustrates the female ranking of the sustainability indicators in the city of Amman.

**TABLE 6.9 THE FEMALE RESPONDENTS' RANKING OF THE SUSTAINABILITY INDICATORS IN THE CITY OF AMMAN**

<b>Indicator.</b>	<b>Average</b>	<b>Rank</b>
Health care.	4.24	1
Livelihood opportunities.	4.16	2
Drinking water and sanitation.	4.12	3
Governing system.	4.06	4
Education. Infrastructure.	4.04	5+6
Standers of living.	4.02	7
Wage rate.	4	8
Public services. Public awareness.	3.98	9+10
Security.	3.96	11
Poverty rate.	3.94	12
Institutional productivity.	3.9	13
Rule of law.	3.88	14
Social equity.	3.86	15
Unemployment rate.	3.84	16
Institutional services.	3.82	17
Corruption.	3.78	18
Terrorism. Transportation system. Institutional publications.	3.76	19+20+21
Demographics. Transparency. Centralized government.	3.72	22+23+24
Refugees. Air pollution. Institutional efficiency/ Institutional capacity.	3.7	25+26+27
Waste management.	3.68	28
Industrial pollution. Public health.	3.66	29+30
Economic development. Energy sources.	3.64	31+32
The number of populations in Amman.	3.62	33
Green spaces.	3.58	34
Data sources.	3.54	35
Communication networks.	3.38	36

**SOURCE: AUTHOR 2019**

Table 6.10 illustrates the male respondents' ranking of the sustainability indicators in the city of Amman.

<b>Indicator.</b>	<b>Average</b>	<b>Rank</b>
Health care.	4.44	1
Public services.	4.38	2
Standers of living.	4.34	3
Infrastructure. Wage rate.	4.28	4+5
Public awareness. Education.	4.24	6+7
Unemployment rate.	4.2	8
Livelihood opportunities. Poverty rate.	4.18	9+10
Security.	4.16	11
Transportation system. Institutional publications.	4.14	12+13
Social equity.	4.1	14
Waste management.	4.06	15
Centralized government.	4.04	16
Energy sources.	4.02	17
Institutional productivity.	4	18
Public health. Institutional efficiency/ Institutional capacity.	3.96	19+20
Institutional services.	3.94	21
Corruption.	3.92	22
Governing system.	3.9	23
Transparency.	3.88	24
Drinking water and sanitation. Industrial pollution.	3.84	25+26
Rule of law.	3.8	27
Economic development.	3.78	28
Green spaces.	3.72	29
Terrorism	3.68	30
Refugees.	3.64	31
Data sources.	3.56	32
Air pollution.	3.46	33
The number of populations in Amman. Demographics.	3.42	34+35
Communication networks.	3.34	36

**SOURCE: AUTHOR 2019**

## **6.6 SUMMARY:**

This chapter has illustrated the results of the implementation of the five steps of the ALISA methodological framework in the city of Amman, Jordan. The first step issues-clarification aimed to identify the main issues and challenges of the city from three sources; documentary sources, semi-structured interviews, and focus-group discussions. The methodology effectively gathered challenges in the city of Amman at four pillars, social, economic, environmental, and institutions. Throughout the use of multiple sources of information and then triangulating the data collected, the chapter positively illustrates accurate and alternative clarifications of the issues of Amman. The use of the triangulation method limits personal and methodological biases and enhances a study's generalizability. It also opens the way for richer and potentially more valid clarifications and understanding of the research (Decrop 1999).

Furthermore, the set of indicators included 12 social sustainability indicators, 9 economical sustainability indicators, 6 environmental sustainability indicators, and 9 institutional sustainability indicators.

Consequently, the developed list of sustainability indicators was introduced to the public to rank. By dividing the geographical map of the city into two districts, (see section 6.5) the ranking procedure was conducted with the participation of 100 citizens from the city of Amman. This was then divided into two equal groups of 50, which were categorized on gender.

After the procedure of ranking, a final of three sets of indicators (male, female and general) were developed based on the concept of priority. This chapter has illustrated the ability, capability, and practicality of the use of the ALISA methodological framework concerning the city of Amman to develop sustainability indicators based on four dimensions (social, economic, environmental, and institutional) and at two levels (institutional and local). These results are explained, compared, and discussed in the following chapter 7.

## **CHAPTER 7**

### **COMPARATIVE ANALYSIS BETWEEN THE CASES OF BENGHAZI AND AMMAN.**

#### **7.1 INTRODUCTION:**

This chapter discusses and analyzes the results of the implementation of the ALISA methodological framework which was implemented in the city of Benghazi, Libya, and Amman, Jordan. In addition to that, the final results of the development of the sustainability indicators lists and the information collected during the interviews and group discussions will be analyzed in a comparative manner between the two cases as well as comparing the findings with previous studies. This chapter will also discuss the effectiveness of ALISA outputs by using the SWOT (Strength, Weaknesses, Opportunities and Threats) analysis approach.

#### **7.2 COMPARISON OF THE FINDINGS IN THE TWO CITIES USING THE THREE TECHNIQUES:**

The use of the three different methods (literature, semi-structured interview, and focus-group discussion) to collect the issues and challenges in the two cities, gave the possibility to compare which method created the richest amount of information. However, results in the two cases are contrasted.

In addition to that, when observing the case of Benghazi, the results show that the richest data was collected through the use of focus-group discussions. On the other hand, when observing the case of Amman, it is more or less that the semi-structured interviews obtained the richest amount of data collected except the environmental issues which had the highest level of data obtained by literature.

According to Bowling (2014), when researchers aim to find information regarding a topic in which only little is known, or it is too complex or sensitive for the development of qualitative data, then observational methods, interviews, and focus-group discussions are the most effective ways (Bowling 2014). Bowling (2014) also argues that focus-groups work well and provide the researcher with the richest information in relation to public views (Bowling 2014).

In addition to that, Bloor and Wood (2006) argue that “semi-structured individual interview gives the opportunity to the respondents to tell their own words” (Bloor and Wood 2006). In addition to that, interviews and focus-group discussions provide the analysis of the two cases, an effective method of gathering detailed issues and views of the cities of Benghazi and Amman.

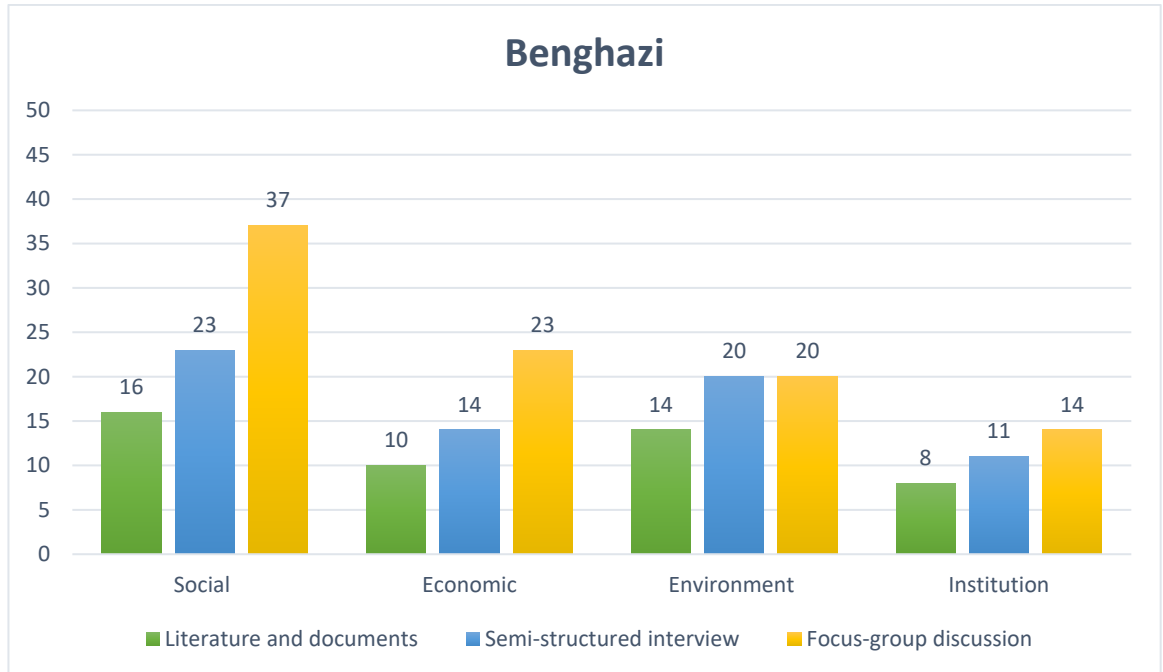
On the other hand, the level of data collected from literature and documents sources was the lowest in the case of Benghazi. Even though using literature as a source of information would have provided the advantages of low cost and ease of access, the availability of the information about sustainability challenges in Libya are limited and incomplete. This is due to the limited number of literature available about the city of Benghazi

Furthermore, due to the availability of literature and documents about challenges in the city of Amman, the level of data obtained from documents is higher than the data obtained from the focus-group discussions.

Figures 7.1 and 7.2 illustrate the level differences of data obtained by literature, semi-structured interviews and focus-group discussions in the city of Benghazi and Amman. Also, it is noticeable that in the two cases, social challenges were the most frequently mentioned among the rest of the challenges. This indicates that in terms of reaching the goal of sustainability in the city of Benghazi and Amman, a significant priority must be given to the social challenges.

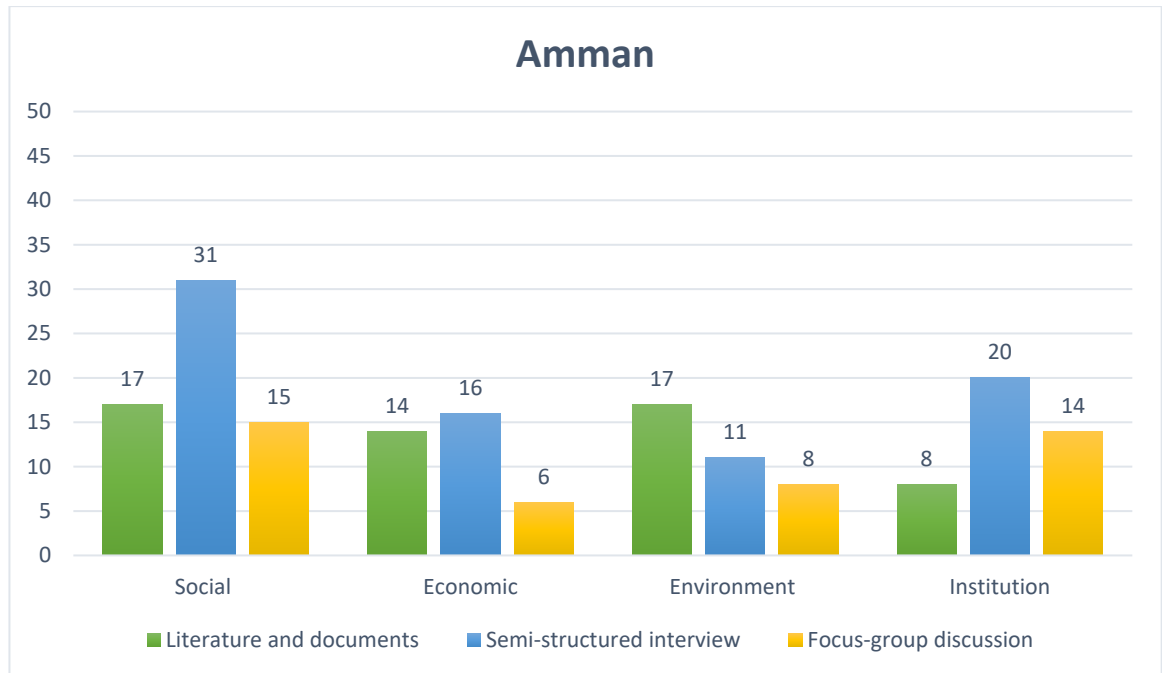


**FIGURE 7.1 THE LEVEL DIFFERENCES OF DATA OBTAINED BY THE LITERATURE, SEMI-STRUCTURED INTERVIEWS AND FOCUS GROUP DISCUSSIONS IN THE CITY OF BENGHAZI**



Source: Aothur 2019

**FIGURE 7.2 THE LEVEL DIFFERENCES OF DATA OBTAINED BY THE LITERATURE, SEMI-STRUCTURED INTERVIEWS AND FOCUS GROUP DISCUSSIONS IN THE CITY OF BENGHAZI**



Source: Author 2019

### **7.3 COMPARISON OF THE TWO INDICATORS (CORRUPTION, DEMOGRAPHICS):**

#### **7.3.1 THE INDICATOR CORRUPTION:**

The categorization of the challenges of sustainability in the two cities was based on the four pillars of sustainability (social, economic, environment and institution) to highlight the nature of each sustainability challenge. However, two of the categories of the sustainability challenges in the city of Benghazi were different from the category in the city of Amman. These are corruption and demographic.

Despite the similarities in some of the indicators between Benghazi and Amman, the category which emphasizes them into the four pillars of sustainability was

different. This is due to the information that was given by participants who participated in the interviews and group discussions.

Consequently, the indicator of (corruption) in the city Benghazi ranked 6<sup>th</sup> and was categorized as an economic indicator. According to the Benghazi's Municipality economic consultant, the main challenge for the economic development in the city of Benghazi is corruption.

“Economic development. It has always been a government driven, and this doesn't work with the global world anymore. It never worked anyway, and that emphasize that corruption is a big problem of ease of doing business in Libya. Corruption in the economic system is the main thing” (Benghazi's Municipality economic consultant).

In addition to that, the Head of Architecture Department at the University of Benghazi was asked if corruption was a main challenge for the city of Benghazi. The answer was as follows:

“Yes, indeed it is. However, the main sector affected by corruption in the city of Benghazi is the economic sector” (Head of Architecture department at the University of Benghazi).

Furthermore, when asking the chief of The Meraissa Harbor and Smart Village Project about the economic benefit of the project to the city and what is the procedure that the Libyan government has taken towards that:

“The government made a decision that no one can entry the country without a licence that allows him/her to work in the Meraissa project, and to have this licence you need visa and other documents. But they had to be a little flexible, because with too much pressure, people couldn't get any work done and people started to find way to corruption which is always been a challenge in our economic system” (Chief of Meraissa Harbor and Smart Village Project).

On the other hand, the case of Amman was slightly different in terms of categorizing the indicator (corruption). Even though the indicator was ranked as 16<sup>th</sup> by the public in Amman, the elites of the city of Amman that were interviewed classified the indicator corruption as an “institutional issue only”. According to the (Head of Environmental Engineering Department at the Applied Science University) “there is corruption in Amman, but you can say it is middle to a low level and it is manageable by special authorities”.

In addition to that, the Dean of the Engineering Department at Zaytoona University and a city planning consultant at the Greater Amman Municipality argues that corruption is not a main challenge at the moment and the level of corruption is not at a worrying point.

When asking if corruption was a major challenge in Amman or is it controllable? The answer was “No, it is not a major problem, as I said mainly Amman has the barrier of economy, and also the problem of transportation which needs an urgent and economical solution or I would say we need a smart solution to this issue” (Dean of the Engineering Department at Zaytoona University and a city planning consultant at the Greater Amman Municipality).

“As any other country we have the challenge of corruption within our system. One of our main challenges in the public sector is the lack of observation and also lack of evaluation”. As any other country we have the challenge of corruption. One of our main challenges in the public sector is the lack of observation and also lack of evaluation. When an employee is given a job, he/she doesn't care about the quality of service provided as long as he/she receives the monthly wage. Therefore, there is a lack of both evaluation and observation (UN representative in Amman).

According to The United Nations (2007) report in Indicators of Sustainable Development, corruption is classified as a governance indicator which is the

theme of the institutional pillar of sustainability. This indicator can be measured by measuring the percentage of the population having paid bribes. The indicator also measures the level of corruption among government officials through crime surveys. Any decline in the indicator can be classified as a positive sign of tackling corruption among governments, as a good government is very important for sustainable development (The United Nations 2007).

According to Transparency international (2017) (global movement working against injustice and corruption) the goal 16 in the list of sustainable development goals (SDGs) which represents “peace, justice and strong institutions” illustrates commitments to fight corruptions, increase transparency, tackle illicit financial flows and improve access to information (Transparency international 2017). In terms of reaching all sustainability goals, corruption has to be considered as a major barrier. This is due to the fact that corruption hampers economic growth and increases poverty, denying the most marginalized groups of receiving an equitable access to the important services such as education, healthcare and water and sanitation. “With corruption, there's no sustainable development” (Transparency international 2017).

### **7.3.2 THE INDICATOR DEMOGRAPHIC:**

According to the results of sustainability indicators in the city of Benghazi in chapter 5, the demographic indicator was ranked 27<sup>th</sup> and categorized as an environmental indicator.

Benghazi municipality architecture consultant argues that, “social and demographic is a huge issue. Libya has always been a triple society and it’s always been built as a cluster and somehow, we don’t accept the outsider easily. But also, demographic distribution is affecting our environment too”.

“When people are all living in certain areas of the city based on the needs of services and economic reasons. This then would affect the environment in many ways such as, air pollution, green spaces and drinking water and sanitation”.

In addition to that, the Head of the Environmental Engineering Department at the University of Benghazi also argues that, the main environmental issues in the city of Benghazi are the issues for our coasts. It seems to be a disaster. The lack of green spaces is another major issue.

“The city of Benghazi has lakes and wet lands around these coasts and they are all facing many challenges. All of these challenges are also affected by the demographic distribution of the citizens across the city” (Head of Environmental Engineering Department at the University of Benghazi).

According to World Population Review (2020), Benghazi is the second most populated city in Libya (around 650,000 to 1,000,000). Libya in general has one of the world’s lowest population densities (World Population Review 2020). Statistics also shows that theoretically 3.6 people would live in every kilometer square of Libyan territory (World Population Review 2020).

On the other hand, population density in Libyan cities is concentrated in the Northern coastal strip (World Population Review 2020). In a city like Benghazi with an average area of a 314-kilometer square and a population of about 650,000 people, the estimation of the population distribution would be about 2070 people per kilometer square. However, this is a theoretical estimation of Benghazi's population density. On the other hand, the citizens of Benghazi are mostly located in areas where services such as sanitation and drinking water are available.

According to one of the urban planners in the city of Benghazi, slums are spreading due to the lack of services. Also, people are mostly located in the

areas of the city where drinking water, sanitation, roads, and electricity are available.

“The state must have control on spreading of slums in both physically and documental. About only 50% of Benghazi’s properties are legally authorized by the government. This is a serious problem, because citizens will not be able to apply for loans or any legal service or benefit” (Urban planners in the city of Benghazi).

In addition to that, one of the architecture consultants in the municipality of Benghazi argues that, “One of the major issues in Benghazi is waste management. This problem can be even due to poor planning. The way how our cities and our neighborhoods are being built shows that the last thing that they would think of is drinking water and sanitation. They would come and build 20,000 housing units in a block where there is no way it would be possible to have a sewage system. So, it is a bad construction and bad design management”.

According to Amati (2018), the ideal size of a city is based on the ability of citizens reaching the countryside. So, a resident who lives in the centre of a town can basically be expected to walk to the edge of the city for a distance of 3.2km (Amati 2018). Based on this concept, a city with a density of 50 people per hectare (0.01 Km<sup>2</sup>) would an ideal size of 160,000 people who can have access to public transport (Amati 2018). This then indicates that there can be up to 5000 people for every 1 Km<sup>2</sup>.

When considering this concept in the city of Benghazi which it has an average of 2070 people per Km<sup>2</sup>, an indication then is clear that Benghazi is at an acceptable level of people density. However, the arguments that were collected from several consultants said that Benghazi has a problem of demographic distribution. According to (C1) one of Benghazi municipality consultant,

“The core problem of demographic distribution is management”  
(Urban consultants at the Greater Amman municipality).

In addition to that, (A1) also argues that,

“Benghazi’s issues mainly are environmental issues, sewage system, garbage system, waste management in general. First of all, it needs a very well-organized studies, to know what is going on, and then the local authority should act and coordinate. Therefore, our core issue in the city is management” (Head of Biology Department at the University of Benghazi). This illustrates that the city of Benghazi is lacking urban planning and urban studies.

On the other hand, the results of sustainability indicators in the city of Amman in chapter 6 shows that, the demographic indicator was ranked 33<sup>rd</sup> and was categorized as a social indicator.

According to (A2), “the sudden increase in the population also does affect Amman, because Amman was not designed for that amount of people. the city was planned for 3 or 4 years to be expanded in a different way, and in the last few years actually because of the circumstance all over the Arab world now, so many people came to the city and they live in the city now so you can imagine the demographic change that will take place. Population in Amman used to be like a million and a half and now it is almost like 5 million or possibly more, and it all expanded in a few years so you can imagine the social impact on the city” (Applied science university lecturer).

In addition to that, (IO1) argues that the demographic change that took place in Jordan lately has resulted in a way of isolated communities.

IO1 also indicated that “In terms of the refugee’s problem, this issue has affected the services, the prices which had a negative impact on the whole community due to the high demand for houses. Also, this issue has affected the demographic distribution in the city. You will



be able to see different communities living in a locked loop” (The head of the country office of the international federation of the red cross organization).

According to Dalen and Pedersen (2007), the population of Iraqis living in Amman is distributed based on a number of factors including, ethnicity, religion and income (Dalen and Pedersen 2007). In addition to that, the lack of legal clarity concerning Iraqi’s status has always been an insecurity reason which lead to encouraging them to live in an “isolated” areas in Amman (Mansour 2019).

This situation is very similar to the situation of Iraqis who were living in Damascus before the war of 2011 in Syria. Mansour (2019) clarifies that as “neighborhoods that had become “little Baghdad's” or “little Fallujah. A mix of mostly middle-class urban Iraqis from all religions and backgrounds crowded the streets and their presence had given rise to small Iraqi cultural societies and mutual-aid organizations.

The wide diversity of Iraqi society used as an excuse for so much violence in Iraq was on a lively and harmonious display in Damascus” (Mansour 2019).

Furthermore, (A3) argues that the new migrants who are living in Amman at the moment have caused what he calls it “social conflicts”.

“Of course, there is a social conflict between people of Amman and the migrants who came to the city lately due to the differences in the culture (Applied science university lecturer).

In addition to that, one of the lecturers at the University of Jordan argues that new migrants in Amman have negatively affected the city in many aspects.

(A3) “The last time I read about the population ratio was 2 years ago. I think the number has decreased due to the opening of the borders

with Syria and the Syrian people started to leave back to Syria. So, the last time I read was that there are 2 million people extra to the actual number of citizens in Amman. By the way, most of these refugees were living in Amman rather than the refugee camps. These refugees negatively affected us in terms of employment rate. But I personally sympathize with them. Even though we are affected economically and in other social and non-social aspects such as water, electricity but I cannot say that I'm against these refugees. Because they are also in a very critical situation" (Lecturer of Social Science in University of Jordan).

Furthermore, after asking one of the urban consultants working with the Greater Amman municipality about the demographical impact of the sudden increase of population in Amman due to the large migrant wave that took place after 2011. (C1) argues that,

"We always hear about crimes and issues related to crimes in the media, but that is not only in Amman. Even driving became difficult because of the hard feelings between people towards refugees. Also, the sudden increase in the population has led to an increase in living expenses" (Urban consultants at the Greater Amman municipality).

On the other hand, (C2) argues that the impact of the demographical change in the city has affected the labor market. The impact then leads to reducing the quality of new buildings and infrastructure that are being built in the city.

"I think when we look at the competition between locals and refugees in terms of trade and businesses, we can see some kind of confusion in the market. This then affected many businessmen and businesswomen in the city and even some of them went bankrupt.

On the other side though, the new construction in Amman, are also not being built with sustainable construction materials due to the cheap labor. Therefore, the buildings are not designed well for hot summers and cold winters” (Architecture engineering consultant at the Greater Amman municipality).

On the other hand, one of the International Committee of the Red Cross (ICRC) delegations in Amman argues that the level of social conflict caused by demographic change is very limited. (IO2) argues that,

“In terms of crime rate and social conflict, I think the level still very minimum. There are social conflicts and social crimes but to be honest I would say Jordanians are very accommodative. I have been to the neighboring countries where there are Syrian refugees and I found a strong perception of refusing to those migrants but the situation in Jordan is different. The reason for that is that Jordanians are used to dealing with refugees starting from the Palestinians in the 1940s to the Iraqis in 2003 and now the Syrians.

Now, local government, local authorities and social leaders are trying also to reduce the conflicts. In terms of crimes, I think when you compare Jordan to the rest of the counties in the MENA region you can see that Jordan has a very low rate of crime. And when I say crimes, I mean things like pickpockets and these types of crimes” (International Committee of the Red Cross delegation in Amman).

According to Rockefeller Foundation (2020), the Greater municipality of Amman has established a full study and strategy to develop the city under the name of “Amman resilience”. City resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt and grow no matter what kinds of chronic stresses and acute shocks they experience (Rockefeller Foundation 2020).

In addition to that, the city of Amman has adopted the use of the City Resilience Framework to help assess the city's state of resilience. This framework was developed by Arup and The Rockefeller Foundation - called the City Resilience Framework (CRF) would assist cities to identify their resilience strengths, weaknesses and opportunities (Rockefeller Foundation 2020).

Furthermore, the the chief executive of the resilience project who was interviewed in December 2019, argues that within the resilience project, the Greater Amman municipality worked in many concepts that deal with sustainability and smart cities. The project is also supported by the United States Trade and Development Agency (USTDA) are supporting us on the road map project and the project is specifically focused on transportation. This is due to the fact that transportation is one of the major challenges that Amman is facing (Chief Executive of the Resilience Project Amman).

(C5) argues that “At the beginning, we analyzed the challenges that Amman is facing. And these challenges were divided into 2 sections. These are shocks and stresses.

Shocks are the sudden things that happens in the city and stress are long term things. For example, urgent infrastructure, congestion is part of the stress, and floods and earthquakes are shocks. We analyzed Amman based on that concept.

We found that migration was a stress. This is due to the fact that Amman has been hosting migrants for the last 100 years. However, this issue became a shock in the last 10 years.

Amman in 2008 had a population of 1.8 million, and now the number increased to be 4.2 million which it means that we more than doubled in 10 years.

After analyzing stresses and shocks, challenges in the city of Amman resulted and then we focused on specific areas. These areas are the main needs of Amman to become more resilience, smarter and more sustainable.

In addition to that, we concluded 5 areas, these are institutional financial planning, comprehensive urban development, effective legislation, environment and community. After that, we added a sixth area which is migration. This is due to the sudden increase of population which affected everything in the city specially demographically. After that, we did a diagnostic work, with an assistance from the stakeholders we started introducing solutions” (Chief Executive of the Resilience Project Amman).

In addition to that, the Chief Executive of the Resilience Project in Amman listed the shocks and stresses indicators as follows:

“The shocks list included economic crisis, terrorism, infrastructure failure, drought, heatwaves, and surface floods.

The stresses list included high energy cost, water shortage, lack of natural resources, limited access to financial assistance, effects of refuges, changing demographics, low-quality services especially in health and education, urbanization, unemployment, lack of affordable houses, lack of diverse livelihood opportunities and traffic and public transportation” (Chief executive of the resilience project Amman)

In agreement with that, Rockefeller Foundation (2020) classified the demographical changes in the city of Amman as a stress rather than a shock. This is due to the fact that the city that has grown rapidly and adapted to accommodate large migrant populations throughout its history, is already familiar with the concept of resilience (Rockefeller Foundation 2020).

#### **7.4 FINAL LIST OF THE LOCALLY RANKED SUSTAINABILITY INDICATORS FOR THE CITIES OF BENGHAZI AND AMMAN:**

Subsequently, the analysis of the challenges in the city of Benghazi which has led to the unified list of sustainability challenges illustrated in table 5.5, has then resulted in the potential list of sustainability indicators for the city of Benghazi as explained in chapter 5.

After that, a process of sustainability indicators ranking based on the concept of priority has taken place by the local citizens of the city. This then resulted in the final list of sustainability indicators for the city of Benghazi which are illustrated in chapter 5 table 5.9.

In addition to that, looking at the results of the final list of sustainability indicators for the city of Benghazi, it is clear to see that the results show that the 10 highest ranked indicators in the city of Benghazi was the unemployment rate with an average of 4.47 followed by health care, infrastructure, banking services, gender equity, corruption, city planning, education, waste management, and economic development.

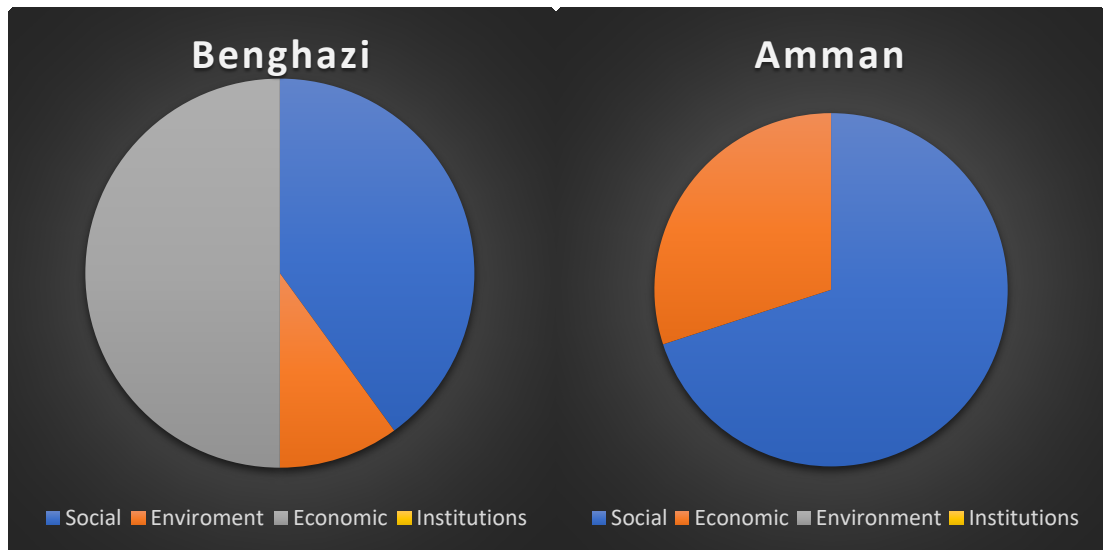
On the other hand, subsequently, the analysis of the challenges in the city of Amman has led to a different potential list of sustainability indicators as showing in chapter 6 table 6.8. After that, a process of sustainability indicators ranking based on the concept of priority has taken place by the local citizens of the city. This then resulted in the final list of sustainability indicators for the city of Amman.

Furthermore, looking at the results of the final list of sustainability indicators for the city of Amman, it is clear to see that the results are different from the results in the city of Benghazi. This is based on the fact that every city has its own priorities and essentials.

The 10 highest ranked indicators in the city of Amman were health care with an average of 4.34 followed by public services, standers of living, livelihood opportunities, infrastructure, education, wages rate, public awareness, security and poverty rate.

After observing the two cases, it is noticeable to see that 5 out of the 10-essential indicators at the city of Benghazi are economic indicators followed by 4 social indicators and 1 environmental indicator. On the other hand, in the case of Amman, 7 out of the 10 essential indicators are social indicators followed by 3 economic indicators. institutional indicators do not feature in the ‘top ten’ for both cases as shown in Figure 7.3.

**FIGURE 7.3 THE HIGHLY RANKED CATEGORY OF SUSTAINABILITY INDICATORS IN BENGHAZI AND AMMAN.**



**SOURCE: AUTHOR 2019**

#### **7.4.1 HIGHLY RANKED AND LOW RANKED SUSTAINABILITY INDICATORS IN BENGHAZI:**

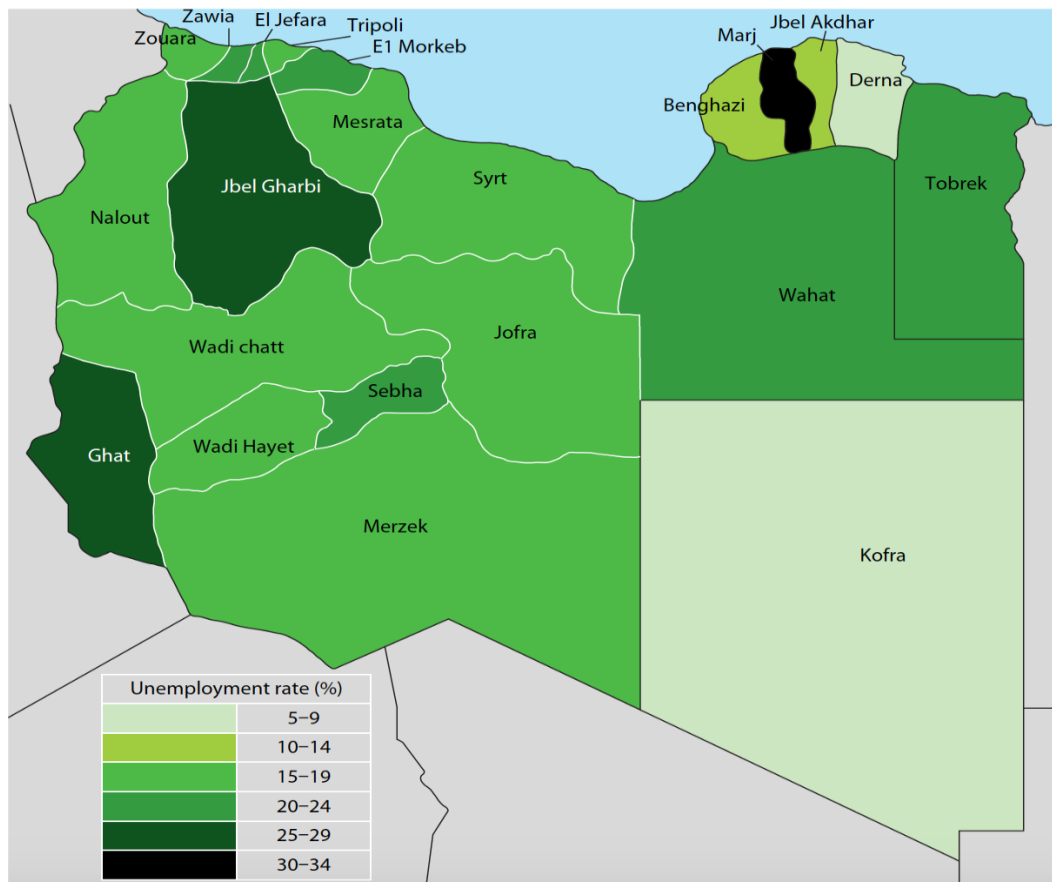
The consequences of Benghazi ranking were based on the effect of the uprising that took place in 2011. According to Diffidenti (2020), since the fall of Gaddafi's regime in 2011, Libya has been suffering from the ongoing instability and economic collapse, despite the country's large oil resources (Diffidenti 2020).

Although unemployment rate was ranked as the highest and most priority indicator for the local people in Benghazi, reports from international organizations such as the World Bank shows that Benghazi's unemployment rate is slightly lower than many cities in Libya including the capital.

According to the World Bank (2015), report on the Labour market dynamics in Libya, Libya's unemployment rate is widely based on the differences of region, particularly between the west and the east. Unemployment generally is higher in the western half of the country, including Tripoli (capital of Libya), compared to Benghazi. The following figure 7.4 illustrates the unemployment rate across Libya.



**FIGURE 7.4 UNEMPLOYMENT RATE ACROSS LIBYA**



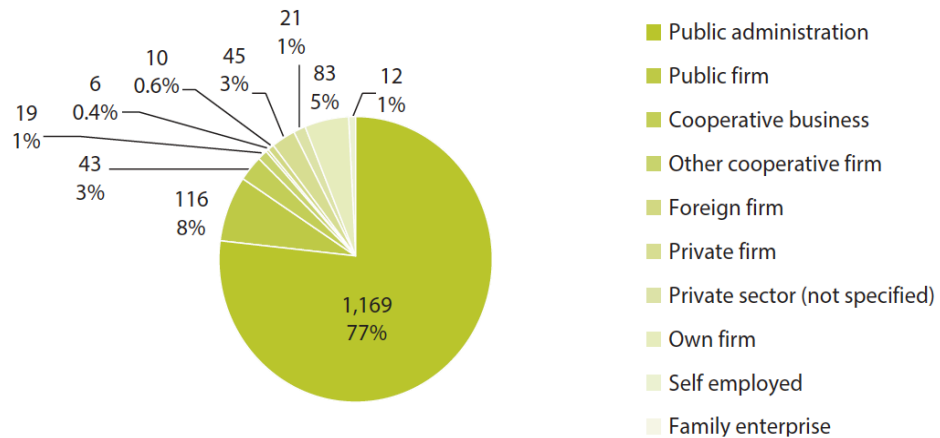
**SOURCE: (WORLD BANK 2015).**

According to (C1), the main reason for the unemployment rate in Libya in general and Benghazi in particular, is that people are depending on the public sector as the only way of getting an income (Urban consultants at the Greater Amman municipality).

“Unemployment rate in Benghazi is an issue. I don’t see why we have an unemployed people. I am in the field of construction and I can tell you that there so many jobs that local people can handle. Small businesses, small manufactures. We import 95% of our goods in construction. I don’t see why should we have an unemployed people” (Urban consultants at the municipality of Benghazi).

The following figure 7.5 shows the vast majority of the employed people in Libya working in the public sector.

**FIGURE 7.5 THE EMPLOYED PEOPLE BASED ON SECTOR IN LIBYA**



**SOURCE: (WORLD BANK 2015)**

In the same manner, (A3) also argues that, the solution to the issue of unemployment in Benghazi is by supporting the private sector in the city.

“Economically, I think the rate of unemployment is an issue that can be solved for example by creating new jobs in the private sector and not depending only on the public sector as an income” (Sustainability Lecturer at the University of Benghazi).

This illustrates that to enhance the issue of unemployment in the city of Benghazi, a number of policies should be taken including diversification of the economy resources for the citizens of the city.

On the other hand, the World Bank (2015) also argues that, following the uprising of 2011 a range of private-sector-promoting boards and agencies have arisen in

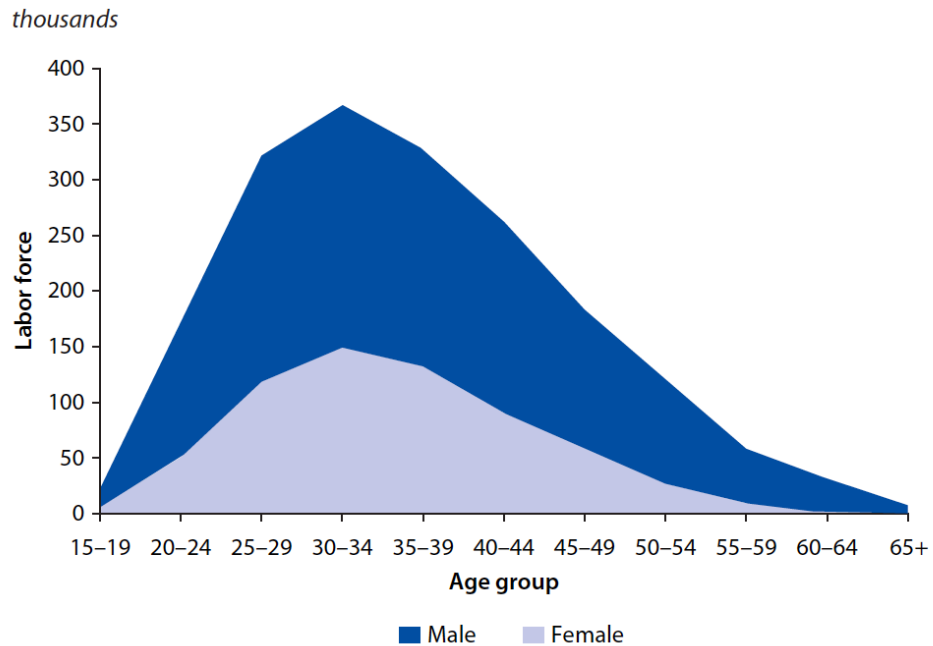
Tripoli, Misratah, and Benghazi. They operate nearly independently of one another. As the main economic actor in Libya is the Ministry of Economy, which is mainly involved in supporting national programs for Small and Medium Enterprise (SME) development, it is essential that Ministry of Economy facilitate SMEs' by allowing access to loans through simplifying the guarantee requirements and interest rates (World Bank 2015).

In addition to that, after asking the telecommunication minister in the Libyan government (C4) about the main stakeholders regarding urbanization and city planning of Benghazi, the answer was:

“Government and private sector. I mean, I think it is also, if we talk about individually even the small SMEs (small and medium-sized enterprises) should be involved. Because this will give them a chance to grow up also and find a better environment to grow up and find them self in the industry. So, small and medium business should be also included here” (Libyan Minister of Telecommunication).

Additionally, by looking at the distribution between females and males in terms of employment rate in Libya, the following figure 7.6 shows that the rate of employment among females is higher than males.

**FIGURE 7.6 THE RATE OF UEMPLOYMENT AMONG MALES AND FEMALES IN LIBYA**



**SOURCE: (WORLD BANK 2015).**

According to the above figure, the rate of employed males at the age between 30-34 is almost 3 times the rate of employed females. This indicates that there is an issue of gender equality in Libya. Looking back at table 5.8 in chapter 5, it is clear that gender equality was ranked as 5th on the Benghazi sustainability indicators ranking.

(A2) argues that “Gender equality issue is a major challenge in Benghazi. I guarantee you that when you interview other male participants, they would say that we don’t have an issue regarding gender equality. However, I think one of the main aspects of sustainability is making sure that we have gender equality. We all need the right to public places and we need it to be safe for all and all are included.

I should also mention that inclusion should include gender differences and people with special needs too. We should always think about the city as a city designed for all, men, women, elderly

people, disabled people and children” (Urban planner at the University of Benghazi).

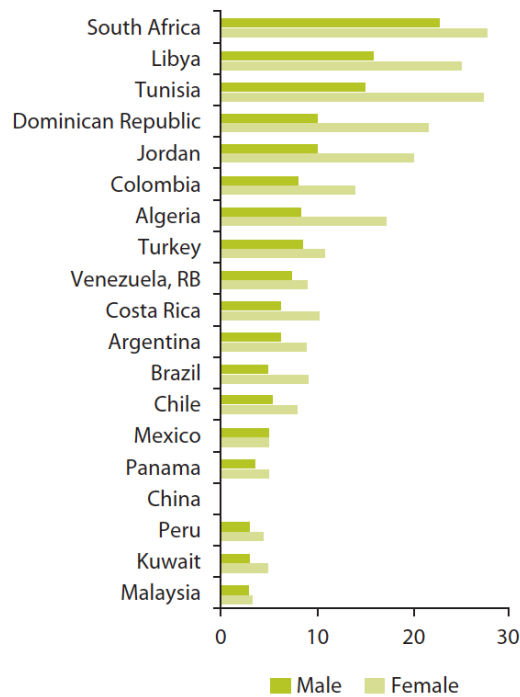
On the other hand, (C3) argues that there are no issues with gender equality in Libya. Both males and females are able to work and be employed (Economic consultant at the Libyan government).

This indicates that the law allows both genders to work and be employed, but the question here is.; Are females given the same opportunity as a male in terms of being employed? According to the figures above, the gap is quite large.

Furthermore, (C1) strongly disagree with the issue of gender equality in Benghazi. “Gender equity. Yes, you know I been teaching in the university for over 17 years, I have never seen any problems with male and female. They have every right to everything. So, equity I think we do have it up to a point, and in our law, there is nothing that define male or female. They both have the same rights. But again, that goes back to the religious thinking and culture thinking which is the main thing” (Urban consultants at the municipality of Benghazi).

This indicates that the law allows females to work as males, however there is gender discrimination when it comes to the process of selection of employees in the city of Benghazi. this issue doesn't only appear in Benghazi, but it is across the world. the following figure 7.7 illustrates the ratio of unemployment females and males in different countries including Libya and Jordan.

**FIGURE 7.7 THE RATIO OF UNEMPLOYMENT AMONG FEMALES AND MALES IN VARIOUS COUNTRIES INCLUDING LIBYA AND JORDAN**



**SOURCE: (WORLD BANK 2015)**

In addition to that, the banking sector in Libya also has been affected by the ongoing instability situation in the country. Therefore, banking services was ranked 4<sup>th</sup> by the public in the city of Benghazi.

One of the consequences of the Libyan crisis, is the monetary crisis. Since the “civil war” which started in 2014, many Libyans have been suffering from the availability of cash. According to Harchaoui (2018), the financial crisis in Libya, included a chronic shortage of dinar banknotes, along with a weak valuation of the Libyan currency in the black market first emerged in 2014. This monetary crisis has consistently intensified through the months (Harchaoui 2018).

Another reason for the monetary crisis was the lack of trust between the banking sector and citizens in Benghazi. People in Libya prefer to keep money in their houses rather than banks.

(C4) argues that, “people in Libya always preferred to save their money at home rather than banks. I think this is due to trust issues between citizens and institutions as well as banking and financial services in the country. Also, the lack of professional financial services in the country led to the creation of a cash-based economy” (Libyan Minister of Telecommunication).

On the other hand, (C3) argues that, “the financial issue in Libya is something else, to be honest with you. This is related to the political issue in the country which resulted in almost two governments running the country. This maybe creates some kind of harm to the Libyan society and the economy also could be harm regarded to the central bank. We have two central banks and every central bank issue his own currency you know. Besides the increase in the rate of foreign currencies to the local currency. Also, there are a lot of issues regarded by the United Nations policies which have led to the issue of Libya's money being frozen overseas. This is also one of the important issues that could make a problem for Libyan society” (Economic consultant at the Libyan government).

(C4) also argues that there have been some improvements in the banking sector in Benghazi and new electronic financial services have been established in the city such as, electronic checks, mobile payments and ATM cards.

According to Zaptia (2019), Assaraya Trading and Investment Bank (ATIB), which is a leading private sector Libyan bank, opened its administrative headquarters for Libya’s eastern region and its Benghazi branch in 2019. the bank provides online banking services as well as collaborating with expertise from France and the UK government to establish a microfinance institution in Benghazi and Tripoli. Also, the bank announcing a banking academy which cooperates with Libyan universities, led by Benghazi University, to train the new graduates of banking and financial backgrounds and prepare them to support the Libyan banking sector (Zaptia 2019).

Even though a number of financial and banking services improvements have taken place in the city, a large number of the population still considers that the banking sector in Libya is fairly poor and the monetary crisis is not improving. In addition to that, 100 citizens who are living in the city of Benghazi were asked to name the current main three issues of the city. 87 out of 100 mentioned that the monetary crisis is one of the main three issues in the city.

Furthermore, the fighting that started in 2014 and finished in 2017 which was between the National Army and the armed militias in the city, has resulted to destruction of nearly 30 health facilities and many other infrastructure in certain areas of the city (Diffidenti 2020).

Figures 7.8 and 7.9 shows destruction in the city of Benghazi due to the armed conflict that took place from 2014 to 2017.

**FIGURE 7.8 DESTRUCTION IN THE CITY OF BENGHAZI**



**SOURCE: AUTHOR 2019**



## FIGURE 7.9 DESTRUCTION IN THE CITY OF BENGHAZI



**SOURCE: AUTHOR 2019**

This then explains the fact that health care and infrastructure were ranked 2<sup>nd</sup> and 3<sup>rd</sup> with an average of 4.43 and 4.42 respectively. On the other hand, (C1) argues that the issue with health care is management rather than infrastructure.

“Health care and infrastructure. Yes, again all Libya have the right to access for free health and it is not the best. Though, if we look at Benghazi itself, and this is one of the things or it is very important issue that I always talk about. We have over 5000 beds for a population of a 900,000 and we the worst or one of the worst health systems. Though, when it comes to building infrastructure, it is over there. So, the situation that we are having here is medical management problem. And that is a big issue” (Urban consultants at the municipality of Benghazi).

Furthermore, (C1) classifies that the issue of infrastructure in the city of Benghazi is mainly the transportation infrastructure.

“We do have a problem in transport and infrastructure. Major one. And it is due to the political situation of the country. But also, due to

the lack of infrastructure in the country which has always been a concern” (Urban consultants at the municipality of Benghazi).

Also, (A1) refers to the infrastructure as a major problem in the city of Benghazi based on the lack of communication systems.

“When we try to measure the performance of the city of Benghazi, we can say that it depends on the quality of services. I mean, especially the infrastructure of networks such as internet and communications etc. So, mainly the infrastructure of the city is below the average and communications is considered to be very slow” (Head of Biology Department at the University of Benghazi).

(IO1) also argues that the lack of infrastructure in Benghazi is a major concern and a barrier against any development in the city.

“As I think the biggest challenge that we have is the lack of infrastructure. We don’t have an infrastructure; technology is very basic and of course this is what we have to do. We need to have the people that understand technology and they know the importance of using it and to make it applying for a greater number of people that they will try and push and try to use these things. So, I think the biggest challenges are infrastructure and the knowledge of technology” (UNDP representative in Benghazi).

According to the public’s opinions in the city of Benghazi, corruption which is ranked as 6<sup>th</sup> in the sustainable indicators ranking table, is a major challenge in the country in general and the city in particular. After asking 100 citizens in Benghazi, 78 people out of 100 put the word corruption as one of the major three current challenges in Benghazi.

In addition, (GD1) and (GD2) both agreed that corruption is a major challenge in Libya and always have been.

“When we say corruption in Benghazi, we talk about almost everything in our lives. As a matter of fact, it has become part of our society” (Group discussion 1&2).

Furthermore, (C1) argues that corruption affecting the whole process of economic development.

“Unfortunately, in Benghazi economic development has always been a government-driven, and this doesn’t work with the global world anymore. It never worked anyway. This then emphasizes that corruption is a big problem of ease of doing business in Libya generally and Benghazi particularly. In fact, corruption is the main thing” (Urban consultants at the municipality of Benghazi).

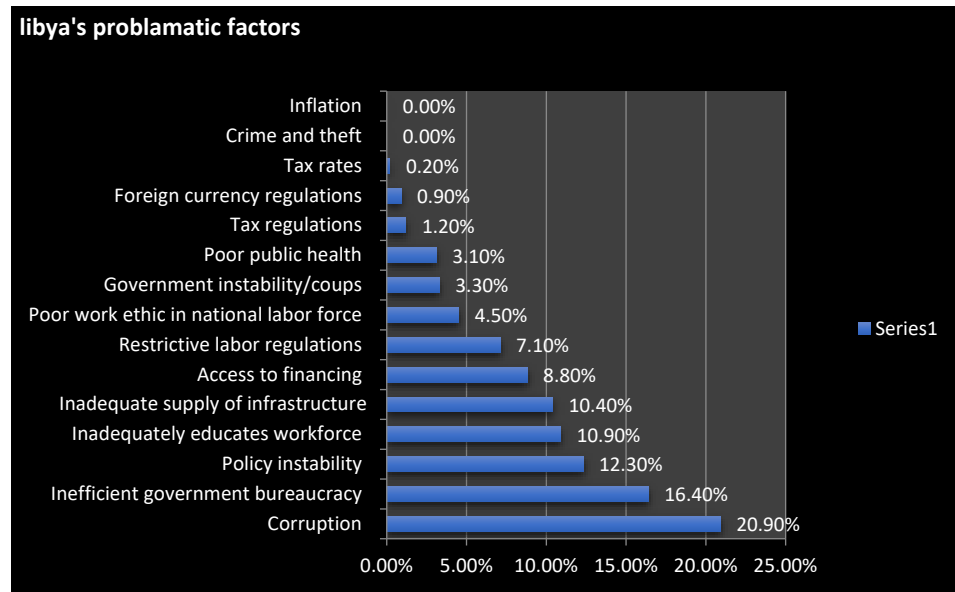
After that, (C1) was asked why did he classified institutional capacity and institutional framework in Benghazi as “Nil”?

“Institutional framework in Benghazi is another issue that has to do with the political situation of the country. Institutional capacity in Benghazi also, I would say “nil” “zero”. This is due to corruption; you know the country never had a step one start building these institutions. It never had a continuously settled era. That is why Libya has always been suffering from this issue and I think it will continue so” (Urban consultants at the municipality of Benghazi).

Nevertheless, corruption is a social phenomenon that, naturally, cannot be defeated by one law. But, according to the fact that Libya is a tribal society, the social relationships between people had a negative impact against fighting corruption (Wimmer 2009).

In addition, corruption is the first problematic factor for doing any business or providing any service to the public in Libya. Figure 7.10 illustrates the problematic factors for doing any business in Libya in 2011 (Schwab 2011: 216).

**FIGURE 7.10 THE PROBLEMATIC FACTORS FOR DOING ANY BUSINESS IN LIBYA**



**SOURCE: SCHWAB 2011**

The case of Benghazi shows that public institutions management plays a large role in spreading corruption in the public sector. This is due to the fact that public sector workers manipulate law enforcement to heighten private gain rather than supporting public interests. Moreover, as the Libyan politicians have no intention of fighting against corruption physically, it is then affecting the role of law, regulation implementation, attention for foreign investments, and developing public administrations. Also, due to the fact that corruption is a deep issue in the Libyan community that existed for a very long period of time, it has become what is called “systematic corruption”, which it means that corruption in the institutions in Benghazi became part of the system that operates in delivering services to the public.

On the other hand, if corruption is affecting public institutions and it is one of the top five indicators in Benghazi, then why did the citizens of the city rank the

institutional indicators at a low level? According to the public's opinions in Benghazi, the indicator institutional capacity and institutional efficiency were ranked as 24<sup>th</sup> out of 37 indicators.

After asking (A3) who are the key stakeholders involved in making Benghazi a sustainable city? The answer was as "The situation still not clear, even the government in Benghazi is just a local government and don't have full authority. But there are some institutions such as the authority of rebuilding Benghazi who are planning to reconstruct Benghazi. However, their main goals are economical and infrastructure. This is due to the fact that people are not interested in other indicators in the meantime. But we need to remember that as long as people do not have basic needs, the no one will be thinking about sustainability as a priority" (Sustainability Lecturer at the University of Benghazi).

In addition, (A2) argues that people's priority in Benghazi now is their day-to-day needs. I believe most people in Benghazi would agree that the main priorities are access to good health care and hospitals, availability of cash and the reconstruction of the destroyed parts of the city which occurred during the civil war (Urban planner at the University of Benghazi).

In conclusion, the points mentioned previously indicate that the residents of Benghazi regard institutional sustainability indicators as reasonably low. This is due to the fact that institutional capacity and efficiency do not directly affect the day to day needs of residents in the city. The same concept is applied in the last 5 substantiality indicators (Spinster rate, national reconciliation, freedom of media, communication with the outside world and work-life balance).

In addition, a survey collating the views of one hundred citizens of Benghazi illustrated that eighty-three percent of participants agreed that healthcare, a good standard of education, reliable banking services, and sufficient availability of cash

were vital in securing a sustainable city. This again signifies that residents are interested in factors that are closely related to their own livelihoods. In addition, the indicator Spinster rate was ranked 33rd shows that such a problem is not as important as other issues such as gender equity or the level of education. This illustrates that the rate of a spinster is not as high as it was illustrated in the literature in chapter 4.

#### **7.4.2 HIGHLY RANKED AND LOW RANKED SUSTAINABILITY INDICATORS IN AMMAN:**

The consequences of Amman's local ranking were different from Benghazi's results. As Amman's priorities were social indicators, it is arguably clear that there are a number of social challenges in the city. According to Awadallah (2015) Jordan's five biggest challenges are terrorism, the number of refugees, the effects of the Palestinian crisis, unemployment rate, and economic reform (Awadallah 2015). This also indicates that most issues in the country are social issues. At the level of the city of Amman, the situation was not much different.

Although Jordan is considered to be one of the region's medical hub, the citizens of Amman have ranked the indicator of health care as their most concerned indicator. According to Alsarayreh et al. (2017), Jordan ranks first in medical tourism in the Middle East and North Africa region, and it is one of the top five in the world. Amman was also chosen in 2012 by the Council of Arab Ministers of Health as the capital of Arab medical tourism destination (Alsarayreh et al. 2017).

On the other hand, Nawas (2020) illustrates that in 2019 a drop from 250,000 to 220,000 in the average number of medical tourists in Amman was reported. The president of Private Hospitals Association (PHA) Fawzi Hammouri said that medical tourism numbers "are still less than the desired target". This is due to the unresolved issue of restricted nationalities and the regional competition from countries like Turkey, Tunisia, and India and overall instability in neighboring Arab countries (Nawas 2020).

After interviewing a number of decision-makers in Amman, the problem with health care in the city appeared to be a management problem. The health care system in the country is divided into 2 sectors, public, and private. The issues with the health public sector are the lack of appropriate management, lack of fair distribution of services between the areas in the city, and the fees of insurance. On the other hand, the private sector would provide better quality services but with much higher expenses.

According to (GD2) “we have so many problems with the education system and the health system. For example, you have to be a Jordanian citizen to go to public hospitals, so if you want to go to a public hospital, you will be able to get free treatment but of course, the quality of the treatment is very poor. I personally would rather pay a lot of extra money to go to a private hospital than go to the public one. The public hospitals are not clean, not organized, with poor services. Therefore, we don’t have a good system for health care” (Group discussion 2).

In addition, (A4) argues that some people are incapable of paying the insurance fees for medical care in the city of Amman.

“What about health care and education? If there a challenge in Amman?

Of course, there is. For example, when you say health insurance, not everybody has health insurance. Lack of services in public schools and public hospitals. This would then lead people to use the private schools and hospitals which are very costly” (The head of the Department for Civil Engineering at the Applied Science University).

Referring to the problem of management in the health public sector in Amman, (A5) argues that there is an issue of “favoritism” in health care in public hospitals. “Basically, if you know someone who works in the health public sector like a relative or a friend, then you are most

likely to get a better service. It is, unfortunately, true” (Urban planning and design lecturer at the applied science university).

According to (C5), health care was one of the stress factors in Amman’s resilience project. This then indicates that the issues within the public health care system in Amman are not temporary issues however they are long-term problems.

According to the latest news regarding the Covid-19 virus, Jordan like many other countries struggled with the crisis has been facing many challenges including the challenge of the refugees. Brookings (2018) report shows that Jordan is struggling with tough political and economic conditions. Due to the increase in healthcare demands in refugee camps, the Jordanian government allowed registered refugees to have free access to public primary health care centres and to hospitals. This decision led to an increase in the prices of operations and all other health care facilities (Brookings 2018).

Based on such a decision, more pressure was put on the health care public sector in Jordan which resulted in more challenges, especially with the current Covid-19 virus crisis. According to the Amman news (2020) Private Hospitals Association (PHA) put the capabilities of the sector at the disposal of the Minister of Health. This gave the ability to the Minister of Health to have full access to the use of private hospitals to cope with the crisis of the Covid-19 virus. The main issue being the lack of full capability of the public sector to cope with the crisis (Amman news 2020).

Consequently, these issues justify the reasons why the citizens of Amman ranked health care as their number one priority. The public health care sector in Amman is struggling with a number of challenges including lack of quality of services and management. According to the ranking of sustainability indicators in Amman, public services and standards of living were ranked as 2nd indicator.

Based on the field work that took place in Amman in November 2019, it was clear to see that there was a gap between the east and west side of Amman. The



distribution of public services which includes sewage systems, roads, hospitals, schools and transportations is disproportionate.

According to (GD2) there is a gap between the east and the west of Amman in terms of services distribution.

“Now, even the schools, and I'm talking about public schools here, it all depends on the area you are living in. the areas on the west side of Amman have good public schools compared with the east side of Amman. Therefore, there are no standards for public schools in Amman. In public hospitals, if you don't know someone who works there you won't be able to get any services and that is based on the lack of system and organizing the public institution.” (Group discussion 2).

“The issue is that these people who are living in poor areas in Amman are paying the same amount of taxes as people living in good areas. However, the services received are different. Even public hospitals are better in west of Amman than the public hospitals in the East of Amman. The issue here is, visiting the hospital depends on where you live. For example, if you are living in the east of Amman, you are not allowed to get medical care in a hospital based in the west of Amman. So, it depends on the location of the accommodation.” (Group discussion 1).

The following two figures 7.11 and 7.12 illustrate an entrance of a hospital in the east side of Amman and a sewage water flowing in one of the streets in the east side of Amman.

**FIGURE 7.11 THE ENTRANCE OF A HOSPITAL IN THE EAST SIDE OF AMMAN**



**SOURCE: AUTHOR 2019**

**FIGURE 7.12 SEWAGE WATER FLOWING IN ONE OF THE STREETS IN THE EAST SIDE OF AMMAN**



**SOURCE: AUTHOR 2019**

On the other hand, the following two figures 7.13 and 7.14 shows Al Abdali area in the west of Amman. The figures show facilities including roads, street lights, buildings and medical centres in the west of Amman.

**FIGURE 7.13 AL ABDALI AREA IN THE WEST OF AMMAN**



**SOURCE: AUTHOR 2019**

**FIGURE 7.14 AL ABDALI AREA IN THE WEST OF AMMAN**



**SOURCE: AUTHOR 2019**

The figures above illustrate the differences between the east and the west sides of Amman, in terms of street designs, infrastructure, hospitals, and other public spaces and services. Also, the differences in services between east and west of Amman are affecting the citizen's standards of living and their livelihood opportunities which they were ranked as 2nd and 3rd in the local sustainability indicators ranking.

According to (C2) “the sudden increase in the population has led to an increase in living expenses. In addition, there are differences in terms of public services between the east and west areas of Amman. But in general, it is difficult to balance the level between all the people living in the same city” (Urban design consultant).

On the other hand, (C1) justifies the differences in public services between the east and the west of Amman as a “Historical matter”.

“Historically, people were living on the east side of Amman. Therefore, you would find that the eastern areas of Amman are much more crowded than the west of Amman. Also, you can see that buildings are older on the east side of Amman, which makes it difficult to develop or renew” (Urban design consultant).

In addition to that, the indicators of standard of living, livelihood opportunities, and infrastructure were ranked 3rd, 4th, and 5th respectively. Most citizens who were interviewed have mentioned the gap in the standard of living between the east and the west of Amman.

People from the group discussion that was conducted (GD2) quotes the following “For example, when you go to the east side of Amman, you would find areas that don’t even have a sewage system and on the other hand, you can drive only 20 minutes away from that area and find yourself on a whole different level and a different standard of living”.

“Now, even the schools, and I'm talking about public schools here, it all depends on the area you are living in. the areas on the west side of Amman have good public schools compared with the east side of Amman. Therefore, there are no standards for public schools in Amman” (Group discussion 2).

As mentioned earlier, historically the eastern areas of Amman have always been cheaper and built to a lesser quality than the western areas. The eastern areas of Amman have always been occupied by refugees, starting from Palestinians to Iraqis and now most commonly, Syrians. The reason behind being that is these areas are cheaper in terms of rent and services due to the fact that most of the buildings in the east of Amman were originally refugee camps. Also, due to the increase in the number of the population, a number of issues arise too, including

a higher demand in health services, educations, job opportunities, water, and sanitation systems.

In addition, another challenge in the city of Amman is infrastructure. According to (GD1), infrastructure including streets, main roads, and sewage systems are one of the main challenges in Amman.

(GD1), "In Amman, the only public transportation in the city are buses or taxis and the people of Amman find it hard to accept change, If they get used to a certain type of life or a certain type of transport, then they find it hard to accept the change of it" (Group discussion 1).

(A2) also argues "I believe Amman wasn't designed for this number of people, the infrastructure that now we have is actually overloaded now, the expanding plans for the new zones of the city are actually affected because they are spending so much money now on the first phases. We have to establish now a new bus system and a new transportation system and this because of the expansion among the population in the city itself" (Applied Science University lecturer).

After asking the Head of the Country Office of the International Federation of the Red Cross organization in Amman about the definition of sustainable city. The answer was "In a very simple language. Easy going city, access, services, and infrastructure. In accessing all these services, we need the use of technology, and up to an extent you don't need the physical appearance".

In the same manner, (A4) defined the sustainable challenges in Amman as "in Amman, we can say it is a well-established city so when you try to convert it to a sustainable smart city, we have to have a new infrastructure built. So, renewing the infrastructure would be

a big challenge as you see the bus lane” (The head of the department for civil engineering at the applied science university).

Based on the citizens of Amman's responses, the infrastructure challenge in the city is mainly focused on the issues of transportation. According to the 100 citizens in Amman who were asked to mention the main three challenges in Amman, 79 people mentioned transportation and the consequences of a poor transportation system such as air pollution and congestion are the main challenges in Amman.

The issue of transportation in Amman is divided into 2 phases. The ability of the government institutions that should be able to manage and build an effective transportation system, and the citizen's behavior. According to (GD1), people who are working in private companies find it difficult to compete with the new buses that are provided by the government. Therefore, they would create some actions such as breaking bus windows and bus stops signs to make people come back to their private companies (Group discussion one).

“The issue of such actions is not based on a lack of security; however, it is about manners and culture and the acceptance of competition. The citizens of Amman would like to have a proper public transportation facility. At the moment there is no system for transportation, and that can only be done by the government” (Group discussion two).

In the meantime, there is this new project which is called the “fast bus”. This project has been going on for more than 6 years now and still not finished yet. After asking a number of people working in the public sector in Amman about the reason that this project is taking so long, it appears that the answer is corruption, and the design of the project does not match the reality of the shapes and structure of the streets. Therefore, they had to change the design of the project and start all over again after a few years of implementation. The following figure 7.15 shows the Fast bus” project lanes in Amman.

**FIGURE 7.15 THE “FAST BUS” PROJECT LANES IN AMMAN.**



**SOURCE: AUTHOR 2019**

In accordance with the institutional capacity and efficiency which were ranked 21th out of 36 sustainability indicators in Amman, it is clear to see that a similar ranking between Benghazi and Amman was given to the institutional indicators. However, the people of Amman ranked the institutional indicators at a low level due to the fact that most citizens think that public institutions in Amman are functioning the best they can based on what is available.

For example, (C4) argues that the public institutions in Jordan are not as weak as many people may think. Even though there is some kind of corruption in the country but it is very limited. “As I mentioned earlier mainly Amman have the barrier of economy, and also the problem of transportation which needs an urgent and economical solution. Therefore, the main issue of the transportation system in Amman is the availability of funds which should support such major projects” (Dean of the Engineering Department at Zaytoona university and a city planning consultant at the Greater Amman Municipality).



In addition to that, the citizens of Amman also ranked the indicators of refugees, demographics, and the number of populations at a very low ranking. This is due to the fact that the majority of the people who were asked about the issue of refugees would argue that the city of Amman has always been familiar with refugees. Starting from the Palestinians in the 1940s to Iraqis and now most commonly, Syrians.

The citizens of Amman argue that people are integrating together smoothly in the city of Amman, however, all issues in the city including transportation systems are due to the lack of appropriate government budget that should allow the institutions to establish major projects and solve the issues within the city.

(C4) quote "I think there is familiarity between people here, you wouldn't feel like a stranger when you are in Amman you would hear about migrants in the USA and other countries, but you will always find the problem of the lack of integration between people. But in Amman the case is different, you would find yourself quickly integrating with people whether at working scale or at the neighborhood level. As I said, the city became crowded and affected transportation and other things. But on the other hand, the problem of crowds opens doors to other things too such as job opportunities. For example, in Amman, you would find restaurants from different nationalities across the world. Even the names of the shops, for example, I'm Iraqi and I would notice the Iraqi names of the shops. Also, you would find Yemeni and many other names. And that is a good thing that Amman is hosting all of these different backgrounds." (Dean of the Engineering Department at Zaytoonah University and a city planning consultant at the Greater Amman Municipality).

Furthermore, the indicator of the communication network was ranked as 32nd due to the fact that the internet and telecommunications services in the city of Amman are at a decent level. Therefore, telecommunications issues are not a priority for the citizens of Amman. Also, the indicator of data sources was ranked

at a low level because such an indicator does not directly affect the day to day needs of residents in the city.

Moreover, the indicator of centralized government was ranked as 36th which is the least important, is due to the fact that is the city of Amman is also the capital of Jordan. Therefore, if the government of Jordan was centralized in the capital, the citizens of Amman would not be directly affected.

## **7.5 COMPARING THE ALISA RESULTS WITH PREVIOUS STUDIES:**

It is useful to compare the results of the conceptual framework ALISA in both cities, with the available literature that shows similar examples of developing sustainability indicators.

An analysis of 17 studies of the use of urban sustainable development indicators (SDI) in different western nations shows a lack of consensus on the conceptual framework and the approach forward. Also, the studies show a lack of consensus on the selection and optimal number of indicators (Tanguay et al. 2010).

With regard to the comparison between the 17 studies and the results of ALISA, the number of indicators that resulted in the 17 studies was between 10 to 86 (SDIs), while the number of sustainability indicators developed by ALISA in both cities was 37 sustainability indicators in Benghazi and 36 sustainability indicators in Amman. Also, the number of the total sustainability indicators illustrated by the (UNCSD 2001) is 58 indicators (Wu and Wu 2012). This shows that the number of sustainability indicators developed by ALISA in both cities falls within the range of the 17 studies.

In addition to that, developing sustainability indicators in the 17 studies was by performing different classifications and categorization of (SDI) through identifying problems inherent in different territorial practices (Tanguay et al. 2010). A similar approach was applied in Benghazi and Amman by using ALISA which

categorized different challenges in the cities and reforming them into sustainability indicators.

It can be argued that the lack of consensus in several steps of the developing of sustainability indicators in the 17 studies is based on the ambiguity in the definitions of sustainable development, objectives for the use of such indicators, the method of selection and ability to access of qualitative and quantitative data (Tanguay et al. 2010). Furthermore, the 17 studies lack providing the ability to the local people to priorities the indicators unlike the case of the ALISA framework.

Prioritizing the indicators in the conceptual framework ALISA, gave the ability to the local citizens of the two cities to understand and have a clearer image of the meaning of sustainability. Also, it gave the institutions in the cities an idea of what are the key indicators to the local people, which can be useful for any future development planning in both cities. Also, the research attempted to test the effectiveness of the ALISA framework by applying it in two difficult situations including the post-conflict city of Benghazi and the refugee crowded city of Amman.

Although a number of sustainability indicators that are developed in the 17 studies are the same as the results of ALISA's results in Benghazi and Amman, few indicators were only developed in certain cities. For example, the sustainability indicators of energy, transport, waste, education, and health are all available in both cities (Benghazi and Amman) as well as the other cities in the 17 studies. This is due to the fact that such indicators are essential to every city as the day-to-day life of people is directly affected by them.

On the other hand, some indicators are privatized for certain cities. For instance, the indicators of reconstruction, political situation, lack of solving the problem of displaced citizens, and spinster rate are all part of the sustainability indicators for the city of Benghazi. In the other case, Amman also has some indicators that they can only be essential in the city of Amman such as the indicators of refugees and institutional publications.

This illustrates that using the conceptual framework of ALISA gives the ability to categorize each city's indicators independently. Furthermore, the (SDI) found in the 17 studies are based on the three pillars of sustainability (social, economic, and environmental). On the other hand, the results found in the current study are based on the (UNCSD, 2001) which identifies indicators in four sectors (environmental, social, economic, and institutional). This gave the ability to clarify the issues of the institutional sector in the two cities which gave the ability to understand and analyze the issues of the cities in a deeper way. In addition, the results of the current research are likely to reflect the situation found in Benghazi and Amman based on two levels (institutional and local) levels.

When observing the effectiveness of the framework of ALISA, it is important to check whether the framework has really developed key sustainability indicators that match goals at local and institutional levels. Therefore, a number of sustainability indicators were developed through the literature such as (Potter, 2017), (Jaber and Probert, 2001), (Thompson, 2018), (Al-Fares 2011), (Alhodairi, 2012), (Abdudayem and Scott, 2014) and (Salam et al, 2011) to introduce the concept of indicators to people who are working in the institutions in both cities.

This introduction method has given the ability to the researcher and the people who are working in the institutions to start the process of developing indicators. In addition, in steps 3 and 4 of the ALISA methodology, sustainability indicators were reflected by reforming objectives into indicators by consultation from university experts in both cities.

Based on the concept that the indicators must be credible, simple, and easy to understand by the public as shown in steps 5.4, the final lists of indicators shown in tables 5.9 and 6.8 are the list of sustainability indicators developed using ALISA conceptual framework in the cities of Benghazi and Amman. These indicators met most of the desired development goals for both cities. Therefore, the methodological framework ALISA can be considered as applicable, sensible, and appropriate to develop sustainability indicators at the local and institutional levels. Also, the implementation of the ALISA framework in two difficult contexts in the

Middle East, gives an original contribution of the ALISA to the knowledge of sustainability.

On the other hand, there are some areas in the methodology of ALISA that can be improved. These will be discussed in the following chapter (8), as well as testing the methodological framework ALISA in terms of strength, weaknesses, opportunities, and threats in the following section 7.7.

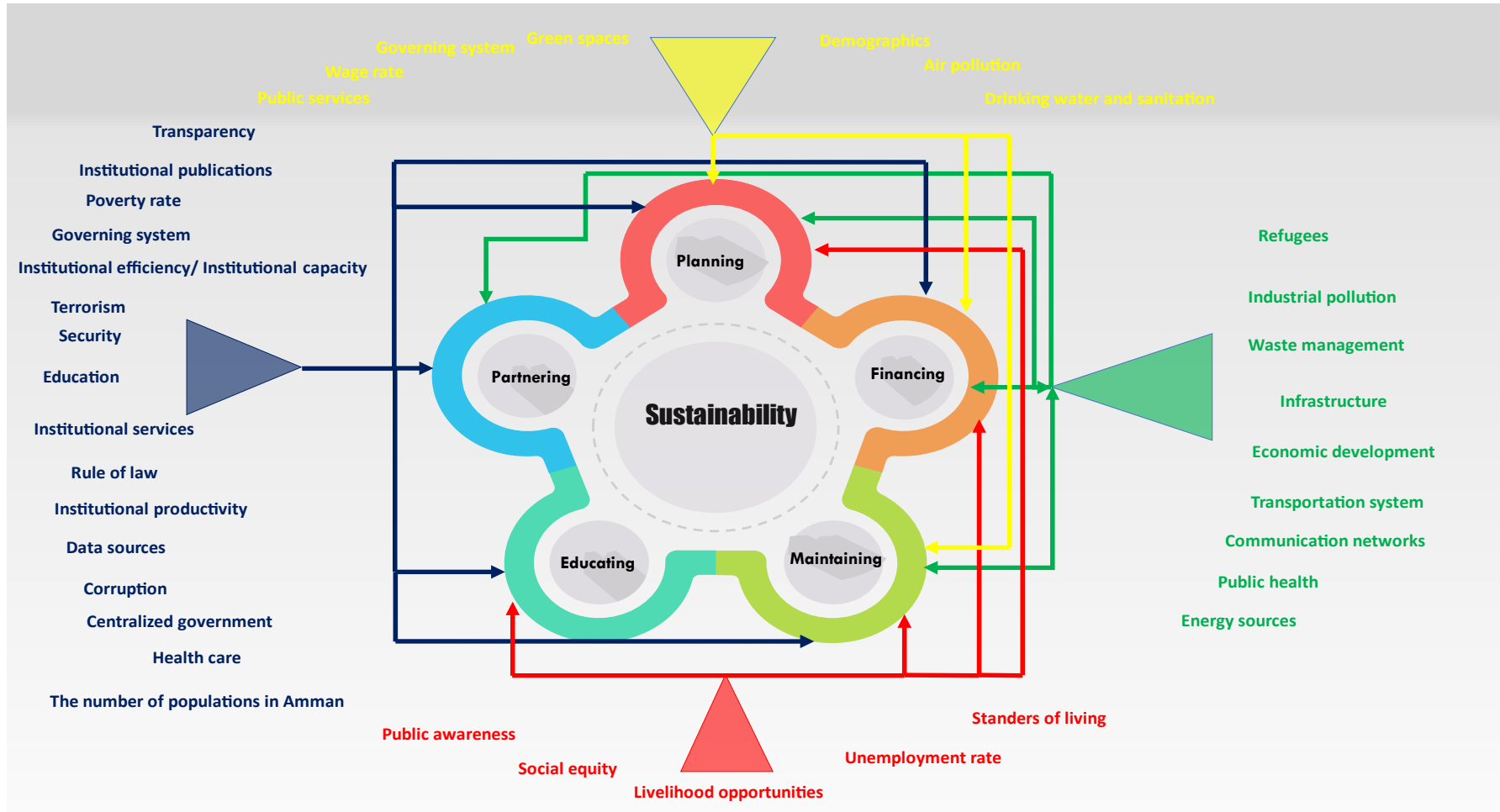
## **7.6 SUSTAINABILITY INDICATORS AND POLICY TOOLS:**

Moran et al (2006) argue that over the past 20 years, the tools of government have been analyzed in at least three main ways in the public policy literature. Firstly, the best-known approach which is conceiving of instruments as institutions. This approach is in the sense of organization available to government, for example, public corporations, independent of private sector contractors and public-private partnership (Moran et al. 2006: 470)

The second well-known approach focuses on the politics of instrument selection in the sense of ideas that shape the choice of tools. In other words, it is not crucial that government instruments are viewed as institutions, as long as what political or ideological processes lead to the choice of one policy instrument rather than another (Moran et al. 2006: 470).

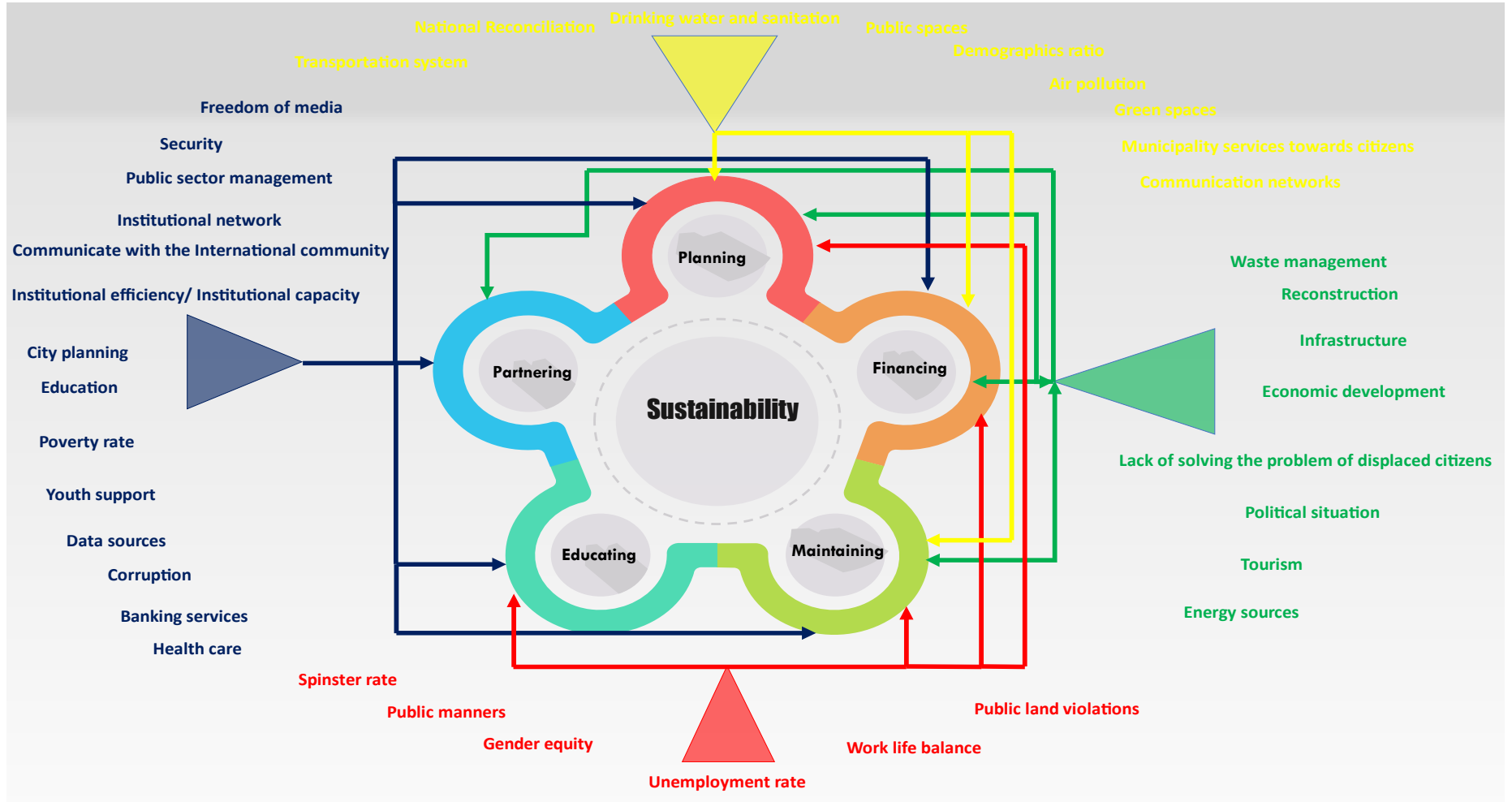
In addition to that, Moran et al (2006) argue that the third set of approaches to the instruments of government has tended to be institutional free with more focus on categorization of the tool into generic way rather than politics of instrument choice. On the other hand, these three-part classifications of approaches do not cover all possible ways of government policies (Moran et al. 2006: 471). The following figures 7.16 and 7.17 show the sustainability indicators for Amman and Benghazi respectively linked with government policy tools.

**FIGURE 7.16 THE SUSTAINABILITY INDICATORS FOR AMMAN LINKED WITH GOVERNMENT POLICY TOOLS**



**SOURCE: AUTHOR 2021**

**FIGURE 7.17 THE SUSTAINABILITY INDICATORS FOR BENGHAZI LINKED WITH GOVERNMENT POLICY TOOLS**



**SOURCE: AUTHOR 2021**

The figures above (7.16 and 7.17) show five policy tools that the local government in both cities (Benghazi and Amman) can apply to pursue sustainability indicators. The diagrams include four different colors of sustainability indicators (red, yellow, green, and blue). Each of these colors contains a number of sustainability indicators based on the policy tool recommendations.

For example, the diagram of the city of Benghazi shows yellow indicators such as Transportation system, drinking water and sanitation, air pollution and green spaces are indicators that the local government in Benghazi would need to apply three policy tools including planning financing and maintaining in order to develop sustainability plan in the city.

In addition, the indicators in blue color required all of the five policy tools. For instance, the indicators security, institutional network, and education are indicators that the local government in Benghazi would need to apply five policy tools including planning financing, maintaining, educating, and partnering in order to develop a sustainability plan in the city.

Although some indicators are repeated in both cities, however, the diagram of the city of Amman shows different policy tools are needed. For example, the indicator (Transportation system) is classified in the yellow color indicators for the city of Benghazi which means that this indicator requires three policy tools including planning, financing, and maintaining. On the other hand, the same indicator is classified as green color in the city of Amman.

This is according to the Greater Amman Municipality (GAM) argument in section 7.5 which emphasis that the main issue of the transportation system in Amman is the availability of funds that should support such major projects. Therefore, classifying the indicator of the Transportation system under the green color would include the partnering policy tool. This could be implemented by partnering with an international agent who is willing to invest in the transportation system in Amman.



## **7.7: SWOT ANALYSIS TECHNICS:**

In this section, the methodological framework ALISA be examined and justified by using the SWOT (strength, weakness, opportunities, and threat) analysis approach. This approach will be implemented to test ALISA's effectiveness and capability as well as finding the gaps for improvements of the methodology.

The testing of ALISA will give the ability to find out any improvements that can be done of the current framework in the context of the cities of Benghazi and Amman.

SWOT analysis approach has been selected for this examination due to its simplicity and practicality. According to (Pickton and Wright 1998), SWOT analysis has been praised for its simplicity and practicality. It is a situational analysis framework that is used to map out the most internal and external factors that can be currently affecting an organization, individual, or project based on the four factors (strength, weakness, opportunities, and threat).

As shown in the following table (7.1), the two internal and external factors (strength and weaknesses) are on the left-hand column and on the right-hand column is the external factors (opportunities and threat).

Dividing the four factors into two groups will help to understand how each point is classified. The external factors will be considered as largely out of control factors and can be used to specify objectives. On the other hand, the internal factors will be considered as largely in control factors and can be used to achieve the objectives which were determined in the external factors (Target internet 2020).

Table (7.1) illustrates the four factors of SWOT implemented on the ALISA methodological framework.

**TABLE 7.1 THE FOUR FACTORS OF SWOT IMPLEMENTED ON THE ALISA METHODOLOGICAL FRAMEWORK**

<b>Internal factors</b>	<b>External factors</b>
<b>Strengths</b>	<b>Opportunities</b>
<p>1- One of the strongest factors about ALISA is that it provides a framework where it gives the ability to develop sustainability indicators at two levels (local and institutional).</p> <p>2- The foundation of developing the sustainability indicators was based on information from the literature. This gives the ability to understand the existing knowledge related to the subject, and provides a solid foundation for the study and also frame the valid researcher methodology (Levy and Ellis 2006).</p> <p>3- Conducting information from three sources (literature, semi-structured interviews, and group discussions) gives the ability to ALISA to develop rich data of sustainability indicators. Also, the ALISA framework is based on the</p>	<p>1- Feedback is always an effective method to evaluate and work on improvements in any aspect. Therefore, the framework ALISA can also be improved based on feedback from participants who participated in the study.</p> <p>2- ALISA framework could be used as a tool to build bridges of knowledge between institutions and the local communities to establish knowledge and ideas regarding sustainability development.</p> <p>3- ALISA framework could assist in the development of institutions and assess current situations of any city. Also, it can help to create an introductory step towards sustainable development.</p>

<p>(UNCSD 2001) sustainability pillars, which include 4 aspects of sustainability rather than 3. This then assists to create a large space of sustainability indicators and helps to analyze the institutional aspect of governments.</p> <p>4- Due to the fact that ALISA was applied in a post-conflict city and a refugee crowded city, ALISA can then be classified as a flexible approach that can be applied in many situations.</p> <p>5- ALISA developed a list of sustainability indicators based on the use of the issue-based approach. This gives the ability to create solutions, strategies, and future plans for decision-makers. It also creates a foundation of regulations to start with in any future development plans.</p>	
<p><b>Weaknesses</b></p>	<p><b>Threats</b></p>
<p>1- In the use of the framework ALISA, it was essential to collect information regarding sustainability issues in</p>	<p>1- Due to the implementation of the (UNCSD 2001) sustainability pillars which include institutional indicators.</p>

<p>Benghazi and Amman from people who are working in the institutions and government. This included consultants, urban planners, lecturers, government, and decision-makers. This step gave the ability to create a list of sustainability indicators at an institutional level. However, the difficulty was in getting hold of the institutional people to interview and to gather information related to sustainability issues.</p> <p>2- Although ALISA was based on the (UNCSD 2001) sustainability pillars which gave the ability to analyze the institutional level. It can be argued that in some cases a complexity can be created.</p> <p>3- The process of developing sustainability indicators using ALISA required a consultation from sustainability experts to reform the objectives created into indicators. Finding experts in the field of sustainability can be a challenge sometimes</p>	<p>Discussing and criticizing such issues could be considered as a threat in certain contexts.</p> <p>2- Due to the ambiguity in the definitions of sustainability indicators (Tanguay et al. 2010), ALISA framework could have the threat of complexity due to the large number of challenges that could be collected during researches.</p>
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<p>depending on the place and the time of the study.</p> <p>4- The time needed to develop a full list of sustainability indicators using ALISA make sure that all issues of a city are covered could be longer than expected. However, in this research, the time of data collection was limited which might resulted to reflect the main issues of the two cities rather than a full reflection.</p>	
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### **7.8: COVID- 19 AND THE IMPACT OF THE PANDEMIC (MENA REGION):**

What is known to all of us is that the world has changed since the beginning of the pandemic in December 2019. The impact of the Covid-19 (Coronavirus) has potentially changed how we see the world, the ways in which we think, and how we conduct our lives. Nevertheless, the tragedy of lives lost, broken families, and scarred communities, as well as the impact on the economic and social changes caused by a pandemic-driven lockdown will shape a cultural legacy that will remain long in our memories and those of future generations (He and Harris 2020).

Regarding sustainable development, Hörisch (2021) argue that the pandemic has shifted attention away from the many prior challenges of sustainable development, most prominently the concerns regarding climate change (Hörisch 2021). On the other hand, van Barneveld et al (2020) argues that COVID-19 has affected humans differently to other crisis happened in the past. COVID-19 affected humans depending on their social class or caste, their gender and age, and the country where they live (van Barneveld et al. 2020).

In addition, in rich countries, many thousands have died and millions have lost livelihoods, on the other hand, in poorer countries, lockdowns have been imposed often with little prior planning. For instance, little attention was given to the economic impact of lockdown in India which affected day labourers and urban slum dwellers in the informal economy (van Barneveld et al. 2020).

Although the Coronavirus disease was classified as a pandemic on the 11<sup>th</sup> of March 2020, however, the first reports of its appearance in the Middle East and north Africa (MENA) came from Iran in late February. As of May 6, the disease has spread across the 22 countries in the region, with 224071 confirmed cases and 8378 deaths (Karamouzian and Madani 2020). Although many countries worldwide have been struggling with the consequences of the COVID-19, the situation in MENA is unique. This is due to the divisions caused by poverty and regional conflicts (Karamouzian and Madani 2020).

According to the OECD (2020) more than 2.2 million COVID-19 infections have been registered in the MENA region (including Iran, where more than 26,000 people have already died and infection rates continue to surge). Among Arab economies, Iraq has the most confirmed cases, followed by Saudi Arabia and Morocco (OECD 2020). On the other hand, observing the levels of health system preparedness across the region, MENA countries, the overall health management strategies – characterised by strict containment measures implemented in the very early stages of the outbreak, have proven efficient in limiting human losses and the spread of the pandemic in the region (OECD 2020).

### **7.9: COVID-19 IN BENGHAZI & AMMAN:**

Unfortunately, after the emerging of the second wave is which affected the Maghreb and the most fragile countries in North Africa and the Levant, some of which have re-established stricter measures (local lockdowns, school closures) to contain the virus from spreading too rapidly again (OECD 2020). It is obvious

that situation is different from the rich Gulf countries to the Levant or North-Africa fragile and conflict-affected countries such as Iran, Syria, Iraq, the Palestinian Authority, Yemen and Libya, where the lack of hospital beds and testing capacities is a cause of concern (OECD 2020).

According to the World Health Organisation (2021) report, Libya had 190146 confirmed Coronavirus cases. These statistics are updated until June 2021. In addition, the latest updates from Jordan in June 2021, confirm that the country had 745366 positive cases of the Coronavirus (World Health Organisation 2021). According to al-Warfalli (2020), (reporter at Reuters News Agency), the healthcare system in Benghazi is unable to receive patients that need ventilators. This is due to the weakness of the healthcare system in Libya (al-Warfalli 2020).

On the other hand, Jordan, which has an overall weaker health system than Gulf nations in the Middle East, managed to adopt a strategy similar to that of the Gulf Cooperation Council (GCC) countries. However, Jordan is hosting among the highest number of refugees per capita worldwide after Lebanon. It is home to 750,000 UNHCR-registered refugees, predominantly from Syria, which resulted in difficulties in accessing health facilities. Furthermore, many refugees live in densely populated camps or poorer urban areas with poorer health, water, sanitation, and hygiene facilities which caused environmental issues (OECD 2020).

Consequently, these issues justify the reasons why the citizens of Amman and Benghazi ranked health care as a high priority. The public health care sector in both cities Amman and Benghazi has been struggling with a number of challenges including lack of quality of services and management. Nevertheless, both cities had different contexts of challenges that led to effects on the healthcare sector. In the case of Amman, the city has been largely affected by the huge wave of refugees from the neighboring conflicts (Syrian crisis).

This effect also had an impact on public behavior in Amman. According to Mujahed (2021) people's behavior has changed towards public transportation and public green spaces. Nowadays people in Amman prefer not to use public

transportation facilities as well as reducing visits and activities in public green spaces and stay more at home as the government advised (Mujahed 2021). In the case of Benghazi, as a post-conflict city, many sectors have been affected including the healthcare sector. Although the number of confirmed cases in Benghazi was mild, it does not mean that the situation is controlled.

According to Ehdeed (2020), the Coronavirus could be catastrophic for those countries that are already ravaged by war and currently caught between bombs, shells, and the novel of the pandemic. The Libyan conflict, for example, has to leave the country highly vulnerable and fragile in its fight against COVID-19. In addition, only a small number of tests have been carried out by the Libyan National Centre for Disease Control (NCDC). This is due to the lack of national testing capacity which relies on the availability of other factors such as the availability of data and institutional capacity (Ehdeed 2020).

According to the information above, a justification of the ALISA framework is claimed. This is due to the fact that the sustainability indicators that the ALISA framework has developed reflect the actual local community's situation in Benghazi and Amman. Moreover, the effectiveness of the ALISA framework is the ability to be implemented in such a difficult context (Benghazi and Amman) which gives the ALISA framework the ability to contribute to the knowledge of sustainable indicators.

#### **7.10: SUMMARY:**

This chapter discussed and analyzed the data found in the two cases (Benghazi and Amman). It also included a comparison between the sustainability indicators that were developed using the framework of ALISA. According to the information above, a justification of the ALISA framework is claimed. This is because the sustainability indicators that the ALISA framework has developed reflect the actual local community's situation in Benghazi and Amman. Also, the effectiveness of the ALISA framework is the ability to be implemented in such a



difficult context (Benghazi and Amman) which gives the ALISA framework the ability to contribute to the knowledge of sustainable indicators. The next chapter will illustrate the conclusion of the research. This will also include examining the objectives of the research, answering the research questions and determining the limitation of the study.

## **CHAPTER 8**

### **CONCLUSION**

#### **8.1 INTRODUCTION:**

This chapter highlights the main findings of the study in the context of developing sustainability indicators at the local and institutional levels in the cities of Benghazi and Amman. This chapter also answers the research questions as well as illustrating recommendations for sustainability-related further studies and finding the limitations of the research.

#### **8.2 ANSWERS OF THE RESEARCH QUESTIONS:**

As explained in the literature review chapter, it is essential to have clear indicators to evaluate local sustainability. Yet in the meantime, there is a lack of both clear indicators and frameworks that can be developed to apply successfully at the local and institutional levels in cities in the MENA Region. Also, the lack of data available for some indicators for MENA countries, such as certain components of the sustainability pillars make it difficult to apply sustainability indices in these countries.

This constrains an essential issue for sustainability estimation which lead to the primary question addressed in this research as follows:

What are the challenges and barriers for cities in the MENA Region to become sustainable? in order to address this primary question, the research developed the ALISA methodological framework to assist in the process of developing local and institutional sustainability indicators in the cities of Benghazi and Amman and to be able to assess the level of importance of the indicators developed.

This primary research question required the development of an appropriate framework that can be applied in any city situation such as post-conflict and refugee crowded cities. According to finding suitable local and institutional sustainability indicators in the MENA Region, the methodological framework ALISA was effectively able to form a list of sustainability challenges and barriers in both cities Benghazi and Amman. Also, ALISA successfully categorized these challenges based on the UNCSO 2001 sustainability pillars.

In addition to that, the first secondary question which is “How can cities develop a framework using appropriate indicators from local level?”

This question has been answered through the development of the ALISA methodological framework which was used to develop sustainability indicators at the local level in two difficult situations (post-conflict and refugee crowded) by giving the local communities the opportunity to rank a full list of sustainability indicators. These indicators were also appropriate due to the fact that they were all created based on the local people's knowledge who are working in a number of different institutions in both cities.

In addition, the combination of the list of the challenges which were developed from three different sources (literature, group discussions, semi-structured interviews) gave the quality of the sustainability indicators more inclusiveness and effectiveness.

In regards to the second secondary question that was addressed in this research as,

“What kind of institutions and policies appropriate to MENA Region should be developed”?

To answer this question, a review of a number of references was used in chapter 7 which illustrates figures about the indicators that were developed for each city. These figures helped to compare the results of the research with the data that is already available in the literature. Developing and ranking the lists of

sustainability indicators gave the ability to figure out what kind of institutions should be focused on in two cities in the MENA region that are currently in difficult situations, as well as what is the priority of policies that should be taken in place to start any sustainability development process.

For example, the first sustainability indicator in the city of Benghazi was the unemployment rate. This then indicates that the 1st issue that the city of Benghazi's policymakers should focus on is creating job opportunities by making it possible for entrepreneurs to create a partnership with local and international partners. Also, this indicator was able to give an idea about which institution should be focused on in the city of Benghazi. This institution is the Ministry of Labour. This concept can then be applied for the rest of the indicators.

At the same level, the 1st sustainability indicator in the city of Amman was healthcare. Although when the process of data collection started in Amman in October 2019, there were not any signs of the diseases Covid-19. However, the citizens of Amman ranked healthcare as their first priority. This then indicates that if a survey was applied in Amman in the meantime, there is a very high chance that healthcare will be the most important indicator in the city. The same concept would be in the city of Benghazi. Even though the citizens of Benghazi ranked healthcare as their second indicator, there is a high chance that this indicator would be ranked as 1st in any near future studies.

These results also indicate that the priority policies for the city of Amman should focus on the healthcare sector which is related to the Ministry of Health. This then means that going forward looking at the whole debate on sustainable cities will be focused a lot more on health issues than the present. Therefore, the implementation of this concept to the rest of the sustainability indicators in both cities would clearly assist to find out which institutions and policies to work on in the context of the MENA region cities.

To sum up, this research has successfully answered the questions addressed at the beginning of the study. Also, the following section will clarify the objectives of this research as well as the limitation of the study.

### **8.3 OBJECTIVES AND GOALS OF THE RESEARCH:**

The general objective of this thesis is to understand the meaning of sustainability and to develop a framework that can be used to create sustainability indicators in two cities in the MENA region with unique circumstances. Developing sustainability indicators is essential due to the fact that it can be the foundation of any policy or decisions made by stakeholders and decision-makers that work as the main role in the process of development.

Furthermore, the goals behind the development of the ALISA approach is to create a list of sustainability indicators at the cities of Benghazi and Amman based on the institutional and local levels. To achieve such goals, a number of objectives were listed in chapter 1 (Introduction). These objectives are as follows:

#### **1. TO EXPLORE AND UNDERSTAND THE CONCEPT OF SUSTAINABILITY.**

In chapter 2 (literature review), a variety of definitions were illustrated regarding sustainability in general and sustainable cities in particular, as well as the classification of cities based on some characteristics such as population rate.

The Rio de Janeiro Earth Summit in 1992 is the international agenda that was signed by 178 countries. This summit involved the dimensions and aspects of sustainability and the eradication of unsustainable methods of production and consumption and approaches to eliminate poverty and improve the role of law and encourage civil and local societies to engage with the international community in the process of sustainability development.

A sustainable city is a city that enhances the efficiency of the usage of their resources in the more renewable base while concurrently reducing the harmfulness of pollution and the risk of unnecessary waste. Also, Sustainable cities should come to the same line with their "local Inhabitants development needs without imposing unsustainable demands on local or global natural resources and systems.

In addition, a smart sustainable city is a city that leverages the ICT infrastructure in an adaptable, reliable, scalable, accessible, secure, safe, and resilient manner in order to improve the quality of life of its local citizens. Also, to ensure tangible economic growth such as higher standards of living and employment opportunities for its citizens and Improve the well-being of its citizens including medical care, welfare, physical safety, and education.

Chapter 2 (literature review) illustrated the above information on the explanation of sustainable cities which is a city that is economically livable, socially harmonious, and environmentally well. Therefore, the first objective was reached successfully.

## **2. TO EXPLORE AND UNDERSTAND THE DIFFERENT PILLARS OF SUSTAINABILITY.**

This objective was achieved also in chapter 2 (literature review). According to the literature, there are different arguments with regard to sustainability pillars. Some of these included a fourth pillar which is culture, and in some other context government or institutions were presented as a fourth pillar. In general, most literature agreed on the main three-pillars which are economic, social, and environment.

In addition, chapter 2 (literature review) also, explored the SDG 11 (sustainable cities and communities) which contains 10 sustainability indicators that are linked with the UNCSD 2001 indicators as shown in table 2.7 in chapter two. The UNCSD 2001, summarizes the sustainability pillars into four pillars. These are economic, social, environmental, and institutions. Therefore, the ALISA

methodology was based on the UNCSO 2001, to ensure that institutional challenges are included and to explore the different issues in the institutional sector in the MENA cities. This then gave the ability to develop sustainability indicators that are related to the public and private sector and creating a clearer image from the local community regarding their view of the institutions in their cities.

### **3. EXAMINE WHAT ARE THE APPROPRIATE INDICATORS FOR SUSTAINABILITY.**

This objective was explored and achieved through the literature which illustrated a different list of sustainability indicators. These included the list of sustainability indicators illustrated by Arcadis 2016. The list of the sustainable development goals (SDGs) illustrated by the United nation 2015. Also, the UNCSO 2001 list of sustainability indicators.

Although these lists are illustrated in the literature review chapter, this research was based on the list of sustainability indicators illustrated by the UNCSO 2001. This is due to the fact that the UNCSO 2001 indicators included the four pillars of sustainability. By linking the SDG11 indicators with the UNCSO 2001 indicators in table 2.7, this research applied the UNCSO 2001 indicators in the ALISA framework as they include the four pillars in more details which gave the ability to the ALISA to explore the opinion of the local communities in more clearer elements.

It is understandable that each city has its own privacy and challenges. However, using the list of sustainability indicators created by the UNCSO 2001 was considered as a reference to the ALISA methodology. This reference gave the ability to all participants to understand the type of challenges that the research was exploring.

**4. To explore the different theories and frameworks of sustainability indicators development and to develop a conceptual approach to local and institutional sustainability assessment (ALISA).**

To develop a conceptual approach, this research explored a number of different frameworks as shown in chapter 2 (literature review). For example, Capital based (capital accounting framework), Systems framework, and Issue-based, a goal-oriented or thematic framework that was implemented in the ALISA methodological framework.

The chapter also illustrated the advantages and disadvantages of each framework which aided the choice of the framework. The choice of the issue-based framework was based on the fact that the ALISA framework was developing sustainability indicators based on the local communities' issues and challenges. Due to the concept of the issue-based framework which says "no policies without an indicator and no indicator without policy", the ALISA framework was able to develop an introduction to policies and decisions that can be framed to solve the challenges illustrated in Benghazi and Amman.

Furthermore, this research tested the ALISA framework in two difficult cities. The city of Benghazi is a North African case considered to be a post-conflict city due to the armed conflict that was in the city between 2014 to 2017 according to the European Union report on the city of Benghazi profile (2018). In addition, the city of Amman is a Middle Eastern case considered to be one of the highest refugee's host cities in the MENA region. These two unique circumstances cities have been the challenge of the effectiveness of the ALISA framework which was successfully achieved through the process of developing local and institutional sustainability indicators in both cases.

In addition to that, the issue-based framework was adopted by the UNCSA. This led to the choice of the combination between the UNCSA 2001 sustainability 4 dimensions and the issue-based framework. Also, the MENA region faces well-



known challenges such as low economic diversification, poor education systems, and infrastructure as well as the fragile and unstable situation in several MENA countries. Therefore, addressing these challenges in the context of sustainability manners is an urgent matter (OECD 2016).

It is arguable that the ALISA methodology framework could offer the tool to develop sustainability indicators to assist in any further sustainable development process in any city circumstances in the MENA region. Therefore, the 5th objective of the research is achieved.

#### **5 To apply the conceptual approach (ALISA) in one city in North Africa (Benghazi) and another city in the Middle East (Amman).**

To achieve this objective, and implementation of the ALISA steps took place in two cities with difficult context in the MENA region. Applying the 5 steps of the ALISA methodology, successfully achieved the development of sustainability indicators at the institutional and local levels in Amman and Benghazi. The results of the implementation of the ALISA methodology are shown in Chapter 5 (Benghazi city case) and chapter 6 (Amman case).

Based on the results of the implementation of the ALISA methodology, policies, recommendations, and comparison is shown in chapter 7. Therefore, this objective was successfully achieved in this research.

#### **6 To evaluate the effectiveness of the conceptual framework (ALISA) through the use of SWOT analysis techniques.**

After the implementation of the ALISA methodology framework in 2 different cases in the MENA region that have unique circumstances (post-conflict and refugees crowded), an evaluation analysis was applied in chapter 7 to ensure and test the effectiveness of the ALISA methodology. This was achieved through

the implementation of the Strength, Weaknesses, opportunities, and threats (SWOT). Therefore, this objective 7 was successfully achieved.

#### **8.4 LIMITATION OF THE RESEARCH:**

Although the ALISA methodology was successful in developing sustainability indicators in two different and difficult situated cities in the MENA region, a number of limitations to the study must be illustrated.

##### **1- TIME AND BUDGET.**

Since this research is a Ph.D. research, there have been limitations on the time and the budget for the data collection process. In order to provide broader lists of challenges in Benghazi and Amman, time and budget would be required. Therefore, this study successfully covered a variety of challenges in Benghazi and Amman, but on the other hand, if time and budget were provided in a broader manner, more results would have been covered.

##### **2- THE DEVELOPMENT OF THE INDICATORS.**

In order to develop a list of sustainability indicators, the ALISA methodology included steps 2,3, and 4 which are Objective formulation, Indicator preparation, and Indicator selection. These steps were implemented with consultation from urbanization and sustainability experts at the University of Benghazi and the Applied Science University, Amman.

Holding a broader meeting that would include different participants from different sectors would have given the opportunity to this study to identify broader opinions to the process of developing sustainability indicators for the cities of Benghazi

and Amman. These steps required more time to organize which in this Ph.D. research was limited as mentioned in the previous point.

### **3- COMMUNICATION WITH INSTITUTIONAL STAKEHOLDERS.**

The procedure of collecting information regarding challenges and issues at the cities of Benghazi and Amman included conducting semi-structured interviews and group discussions with people working in different institutions. In order to be able to conduct these meetings, a procedure of arrangement took place.

After the implementation of the data collection, it is arguable to say that getting hold of people working in institutions was not as smooth and easy as expected. There were always cancellations, delays, and rejections which made it difficult to collect data. In addition to that, the difficulties of the current situations in both cities made it challenging to organise and get hold of people working in the institutions in Benghazi and Amman. This matter had an impact on the limitation of time which was already mentioned.

In addition to that, political intervention was always involved in most discussions. Due to the instability and security issues in many of the MENA region nations, it was difficult sometimes to have an open discussion regarding sustainability and the challenges of cities. Also, a potential criticism is that we have limited ourselves to technocratic approach without addressing the fundamental political economy issues. While this criticism is to some extent valid, the main aim of this thesis is to explore ways in which a bottom-up indicator development process can be demonstrated in two very complex and challenging cities in the MENA region to contribute to better city level policy making to advance these cities towards sustainable development. The original contribution of this thesis is in the development of such a framework with 36 or 37 indicators representing the social, economic, environmental and institutional dimensions. There is scope for further research on how such an indicator development process can contribute to strengthening voice for those who are not represented in city level decision making and how this approach can be used as a dynamic consultation tool.

## **8.5 SUMMARY:**

Cities are complex systems. Therefore, there is a need for developing multiple and plural criteria for evaluation of the contexts and priorities to inform policies. By nature, people tend to focus on one perspective and neglect others. The effects of our decisions, unfortunately, have led people to destructive mistakes which affected the world economically, environmental, and social systems in a negative manner. Even though decisions in the context of sustainability intend to be positive, they might still create devastating situations after a certain period of time. Reforming cities towards sustainability is becoming a more popular topic than ever before.

In addition to that, the MENA region, of course, is no exception. In many opinions, the word of sustainability means "shiny tall buildings and fancy modern technology" in other words, most people and particularly at the local level in this research had an image of what the expression sustainability means. This meaning was always clarified as the city of "Dubai".

When looking at the sustainable development goals (SDGs) for example, it is clear to see that almost 100% of the world's cities and citizens would need to consider them goals as solutions to many issues in their communities.

Benghazi and Amman are no exceptions to this case. The MENA region in general has had a long term of instability for many reasons - political issues, security and social conflicts, economic challenges, and many others. Solving such issues with temporary solutions could result into a worse situation in many cases. Therefore, the need for sustainable solutions is essential to the MENA cities.

Observing the list of sustainability indicators in both cities. For example, the city of Benghazi sustainability indicators included Institutional Networks, National

reconciliation and Public behaviors. This indicates that there is an issue of social networking within the city of Benghazi. Referring to the issue of lack of monetary in Benghazi which according to the Libyan Minister of Benghazi is due to the lack of trust between citizens and government institutions. In the same manner, the city of Amman had a number of 36 sustainability indicators including Institutional publications and Public awareness. This also indicates that there is an issue of lack of social communication between citizens in the local community and the government institutions.

According to Lim and Putnam (2010) cultural religious traditions, in most societies, constitutes a large part of the general amount of social capital. As in the case of social capital in general, religious social capital contributes to the creation of interpersonal trust and fulfils a function of trust between people and institutions within the society (Lim and Putnam 2010).

Lim and Putnam (2010) argue that “religion assumes an important position in the societies’ political culture. It stabilizes the political order and, thanks to the religious social capital, it encourages political trust and political support of democracy. While structural social capital initiates trust-building processes, cultural social capital emerges from the contacts established within the networks. It reflects in how far people trust one another even though they have not necessarily had many previous encounters” (Lim and Putnam 2010 p: 72).

Due to the fact that Amman and Benghazi are societies integrated with religion, building social capital by integrating religious institutions would help to build social capital in both communities to develop trust between citizens themselves and their institutions. Building trust, social networks, and social capital in both societies would even assist the process of improving decision-making and policymaking in order to establish better policies that would improve people’s lives directly.

This research examined how to develop sustainability indicators for cities in the MENA region based on two levels (institutional and local). Having the ability to develop such indicators in two difficult situations (post-conflict and refugee

crowded cities) would introduce decision-makers and policymakers to start concerning sustainable solutions to their communities.

Exploring the ability to reform cities within the MENA region to become sustainable by adopting the appropriate framework, this research contributed to the form of knowledge on sustainability by developing the ALISA methodological framework that included the issue-based framework and the (UNCSD 2001) four sustainability dimensions.

This provided a flexible approach that facilitated the procedure of developing, classifying, selecting, and prioritizing sustainability indicators. These indicators can then be the guideline for any future process of development towards sustainability solutions for the current situation in the Middle East and North Africa.

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[communities#:~:text=Make%20cities%20and%20human%20settlements%20inclusive%2C%20safe%2C%20resilient%20and%20sustainable.&text=For%200all%20of%20us%20to,and%20culturally%20inspiring%20living%20conditions.](https://www.globalgoals.org/11-sustainable-cities-and-communities#:~:text=Make%20cities%20and%20human%20settlements%20inclusive%2C%20safe%2C%20resilient%20and%20sustainable.&text=For%200all%20of%20us%20to,and%20culturally%20inspiring%20living%20conditions.) Accessed 1 May 2018

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# APPENDICIES

## APPENDIX 1

### Survey Questions for Benghazi/Amman City:

1. Name: \_\_\_\_\_
2. Today's date: \_\_\_\_\_
3. Address: \_\_\_\_\_
4. City, \_\_\_\_\_
5. Occupation ( \_\_\_\_\_ )
6. Sex: Female Male
7. Please indicate your area of knowledge:
8. Please indicate your level of education:

Primary

Secondary

BSc. Or bachelor

MSc.

PhD

Other: \_\_\_\_\_

9. How long have you been living in Benghazi city?

0 to 5 years      5 to 10 years

10 to 20 years      All my life

10. In your view what are the three main problems for citizens in Benghazi/Amman?

11. If we were to make Benghazi/Amman a sustainable city, what are the three things we should do first?

12. Have you ever contacted the Municipality of Benghazi/Amman? If yes, for what purpose?

13. Now I am going to show you a list of sustainability indicators. These have been identified by citizens of Benghazi/Amman like yourself. Please select one of the five ranking levels of sustainability indicators for the city of Benghazi/Amman presently:

[List to be inserted here].

**Note:** Not Important=1, Less Important=2, Important=3, Very Important=4, Vital=5.

14. Do you have any questions or comments related to my study?

Thank you for your co-operation.

## APPENDIX 2



### Focus Group Interview for Benghazi/Amman City.

#### Sustainable Cities in the MENA Region. Local and Institutional Sustainability Indicators Assessment Framework.

**Student name: Serag M Abdelgalil El Hegazi.**

As a PhD student at the University of Bradford, part of my on-going research into sustainability at the level of Benghazi city in Libya/Amman Jordan, I am carrying out a focus group interview discussion and a survey regarding the issues and needs of Benghazi city in relation to the smartness and sustainability future.

Your views are important to this research and it is important for the research that you respond and cooperate with the discussion to have a full view in relation to sustainability for Benghazi /Amman.

Notes:

1: It is vital to know that the discussion will be audio recorded. This record will be the backup of the information provided (Y/N).

On the other hand, participants have the right to refuse to be recorded and all the information shall be only written on separate sheets.

2: Participants have the permission to write their names, positions, name of institution and address if they wish to. If participants are refusing to provide such information, please write N/A (not applicable) in the following gaps and move to note 3.

Name:

Name of institution:

Position:

Address:

3: Participants, who do not wish to provide personal information, please be aware that each member will be referred to as (X).

For example, participant one will be referred to as X1, and participant two will be referred to as X2 and so on.

4: Participants are welcome to receive a summary of the results of the research once it is accomplished. Would you like to receive a copy of the summary of the results via e-mail? (Y/N)

## Focus Group Interview Questions.

The main goal of this research is to develop an approach that will create a set of appropriate sustainable indicators for the city of Benghazi/Amman. This would be accomplished through clarifying the problems and needs which the city of Benghazi/Amman is facing in the short and long term. During this discussion, the following questions will be asked.

Q1: In your personal point of view, how do you define a sustainable city?

Q2: Who are the key stakeholders involved in the making of Benghazi/Amman a SC?

Q3: What are the challenges that the city of Benghazi/Amman has experienced so far with SC?

Q4: The following list of indicators was created by the United Nation Commission on Sustainable Development (UNCSD), which of these indicators do you think is relevant to the city of Benghazi/Amman? And can you recommend any extra indicators that would fit the case of Benghazi/Amman?

<b>SUB-index</b>	<b>Indicator</b>	<b>Indicator description</b>
Social.	Education	Literacy rate. University rankings. Share of population with tertiary education
Social.	Health	Life expectancy. Obesity rate. Nutritional Status. Sanitation. Drinking water. Health care delivery.
Social.	Demographics	Dependency ratio.
Social.	Equity	Gender equality. Poverty.



Social.	Affordability	Consumer price index. Property prices. Living conditions.
Social.	Work–life balance	Average annual hours worked.
Social.	Security	Homicide rate. Crime.
Environment.	Environmental risks	Natural catastrophe exposure.
Environment.	Green spaces	Green space as % of city area. Forests. Desertification.
Environment.	Energy	Energy use. Renewable share. Energy consumption per \$ GDP.
Environment.	Air pollution	Mean level of pollutant.
Environment.	Greenhouse gas emissions	Emissions in meter tonnes (per capita).
Environment.	Waste management	Solid waste management (landfill vs recycle). Share of wastewater treated.
Environment.	Drinking water and sanitation	Access to drinking water (% of household). Access to improved sanitation (% of household).
Economic.	Transport infrastructure	Congestion. Railways infrastructure. Airport satisfaction.
Economic.	Economic development	GDP per capita.
Economic.	Ease of doing business	Ease of doing business index.
Economic.	Tourism	International visitors per year, absolute and per capita.
Economic.	Connectivity	Mobile connectivity. Broadband connectivity. Importance of global network.
Economic.	Employment	Number of people employed, % of city population.
Institutional.	Institutional framework.	Strategic implementation of SD.

		International cooperation.
Institutional.	Institutional capacity.	Information access. Communication infrastructure. Science and technology. Disaster preparation and response.

Source: United Nation Commission on Sustainable Development (UNCSD)

Q5: How does the city of Benghazi/Amman cope with the challenges of socially, economically, environmentally and institutionally?

Q6: How do you know you have succeeded and how do you measure success? And what would success look like in the city of BenghaziAmman in the future?

If there is any extra information please do not hesitate to discuss and share with participants.

**Thank you.**

## **APPENDIX 3**

### **Semi-structured interview questions for Benghazi city/Amman:**

As a PhD student at the University of Bradford, part of my on-going research into sustainability at the level of Benghazi city in Libya/Amman Jordan, I am carrying out a semi-structured interview regarding the issues and needs of Benghazi city in relation to the sustainability future.

Your views are important to this research and it is important for the research that you respond and cooperate with the discussion to have a full view in relation to sustainability for Benghazi /Amman.

Notes:

1: It is vital to know that the discussion will be audio recorded. This record will be the backup of the information provided (Y/N).

On the other hand, interviewee has the right to refuse to be recorded and all the information shall be only written on separate sheets.

2: interviewee has the permission to write his/her name, position, name of institution and address if he/she wishes to. If interviewee is refusing to provide such information, please write N/A (not applicable) in the following gaps and move to note 3.

Name:

Name of institution:

Position:

Address:

3: interviewee, who does not wish to provide personal information, please be aware that each member will be referred to as (X).

For example, interviewee one will be referred to as X1 and participant two will be referred to as X2 and so on.

4: interviewee is welcome to receive a summary of the results of the research once it is accomplished. Would you like to receive a copy of the summary of the results via e-mail? (Y/N)

**Semi-structured interview questions:**

What is the role of this organization? And what is your role within this organization?

In your personal point of view, how do you define a sustainable city?

Who are the key stakeholders involved in the making Benghazi/Amman SC?

What does Benghazi/Amman achieve as a SC? And why is it important?

How do you measure the performance of Benghazi/ Amman as a SC?

What are the challenges that Benghazi/Amman have experienced so far with SC?

What challenges do you expect in the future of Benghazi/Amman as a SC?

In the following list of indicators, which indicators are you currently working on or applying in Benghazi/Amman? And what is the biggest challenge in those three indicators?

## APPENDIX 4

### CONSENT FORM

Title of Project: **Sustainable cities in the MENA Region.**

Name of Researcher: **Serag El Hegazi**

Please initial all boxes

1. I confirm that I have been informed by the researcher the nature of this study and I understand the information given to me. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
  
2. I understand that my participation is voluntary and that I am free to withdraw at any time without any given reason.
  
3. I understand that all information given in this study will be looked at by the research with his/her supervisors and any authorized person from the University of Bradford. I give permission for these individuals to have access to the information that I provided.
  
4. I agree to take part in the study.

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name of Researcher

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature