

**DEVELOPMENT OF A STRATEGIC FRAMEWORK FOR OPTIMUM LAND
UTILIZATION IN THE QATARI PUBLIC SECTOR**

DECLARATION

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

Signed ABDULRAHMAN MOHAMMED ALKHAYARIN (candidate)

Date 28 July 2020



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This thesis is the result of my own investigations, except where otherwise stated. Where correction services have been used the extent and nature of the correction is clearly marked in a footnote(s). Other sources are acknowledged by footnotes giving explicit references. A bibliography is appended.

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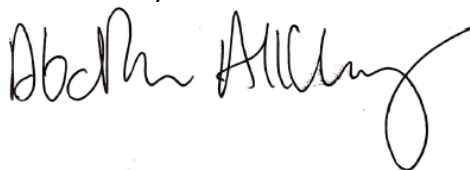


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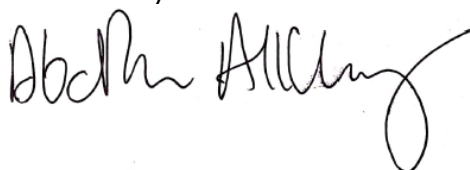


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Abstract

Exploring Strategic framework development for optimum land utilization in the contemporary Qatari public sector is the aim of this research. Objectives of the study target critical comparison of frameworks available for sustainable development of land. Current land-use practices are required to be investigated as well as these are evaluated for sustainable development. Moreover, recommendations were required to be offered so that optimum land use can be ensured.

Literature sources show that for the accomplishment of strategic objective or vision 2030 land sustainable land development is quite important. However, literature in land development of Qatar is an under-researched area.

For the accomplishment of these objectives mixed methodology and pragmatism philosophy is selected. Survey questionnaire data is accumulated from 100 respondents and 50% of participation was done by public sector employees, whereas 50% of participation was done by private-sector employees.

The results showed that awareness of land use has the potential to positively affect land development and therefore sustainability can be enhanced. Benefits and impacts have the potential to affect strategy development in this regard. Interview data was sourced from 16 participants. The results show that there is a need for improvement in Qatari Land development strategies. Many of the respondents have rendered opinions that the majority of land development is devoted to religious activities and buildings. Thus, there is a need for commercial land development strategies. Respondents have also recommended that land is underutilized and new land should be sold out to investors, who can utilize it positively rather than keeping the land vacant. Land development reforms should also be developed as these have the potential to affect the economic output of the country in positive terms.

One of the limitations faced in the study is based on budget constraints, which have created issues in accessing researches available on a paid subscription. Limitations regarding resource availability have also affected the inclusion of a large sample of respondents.

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Chapter 1: Introduction

The land is one of the limited and indispensable resources to fulfil economic, social and environmental targets (Deininger, 2011). The increased development in the nation is related to the population growth and industrialization as well as urbanization has increased the pressure on the land. The haphazard or unplanned use of resources of property can affect the land development, and different use of land can also lead to significant adverse effects. Both for emerging countries or developed countries, inappropriate land management can lead to substantial issues, which can affect sustainable development. As demonstrated by the researchers, effective land management and planning is required to ensure sustainable development. The critical review of studies indicated that effective land management is based on technical and scientific processes and strategies for land use can summarise the demands of the future (Calbick, Day, and Gunton, 2003). This is associated with considering the intense process of planning with the involvement of different stakeholders and communities, which can provide strength to resource allocation and decision-making related to land use.

The increased land pressure can impose significant challenges to ensure sustainability. It is crucial to develop a viable solution to ensure the appropriate use of land resourcing by following sound guiding principles (Chigbu and Kalashyan, 2015). In this regard, it is also required to support development sectors of the organisation for achieving targets such as industrial development, infrastructure development, mining and tourism with the use proper planning and guidance related to sustainability. Besides, it is essential for supporting a social event such as rural communities with the help of securing lands and addressing different issues related to improper land management. The evaluation of land use demonstrated that there are some significant issues, which can affect the utilisation of the land resource (Oduwaye, 2013). One prime issue is that land is an indispensable and limited resource, and there are social, environment and economic pressure regarding the protection of these resource area.

According to Alawadi, Khanal, and Almulla, (2018), the process of land utilization planning also involves the evaluation and assessment of social, technological, political, economic, biophysical aspects of the land. Long and Qu (2018) indicated that objective behind the land use planning in an effective way is to control, regulate and influence the changes and to maintain the sufficient environmental quality of the land along with successfully promoting the conservation of resources. Chigbu and Kalashyan (2015) indicated that the diagnosis of the area and the development of

practical management framework of land utilisation processes results in developing comprehensive information related to the development of policies contributing to the sustainable development of economic and social development of a region. The methodological procedure for the effective land utilisation planning provides toward the sustainable economic and social activities related to the land development and successfully addressing the property rights issues and indicating the utilisation of resources that are required to retain for prolonged environmental sustainability (Calbick, Day, and Gunton, 2003).

Successful management of land use and land use planning should consider a strategic environmental assessment, to find all the specialities and diverse points of view to incorporate the most relevant landings for an adequate territorial ordering process. Without doubt, to determine sufficient land use, it is a complex task and requires a consensus, complex actions and also to incorporate adequate and up-to-date legislation to assess and adequately preserve the country's natural resources. According to the research study conducted by Grant (2016), land use planning is one of the critical options for effective distribution of resources and utilizing the public lands for the welfare of the public and improving the wellbeing of the society through different public sector initiatives. Moreover, it also offers a diverse range of environmental, economic and social aspects and therefore requires a logical step for addressing the challenges of the utilisation and management of land. According to Drewes and Van Aswegen (2013), land utilisation planning process requires a comprehensive and in-depth knowledge related to specific technical skills and approaches that could result in developing holistic strategic frameworks addressing the needs of the urban as well as rural settings. Long and Qu (2018) indicated that land use distributions and planning for effective utilisation also results in identifying diverse market interventions.

It is essential to develop the solution by using the orderly as well as the scientific disposition of resources of the land. Also, there is a need for systematic processes for dealing with the issues of property and threats to ensure that land resources are used optimally. The similar land management and effective use of land issues are faced by Qatar (Silberstein and Maser, 2013). For this purpose, the main focus of this research is to present a strategic framework, which can assure the optimal utilisation land in the public sector of Qatar.

1.1 Research Background

As demonstrated by the research studies, the optimal management of land resources is an essential matter of consideration. The ineffective utilisation of land in Qatar is one of the prime public sector issues, which must be addressed as soon as possible. The focus of the current research is to present a practical strategic framework, which is developed for ensuring the land utilisation in an optimum manner (Oduwaye, 2013). In the current year, Qatar has undergone several improvements in the economic conditions, and this has increased the opportunities for the country and has also attracted the attention of investors both from the private as well as the private sector to invest in the economic policies of the country. “Sheikh Tamim Bin Hamad Al-Thani, Emir of Qatar” in this regard has presented the National vision 2030, which is related to the economic development of the country by considering different issues and risks. Considering the case of Qatar, it is clear that Qatar has undergone significant economic growth during the last few years and this has resulted in the attraction of several investors to make investments in different sectors in Qatar. The economic boom has also increased the opportunity of improving the use of land by the public sector in Qatar (Calbick, Day, and Gunton, 2003). This economic development has also enhanced the awareness of public sector for bringing reforms in land management and develop and implement an appropriate strategic framework, which can ensure optimum use of land Long and Qu (2018).

1.1.1 Public Sector Land in Qatar

According to the national legislation of Qatar, public sector land is considered as a moveable or immovable property that holds the possession of public legal entities or to State. These entities are assigned to the utilization and planning of the public land for public benefits. In addition to this, public sector land in Qatar is not allowed to be used for any kind of legal transaction and entitled to any type of acquisition of a tangible right. Moreover, public sector land is not utilized or acquired against the situations identified by the law of Qatar.

As identified in “*Law No. 10 of 1987 concerning Public and Private State Property*” the seashore, lakes, salt marshes, ponds that are linked to the seas are considered as public sector land according to the law of Qatar. Likewise, it is also identified that area that is interlinked with seas, water canals, swamps, ponds, and water channels is also entitled as public sector land. In addition to

this, streets, roads, lanes, public squares, areas use for public means of transportation are also taken into the title of public sector land. Moreover, according to “*Law No. 10 of 1987 concerning Public and Private State Property*” following are the vital lands that are considered as public sector land in Qatar:

“Ports, harbours, marinas, docks, marine basins, bays, navigation channels, and marine dams. Water canals, streams, underground and aboveground water channels, and water tanks intended for general distribution.

Telephone and telegraph wired and wireless public communications networks, electricity networks intended for general lighting, public radio and television transmission networks, and tools, equipment and installations of these networks.

Fortification, defence and land installations in areas of fortifications, arsenals and military camps, weapons and war material, warships, vessels and boats.

Real estate and real estate by destination, allocated to the Emiri council, the ministries, government interests and public legal entities.

Public museums, monuments and libraries.

Mosques and Friday mosques, subject to the provisions of Islamic law relating to the endowment.”(Article 3 Law No. 10 of 1987 concerning Public and Private State Property)

According to the law, the Department of State Property is held responsible for the overall administration of the private real estate of the State. However, any land that is allocated for public benefits to a public authority, the government department of Ministry shall be administered by the responsible authorities to which property is assigned. Moreover, the allocation of public sector land held prerequisite to the approval of the Emir.

The sustainable growth in the economy of Qatar has resulted in the development of diverse sources for income has encouraged private and public sectors to ensure their participation in economic development. Furthermore, economic policies are also revised, and new investment regulations and laws are introduced for providing financial opportunities to the public, which will bring improvements in the process. This has also improved the awareness of the public regarding the management of resources, including land to bring positive reforms. The prime purpose of actively engaging the public sector is to ensure the tremendous improvements in the development of society. Considering the significance of land resources, it is clear that the government has to ensure that land is optimally and adequately utilised and can lead to improvements in the development of

human beings (Rayment, 2017). Considering this context, the strategic framework is essential not only for managing land but also to ensure that optimum use of the property is carried out. The public property must be utilised for general welfare and establishment of schools, hospitals, colleges, civic organisation or irrigation purpose, which can ensure the well-being of people and also assist in the overall growth of the country. This is also demonstrated in the national goals of Qatar, and the government can only ensure the success of these national development goals by managing resources and the safe and effective use of land.

1.1.2 Impact of Land Management

As demonstrated by Rayment (2017), the land is the prime source, which acts as a foundation for bringing economic benefits for the countries such as Qatar. It is also associated with the development of social networks and the growth of local government. The land is demonstrated as the primary sources, which can promote economic growth and activities and bringing improvements in the economy of the country. The area is considered as the prime part of the national development system. Taking into consideration the significance of land, strategic development of the public sector of Qatar is essential for dealing with different issues related to land management, such as ineffective use of a property. Strategic growth is also developed to develop an appropriate framework by using land policies and regulations, which can manage the use of land. The land policies must be designed for effective management of the property and overcome imperfection related to land use. Drewes and Van Aswegen (2013) also mentioned the need of considering policy development for optimum use of land as these policies could ensure the implementation of some essential strategies and regulations, which can be used to overcome negative consequences related to improper land management (Noah, Abdulganiy and Moshood, 2018). Considering the case of Qatar, it is imperative to have a clear policy, which can bring improvements in the efficiency of processes used for land management. The leading role is played by the decision-makers and policy analysts to develop a transparent approach, which can ensure land management and optimum use of land to avoid the adverse consequences and economic losses due to land mismanagement.

As demonstrated by Drewes and Van Aswegen, (2013) related to property management, the public sector is involved in managing land can affect government policies to manage resources (Drewes and Van Aswegen, 2013). The framework for the land management and optimal use of property, therefore, consider the involvement of public sector to improve the process of land management and ensure that intense and adverse use of land due to increased population is avoided. For this purpose, the integration of technological advancement and knowledge management must be carried out to utilise all related opportunities. The use of optimum land utilisation framework will ensure sufficient investment inland to make the use of land secure. In the present time, if appropriate practices and context are not developed, it can lead to failure of land management approaches. It can result in land conflicts and grabbing, which can affect the economic development of the country (Noah, Abdulganiy and Moshood, 2018).

1.1.3 Role of the Public Department

The role of the public department has been shown by different researchers and findings of their studies mentioned that the public sector authorities could lead to optimum utilisation of land from social and economic perspective and provide the implication of property rights (Noah, Abdulganiy and Moshood, 2018). Development and implementation of the strategic framework would lead to an improvement in the satisfaction and confidence of property holders, and they make the proper investment in the use of land. It can also assist in making the investment, which can ensure sustainable growth in the economy. Furthermore, strategic development and excellent land acquisition can also bring improvements in the land distribution for effective land distribution and reducing the chances of unequal distribution of land to reduce the chances of productivity losses. Besides, the public sector can ensure the implementation of land management strategies and policies, which can improve land productivity (Alnouri et al., 2018).

1.2 Problem Statement

The issue in this context is that Qatar lacks effective planning for the integrated use of land and the instrument to plan land use is carried out to limited potential, and this presents optimal land use as a severe core issue. Besides, the absence of uniform framework organisational capacities,

institutional structures, financial resources and human capacities offer constraints for planning and management of land use. In this regard, the problem statement related to this research study, “What are the benefits of land reforms in the public sector of Qatar and how effectively the strategy framework development would ensure the optimal use and management of land to assure sustainable development of the public sector in Qatar?” Considering the critical review of country condition as well as critical literature has presented the fact that plan related to sound and sound use of land is required for meeting the needs of optimal land use. This must be accompanied by the intense process used for planning by the active involvement of different stakeholders and communities to provide strengths to process of decision making related to the use of land resources and allocation. In this regard, it is the responsibility of the country, state and district to develop the optimal planning for using the land.

1.3 Research Questions

The primary research question related to this research is “How can a strategic framework be recommended to ensure the optimum use of land for sustainable development in the Qatari Public sector?”

1.4 Aims

To develop a strategic framework to ensure the optimum use of land for sustainable development in the Qatari Public sector.

1.5 Objectives

- To critically compare the frameworks for land use for sustainable development.
- To investigate the current land-use practices and their impact in the Qatari public sector.
- To evaluate these practices from a sustainable development perspective.
- To recommend a strategic framework to ensure the optimum use of land by Qatari public sector for sustainable development.

1.6 Significance of the Study

According to Long and Qu (2018), land utilisation is one of the critical policy domain that results in affecting the progress of social, environmental and economic goals of the country. Moreover, the effective use of land also influences public welfare and wellbeing. Likewise, with the effective utilisation of land, public sector and regulatory authorities play an essential role in the control and regulation of utilising the area for constructive purposes. As a concept, land utilisation management is relatively one of the new ideas in many developing countries. Few of the research studies related to land management and effective utilisation of land and efficiency of public sector organisations have explored this concept with a comprehensive approach, however in European or developed countries. For instance, a research study conducted by Rayment (2017) examined the role of public sector organisations in the UK. It indicated that adequate planning for land utilisation results in influencing the efficiency and performance of the dynamic social and economic growth of the country. Another research study conducted by Alawadi, Khanal, and Almulla (2018) identified different factors affecting the effective planning for land utilisation by the public sector of the UAE. According to the study, the current challenge that is witnessed by UAE public sector organisations is not the development of the strategic framework, also the requirement for effective land management practices and adopting the methods effectively and efficiently. Therefore, Chigbu and Kalashyan (2015) in research work signifies the execution of further research work related to effective practices described to land utilisation and the role of public sector organisations to adopt these factors effectively and efficiently. Moreover, different public sector entities witness different challenges related to the active development of strategic framework related to land utilisation, specifically factors related to policies development and multi governance issues that lead towards the development of challenging situation for public sectors organisations.

As related to this scenario, it is anticipated that current research work will result in making an essential contribution towards the current knowledge body through exploring the diverse implications related to effective land utilisation practices and the role of public sector organisation in the land development initiatives in Qatar.

Empirical research work related to land utilisation practices such as those conducted by Calbick, Day, and Gunton (2003) and Silberstein, and Maser, (2013) have emphasized mainly on the practical implementation of land utilisation practices within the public sector institutions. Other

researchers have emphasized on quality management role on land administration. In contrast, many research studies related to the role of public institutions in land utilisation planning such as those of Kim (2011) and have been focused on equipping resources for integrating towards land management and administration.

Therefore, this research study recognizes land utilisation strategic framework development for land management and administration, thus offering diverse opportunities for public sector institutions in Qatar to evaluate and assess their stance and outlook towards land utilisation. A few empirical research work related to the field of land use, such as conducted by Deng, Li, and Gibson (2016) have emphasized on the influence of land development initiatives by public sector organisations on economic development of a country or the impact of land utilisation planning practices on importance of property rights among households. In short, the identified research studies have determined that active role of public sector organisations in land utilisation planning results in developing economic conditions of a country and suitable utilisation of lands resulting in social, environmental and economic development.

However, the current scholarly resources and work lack the integration of delivering comprehensive insights related to the role of public sector institutions in the effective utilisation of land for making the productive land management policies in the areas that require identification of well-defined and secure land rights through assuring excellent functioning, optimum household asset ownership and increased level of productivity of the lands.

The current research work contributes towards making positive contribution related to existing information in land utilisation planning and role of public sector organisation through delivering a comprehensive qualitative and quantitative analysis of the strategic development of the public sector for effective utilisation of land in Qatar and increasing economic development and growth of the overall region.

The practical significance of the current research study revolves around the promotion of developing understanding among decision-makers in public sector institutions of Qatar related to harnessing and nurturing resources that will result in enabling them for identifying the strategies of effective land utilisation planning practices resulting maximizing the benefits for improving the strategic framework ensuring optimum utilization or management of land.

The primary assumption associated with this research study is that land utilisation framework practices are taken to be an activity that is adopted by the public sector organisations of Qatar for

achieving land development policies. With this regards, land utilisation practices are seen as activities that result in improving the overall development and growth of a region. However, due to different challenges with the process of developing a strategic framework, the role of public sector organisations is affected towards the effective utilisation of land and leading towards the economic and social development of Qatar.

1.7 The rationale of the Study

The rationale behind the execution of the current research study is the uniqueness of the research as it includes the exploration of land utilization implications related to a developing country that is Qatar and will offer comprehensive insights related to successfully institutional land reforms can be initiated by the public sector institutions to improve the investment inland.

Moreover, this research study aims to execute empirical analysis of primary data related to the significance of strategy development of the public sector for optimum land utilization in Qatar for economic development and growth. It will support public sector institutions of Qatar with comprehensive insights related to maximum productivity through optimum use and how effectively the government can manage it. In addition to this, current research study revolves around the identification and integration of meaningful findings and literature related to the effective utilisation of land and role of public sector organisations and offering opportunities for future studies to explore and expand the results of the current research implications.

1.8 Brief Methodology

The study uses a mixed approach and uses quantitative and qualitative methods to determine the impact of optimal land-use strategy development on national economic growth and the general well-being of ordinary Qatar households. Besides, current research uses exploratory research strategies to gather information from primary and secondary sources. Survey and interview methods are used to determine how people think about the best use of Qatar's public sector participation countries through a practical strategic development framework. Secondary data collection sources are also used to determine the importance of Qatar's public sector's practical strategic approach to optimizing land use. Both primary and secondary sources will be used to assess the significance of a possible strategic plan to the best use of the Qatar public sector to

ensure sustained and sustainable economic development and growth. Among the main research methods, study participants were randomly selected to understand the public sector's strategic development framework for Qatar's optimal land use and to study the published research data to collect secondary research data by assessing the strategic development framework for Qatar government resources in the country's best land use (Nafi, 2013).

1.9 Scope

The coverage of the current research study focuses on identifying the effectiveness of participation of Qatari public sector organisations in the national economic development by developing a strategic framework of optimum utilization of land (Kubursi, 2016). In this regard, a current research study explores the specific aims and objectives for investigating the approach of institutional reforms to be executed for assuring optimum utilization of land by Qatari public sectors. In addition to this, this research involves the usage of primary and secondary sources of data collection qualitatively and quantitatively to investigate the research results and to analyse what contribution public sectors make in the national economic development and welfare of households in Qatar (Nafi, 2013). This research work provides comprehensive, meaningful findings related to the effective utilisation of land and effective governance of area in Qatar.

1.10 Chapter structure

The current research work has been structured and organized into five major sections that are titled with distinctive names and possess meaningful information related to the phenomenon under study. Following main chapters are included in this research:

Chapter 1 Introduction: This subdivision of the current research work provides knowledge of the foundational components of the study including research background, aims and objectives of the study and research questions of the survey that are utilized for systematic executing of the research.

Chapter 2 Literature Review: This subdivision of the current research work focused on a comprehensive and critical review of the past scholarly resources and integrating a detailed analysis of several research studies. This section of the study elaborates the findings of the previous scholars to develop a vivid understanding of the background of the related aspects of the research.

Chapter 3 Research Methodology: This subdivision of the current research work is Research Methodology that includes identification of different tools and techniques used for the execution

of the research in a structured way. This chapter allows readers to go through the research approach, design, data collection method and methods for analysing the collected data.

Chapter 4 Findings: This subdivision of the current research work focused on the integration of findings of the study attained through the collection of data.

Chapter 5 Discussion of the Findings: This subdivision of the current research work focuses on data analysis and findings and analysing the collected data and offering meaningful information to advance the existing knowledge base related to a detailed study on how effectively land in Qatar can be used by the public sector to gain maximum productivity through optimum use and how effectively the government can manage it.

Chapter 6 Conclusion, Recommendation, Limitation, and Further work: This subdivision of the current research work will conclude the entire study and provide readers with insights related to the main findings of the study. In addition to this, the last chapter focuses on identifying meaningful recommendations and suggesting other researchers about the implications of future research work.

1.11 Summary

This section of the study focuses on identifying the foundational aspects of the research including identifying and exploring the background of the study and integrating diverse elements and implications that are related to the development of a strategic framework for land utilisation in the Qatari public sector. In this section of the study, aims and objectives and research questions are identified that will be addressed in the next chapters of the study. Moreover, a brief methodology of the study is identified that indicates the execution of the study with a mixed research method. Subsequent chapter of the study focuses on exploring the critical review of the past scholarly resources and integrating a detailed analysis of the several research studies.

Chapter 2: Literature Review

The chapter presents a theoretical understanding of the key findings derived from different studies to give a theoretical basis of the topic area under consideration. With the aid of theoretical and empirical information, critical information is presented to develop a critical understanding of the topic. Literature gap is showing under-researched areas of previous studies, which can be explored on the premise of this study, and findings can be used to omit this research gap. The conceptual framework is provided in the research, which is revealing the research design and possible research outcomes. The use of this theoretical framework is feasible to get a conclusive overview of the whole investigation. The potential research outcomes are showing the findings, which can be expected by the researcher, and these can influence the strategies used by public sector firms. The hypothesis is developed to explain the theory, which needs to be verified in this research to explore the research problem descriptively.

2.1 Theoretical Review

2.1.1 Land Utilisation-Basic concepts

2.1.1.1 What is Land?

According to Salazar et al., (2015), the land is an overall capability of a land surface along with all the symptoms below its surface that are related to its utilisation for humans. The definition shows that land is a landscape as the principal capital of activity, as a place where all living things are located and live their lives by utilising the area itself. While, on the other hand, according to Qi et al. (2018), land use is an effort to use land from time to time to obtain results. Moreover, the definition of the area according to the physical geography is, land that remains in its environment and the physical quality of the soil determines its function (Popp et al., 2017). According to the term, industrial land is a natural source whose value depends on production; the property is a commodity that has prices, benefits, and costs. As for Martínez-Sastre et al., (2017), all human-made equipment (infrastructure and buildings) are also part of the land.

What is the land use?

According to Kite, et al. (2016), in line with the development of the city and the activities of its population, the land to the town is plotted according to its designation. Huang et al. (2015) suggest that urban land use shows the division in space and the role of the city. Land use according to

Langemeyer et al., (2016), it is said that urban land use is classified as follows; (a) settlement land, including a housing including yards and sports fields; (b) service land, including government and private offices, schools, health centres and places of worship; (c) company land, including markets, shops, kiosks and entertainment venues; and (d) industrial land, including factories and printing.

Land use according to Hu et al., (2016), land use is classified into; (a) residential land; (b) trading land; (c) agricultural land; (d) industrial land; (e) service land; (f) recreational land; (g) worship land and (h) other lands. Groeneveld et al., (2017) classifies land use intending to find out the productivity of land (agriculture) as follows; (a) agricultural area consisting of technical irrigation, semi-technical irrigation, simple irrigation, lawn/garden, pond, timber plantations, forests; and (b) non-agricultural land, consisting of buildings and yards, dry area, etc.

2.1.1.2 What is land use planning?

Hu et al., (2016) indicated that land-use planning includes an allotment of land for a particular function and the amount of volume of activities permitted on a property that will vary in each city area according to the characteristics of events and related problems. This fact directs how a region should be developed and well defined. The allotment of the use of space or land in a place is directly adjusted to the related problems, and how should an area or zone be developed. Abdullahi and Pradhan (2016) conclude that land use needs to consider two things, namely consideration of general aspects and pedestrian activities (street level) that will create a more human environment. Furthermore, according to Acheampong and Silva, (2015), it is said that land-use planning is a process of resource allocation carried out in such a way that all layers of urban society can feel the benefits. This planning is related to land-use policies that will determine the relationship between the plan and strategy. A land-use plan made concerning land-use policies will determine the relationship between the project and approach will determine the proper function of a particular area.

Brown, Sanders, and Reed, (2018) said that in general land use-planning tools should be taken into consideration to implement the plan through focusing on public facilities that are held primarily through capital improvement programs by preserving early control of public land. Moreover, it is also imperative to focus on development regulations. According to Briassoulis (2008), rules for land use planning involve ordinances that govern zoning, regulations on sailing, and other legal provisions regarding development. These regulations, according to Long and Qu (2018), are

guarantees that development activities by the private sector or public sector adhere to standards and do not deviate from land-use planning policies.

Leadership and coordination, according to Groeneveld et al., (2017), are also important aspects of land use planning. Even though it is somewhat more informal than a capital improvement program or development regulations, according to Rayment (2017), it can be more useful to ensure that ideas, data, information and risks regarding community growth and development are included in the decision-making among private developers and government agencies that serve the public interest.

According to the research study conducted by Affolderbach, and Carr (2016), put forward that a land plan is already a tool for implementing policies and the suggestions they contain as long as they are all open and not out-of-date as a continuous direction for indifferent decision-making of both government and private. A way to execute effective land-use planning is by reviewing, compiling and ratifying, the plan from time to time. Another way is to create a continuous circuit between the project and the implementation tools to realise the project.

2.1.1.3 Central Idea in Land Use Planning

According to Briassoulis (2008), land use planning involves global organisation and utilisation of land resources in a specific period in the administrative areas and fulfilling the requirements of economic and social development. Alawadi, Khanal, and Almulla (2018) indicated that the essence is to realise the rational allocation of limited land resources among the national economic departments, that is, the spatial and temporal distribution (quantity, quality, location) between the departments of land resources, correctly employing land use structure. According to Groeneveld et al., (2017), land resource allocation refers to the distribution of the quantity, quality, and location of land resources between departments. Moreover, according to the notion of Chigbu, and Kalashyan (2015), time, space, purpose and quantity are the four essential elements that make up the allocation of land resources.

According to Langemeyer et al., (2016), the overall land use planning is a programmatic document for urban and rural construction and land management. It is the basis

for implementing land use control and is an essential means of achieving the most stringent land management system. Huang et al., (2015) put forward that the land use master plan is based on the overall and long-term interests, takes all the land in the region as the target, and makes global arrangements for land use, development, rectification, and protection.

2.1.1.4 Principles of Land Use Planning

Land use planning refers to a process and preparation of strategies for an alternate of land utilisation. The plan allows companies to develop the best land consumption policy. The principal objective of land use planning is the division of land to meet the social and economic needs of society and other stakeholders while safeguarding the resources of the future. Land use planning enables companies to make use of land in a way to support social goals of development (Hamdouch et al., 2016).

Long et al. (2014) have noted that rapid urbanisation is affecting the land negatively. The area is a fundamental economic resource that is not renewable. Sure, that sea may be pushed back to clear the land for feeding the construction activity; however, the activity fuels to the damage being caused to the sensitive eco-system. According to Nelson (2014), pushing back the sea to avail the seabed for construction is not a very viable option. The sea shall fall back in place, even if some chemical is used to soak it. It cannot be sponged off entirely because of a simple matter of logic, one-third of this world is made up of water, and this water level is increasing by the day. This happens because of the impacts exhaled into the sky from the fumes caused due to a human being created economic activity (Harvey, 2018).

Kraaijenbrink et al. (2017) have summed on the impacts of glacier melting and loss of land due to rising sea level. Although, the glaciers that cover a significant part of our property are quickly melting the process is causing a massive inflow into the oceans. Are far away from Qatar. Nevertheless, it is a position on the global map makes it vulnerable to floods and rising sea level, which is rapid, particularly in the light of rampant economic activity. Anderson et al. (2015) have observed that several islands that about a decade ago were visible over the sea surface have sunk. The author has researched in the context of Hawaii and found that the coastal areas have suffered and people of the city have lost pleasant beaches to the rising sea level. Rising sea level added to the pushing back of sea for land use has resulted in the frequent floods. Pushing sea back or drying it off does not mean that the chunk of world sea-land ratio has been diminished. No, the division

is natural and sea has a force to push back the opposing side and pull it in. Is this then the reason for frequent flooding?

According to Spanger-Siegfried Fitzpatrick and Dahl (2014), massive floods wreak havoc, create chaos and damage the society by costing it economically. Middleton, N.J. (2017) Qatar bearing a landscape in desert form is also experiencing its limitation of land due to ever-increasing sand storms. Shepherd et al. (2016) theorise that sand storm is also the cause of changing ecological environment due to human activity in the region. Rapid and unplanned construction, dangerous pollutants being exhaled into the sky by human activity in the form of fuel-guzzling and fumes belching transport system. The industrial spread of Doha that is home to thousands of foreigners who, although are changing the economic activity of Qatar nevertheless they do not have to pay long-term damages that the ecological front of Qatar is facing due to industrial activity Shepherd et al. (2016).

Land, an already limited precious resource of water-surrounded Qatar is getting shorter by the day due to natural causes like floods, waterlogging, and sand storms are forcing the Qatari government to come into action and take preventive measures. The Highness Sheikh Tamim Bin Hamad Al-Thani, Emir of Qatar under Qatar vision 2030, has explored the policy regarding land development in Qatar. Land planning before the event is also necessary because the unplanned zones shall crop up economic activity here and there. Causing massive traffic jams, loss of fuel and increased carbon emissions that shall ultimately affect Qatar through influences of global warming. As per authors Zaina Zaina and Furlan (2016), the Qatari government is the role model for its citizen's; it has the power to channel them through the division of law. Land development has several stakeholders; some of them are powerful and cannot be controlled by any but the government.

Authors Brown de Bie and Weber (2015) pointed out that these stakeholders include land buyers, developers, and ultimate land users. Planning the policy means that the Qatari government needs to take into account the buyers demands that sway the land usage by the land developers. As noted by Haque and Asami (2014), there is another side of the picture land developers developing the assigned land being developed using universally defined principles regarding land management. The developers must design as per the policies. Qatari government must use its power to devise a strategy. Through this policy, it can govern the zoning by type within a city, several alleys between communities. Size of the alleyway, methods adopted to reduce the ecological impact on the

environment (define a tree ratio per driveway). Routes are connecting a community with other community, alternative ways—the size of these roads.

Rizzo (2014) has explored in his research that master planning is spanning over the years and keeping in mind the current growth rate of population. In addition to economic activity have always helped spawn megacities that are considered an epitome of society. Kaphengst (2014) has explained that this is the reason that mega-cities are being developed using the following principles. They are called five pillars of best land management, and the Qatari government should take into account these principles. Following are the principles

Productivity

One of the crucial principles of using land is to enhance productivity from the use of the property. To increase productivity, construction companies can conduct situational analysis and plan around the physical characteristics of the land. The land is a scarce resource that must be utilised with responsibility. The land-use planning should be conducted to sea level. According to Metternicht (2017), the decline in the productivity of land has encouraged companies and increased pressure on the effective use of the property. To enhance the use of land and make it productive, it is essential to formulate clear objectives and recognise stakeholders to assure they are positive participation. It has been observed that land-use planning often fails because of inappropriate and standardise the use of global implementation strategies and models. Land-use planning must not be a standardised practice; companies should localise the plan analysing the local situation of the region.

Schwilch Liniger and Hurni (2014) have covered this principle by claiming that land division based on socio-economic use covers all the aspects prevalent in the society. Rich people want to buy of land, develop it and sell it, rich people. This greed deprives already underprivileged sections of the society relying on the small pieces of land for their earning. Usually, lack of technology and capital these small growers are only able to rear and farm raw level based food items. The items help sustain society's hunger nevertheless cannot help achieve secondary needs. Qatar already is a dessert country; as such, land management becomes even more critical because of the scarce availability of land. The government must consider area demand-based activities against the productivity of the field this shall help it in zoning the property, keeping in mind the unfair distribution of land. Hagos et al. (2014), in his book, mentioned the importance of land

productivity. They enlightened the value of sustainable development and declared the compromise of productivity at the cost of sustainability as justifiable.

Security

Janssen-Jansen et al. (2012) highlighted the need for land use planning to deal with the collapse of a property development system that occurred in the result of uncertainty challenges and financial turbulence. Effective land-use planning enhances the competitiveness of counties and cities. They stated that an inappropriate plan of land utilisation has been amongst the significant reasons in the cancellations, delays, and intensification of projects.

Hamdami, Sasanifar and Akbari (2013) mentioned that improper land use planning district ecosystem. They voiced against the increasingly deteriorated practices and ecologic problems of land utilisation. The study highlighted that loss of land productivity and degradation are amongst the most prominent factors that are posing a threat to the environment and land itself. The lack of attention towards the potential use of property, water resources and its capacity result in imbalancing the natural situation of the area. The security principle of land use planning allows authorities to effectively use natural remedies to lead companies to an achievable level of sustainable development. According to Al-Thani et al. (2019), the demand for land is increasing in Qatar for residential purpose and commercial developments. The property in the region has become slightly expensive due to its scarcity to people. Therefore, it is pivotal to use the land effectively. Even in a current scenario, in Doha, which is the capital of Qatar, 80% population resides. Neither this land is sustainable or secure, nor it comes in the liveability indexes of multiple international cities indexes.

Nyanga Kessler and Tenge (2016) authors found that prevailing economic conditions of Qatar and the productivity of the land's effect on it should dominate Qatar's GDP. Raw goods of daily usage including dairy, food items, vegetables, animal rearing for edible meat uses the same land as the factory chugging out secondary assets in finished form. It is possible to establish such factories on a piece of infertile land. Because the property is just not the piece of land that we can see apparently. The natural trees, animals living on that piece of land, ponds lakes and underwater reserves all play an essential part in maintaining the natural eco-system. Therefore, Qatar's government must keep the role played by the productivity of land in the sustainable economic development of this world for an extended period. Policy regarding zoning can help in this regard.

Protection

Popp et al. (2014) talked about the protection of land use. They stated the importance of focusing on land utilisation while planning for land use. Land utilisation is a huge source of global warming, as it contributes to sustainable carbon emission. Deforestation is an increasing trend to enhance the land for residential area, but deforestation brings environmental protection issues. Muchane et al. (2012) focused on improving the knowledge of land use planning for increasing the protection level. They detailed on the decomposition of organic matters for protecting the land from issues such as soil macro-fauna. Mahiny and Clarke (2012) stated that land use should be a smart approach to using different models. They commented that safeguarding the green space and forecasting the influence of developments are some of the significant factors that help in protecting the land from adverse effects. The study concluded that different area contains different types that should be handled by modifying and organising. The land-use planning must include the latest technologies and tools to protect the land from negatives of land use. Mahmud et al. (2012) took a distinct approach and presented degradation as a vulnerability factor and threat to security and protection of land. The study stated that to protect the environment and improve the quality and quantity of property, some elements are necessary to consider—for example, sustainable management of natural resources, biodiversity conservation, disaster management, and watershed protection.

Nkonya Mirzabaev and von Braun (2016) noted that through governmental policy, Qatar might be able to save the distinct species of the plant or animal growing or living on that piece of land. It is not necessary that an ugly or useless looking plant or animal, just because until now it remained unknown, have no uses. This plant or animal loss may play a vital role in the sustenance of future generations.

Viability

Viability refers to the successful use of land that is beneficial for stakeholders and the development purpose. Arhurst and Noronha (2009) discussed the viable use of property and imperatives of the improved environment. The study mentioned that effective land use planning and mandatory measure towards environmental protection or pollution preventions are some of the cost-effective strategies for the development of viable future land utilisation. Successor viable land-use demands the use of techniques that can help companies at the development and exploration stages.

of new technologies di one of the best ways to assure the viability of projects. Morokong et al. (2018) preferred to discuss the role of invasive alien plant species (IAPs) in complicating the experience and increasing the cost of maintaining land in its productive stage. The study emphasised in clearing the IAPs to enhance the productivity and viability of the property. The study proposed that early restoration of farms is a smart approach and works well to strengthen the sustainability of land rather restoring the when the area is heavily degraded. The study also stated that countries could intensify their agricultural productions to enrich the economic viability of their land use.

Fleskens Nainggolan and Stringer (2014) have been defined as the long-term use of land. Economic activity is done using the area. Thereby, the clarity of the government's policy shall help zone the space and create an economic activity that can help sustain Qatar in the long- term. A balance between primary and secondary activities is different from different economies of the world. Developed countries use technology to enhance the production from the fundamental level of activity; therefore; their mix of land usage can fall in favour of secondary economic activity. Qatar, in contrast, is a developing economy and hence has to ensure that it is self-reliant for primary goods. Viability of land is a part of effective land use planning and counts as a mandatory principle that must not be overlooked.

Acceptability

The land use must be acceptable, and it contains vast importance in the field of land utilisation. This means that the positive outcomes of the projects are necessary. Projects that have less impact on the environment are considered acceptable. For making the fair use of land, it is pivotal to use renewable energy that is followed by the sustainable utilisation of soil. Acceptable projects demand successful planning, decision-making processes, and implementation of those processes. These factors donate to the successful completion of land use. Acceptance of land use encourages companies to make use of innovative technologies, define effective measures, and define the appropriateness of projects. In sustainability science and land utilisation, acceptance has gained tremendous importance. Therefore, it is essential for concerned authorities that they focus on enhancing the approval of their projects or land utilisation through improving their sustainability (Busse and Siebert, 2018). Gamborg et al. (2012) pointed out the acceptability of land use as an ethical issue and concern. The study highlighted that people are using bioenergy production

techniques to increase their production. Still, the use of this technique gives rise to ethical issues and reduce the acceptability of projects. The bioenergy competes with the use of other lands that gives rise to ethical issues. The reasons that reduce the acceptability of land use in term of bioenergy production include the direct and indirect competition of the technique with food production. Secondly, bioenergy production may lead countries towards deforestation. Further, the changes in land use may bring pessimistic impact on the emission of greenhouse gas. Bioenergy utilisation poses significant challenges to the security of land use.

Kawy and Darwish (2014) have explored that the acceptability of land usage always changes due to the social and economic conditions that prevail in the country. Third world countries are still prone to population going overboard and expanding to unusual limits. Therefore, there comes a time when consumption for primary goods shall outstrip the need for secondary products. Such conditions shall increase the prices of primary products, and if not produced according to population, the costs may go beyond the reach of the masses.

2.1.2 Land Utilisation policy

Fleskens and Stringer (2014) have researched and found that the government has a significant role to play in the land use policy. Charting and clarification of the procedure and meting out severe punishments in case of not following the procedure shall severely deteriorate the economic and social sustainability of society. Zoning of the city shall play a significant role in how they generate toward the economy of the country. Zone planning is the brush that paints the picture of society. Further, the image then shall help in playing the major sustaining all the classes of the community. Capital market is the fuel to social and economic imparity in the region. It is this principle that ensures that the wealthy get wealthier still and the poor gets poorer. The government's role in this regard is essential through devising the policies and then forcing its implementation can help avoid exploitation of poor of the society.

Gatto Wollni and Qaim (2015) critically evaluated the role of policy in helping avoid exploitation of poor. The government devises strategy and government has the power to control the non-compliance to the land management policy by the rich of Qatar. Land developers have the resources to buy several pieces of land keep them undeveloped; create the temporary land supply shortage causing massive changes in prices. Increased prices shall disable the middle-class buyers to purchase homes to live in. Similarly, small farm owners may also fall victim to land developers.

Warriner (2014), have summed that land management policy's enforcement shall help alleviate farmers trouble with land developers. Land developers intent on buying land without caring about its fertility or support for sustaining an economy of the Qatari society in long-term shall lose the pieces of fertile land. Loss of property shall affect the original item's production, causing the miss-balance within the organisation to increase. The farmer has lost his continuous source of income; with it gone, he cannot sustain his living style; hence, increasing his suffering because of lack of imposition of land management policy. The other side of the picture becomes apparent when reduced supply of essential consumption items grows the prices because of the widened gap between the demand and supply. This can create unrest in society.

2.1.3 Land Utilisation models

Cellular Automata

Basse et al. (2014) have found that the use of this model can be helpful continuously. Because it uses four principles cell space, cell states, time steps, and transition rules, space is the piece of land and before being zoned possible impacts on the surrounding areas of property due to particular development may change the entire region's planned use due to interaction with development. For instance, if a road is built through a forest to connect the remote areas of the country with an economic hub. It is possible that after some time, houses and supporting commercial activity will crop-up along both sides of the road.

Artificial Neural network

As per authors, Qiang and Lam (2015) recent development in computer and software industry have led to the development of an algorithm that can predict maps of land-based on its historical development and interaction with several events predicts future face of the land. This method shall give an idea to the kind of socio-economic conditions that might happen due to the mix between the technical development and primary usage of land.

Economics-based models

Lawler et al. (2014) have noted that the model is the best usage of the SLM principles. It helps in creating economic outcomes based on the mix of land usage. Land usage can be for the primary activity or secondary activity both lead to economic development. However, a balance between

the two is necessary because economic growth cannot be attained without achieving technical development.

Nevertheless, technical development's sustainability can be devised by the efficient usage of resources. Resources are natural and not renewable. Therefore, their minimum usage and maximum output creation should be seen. This can be achieved through this model, thereby enabling the Qatari government to use the inefficient land way.

Agent-based model

Villamor et al. (2014) have examined and found that this simple to use model is based on the judgment of an agent. Land usage is determined based on the responses of an agent, gathered through surveys or questionnaires. The respondents are stakeholders related to land use, and therefore, the model is realistic. Based on the response from change agents, the land's usage and impacts of development in the future may be anticipated.

2.1.4 A critical comparison of the various available models

Cellular Automata versus Artificial Neural network

Islam, Rahman and Jashimuddin (2018) explained that the changes in land use affect the integrity of the ecosystem. The negative influence on land can be severe against the changes. Hence, it is critical to use effective models for land use planning. He stated that Cellular Automata is a combined chain to predict procedures. The model uses images to define the starting point to change simulation. The primary focus of this model is on the sustainability of land use. However, ANN is a multilayer model that sense imagery through remote classification.

Cellular Automata model relies on the methods of trial and error, while ANN relied on the empirical evidence and relationship between drivers and land use. In Cellular Automata model, transition rules are transparent, and users are liable to define these rules clearly. At the same time, in ANN, people are not responsible for determining the rules clearly and making them transparent. Making a distinction between the models is an essential part of the research so they can be effectively applied to a particular situation to enhance the protection, acceptability, and security of land utilisation.

Further, the evaluation of these models can be done based on their characteristics. ANN has some features irrespective of logic and style of implementation. For example, ANN contains a large number of the neuron that includes processing elements. These processing elements contain a massive amount of weighed association between them. The relationship or connection between these elements provides a distributed representation of data. The model enables companies to implement a learning process to acquire knowledge related to land utilisation. The model calculates the transition by its neural networks, and these are invisible to its users. ANN is an automated system that contains an ability to perform land use classification. This system also helps in the creation of training patterns and generalising these networks. ANN gains priority on traditional models of land classification because of its ability to evaluate the statistical abnormal distribution. The primary reason for designing the ANN model was to analysis of land use and recognition of patterns. The model also contains some different advantage over the statistical methods. For example, the model is simple as compared to any other model because of its quality of the requirement of non-parametric information. The model does not require users to have any prior knowledge of land utilisation. The principal characteristic of the model is its image classification. The model contains an ability to sense remote data (Yuan, H., Van Der and Khorram, 2009).

Despite having multiple advantages to land utilisation, the model contains some operational issues that include the complexity of the network architecture and the size and quality of training data sets. For example, the training data set must offer a complete representative description of each category of land. Through this approach, the size of the property can be increased with an increase in the shadowy variability in the desired classes. It lacks the desired accuracy that is required to take decisions related to land variability of desired levels. ANN is trained with boundary patterns, thus contain lower accuracy of training patterns. Another issue is that in ANN, a specific application already defines the numbers of output and input nodes. Therefore, it lacks in a multi-layer networks application as compared to other models. Another issue is that in a single layer, identification of hidden nodes is also a problem (Yuan, H., Van Der and Khorram, 2009).

The quality of the abundance of geospatial and modern geographic metadata revealed new possibilities for building large-scale land-use change (LU) simulation models. Cellular Automata theory (CA) greatly assist in the creation of models where transition and the possibility of changing

land use are expressed through well-established mathematical rules. Cadastral data offers companies with a broad framework for calibration of the model. This opportunity of using CA enables companies to have a look at a realistic representation of the boundaries where land-use change is expected, and the cadastral metadata database provides additional information. Information on owners, property rights, current land use as well. The new vector CA model primarily uses spatial and descriptive spatial data to produce a reliable model for land use in the geolocation of urban and peri-urban areas. The cellular automaton system also incorporates new elements into the process of decision-making (Gounaridis et al., 2019).

Cellular automata model plays a vital role in predicting and understanding the patterns of land and evaluate the process of land use. The evaluation of the land-use competition is mandatory because the local community competition related to land use influence the utilisation of land use in the respected industry. To evaluate the game, the land use is defined through cells and particular state is transited to multiple directions. The cellular automata model defines competition relationship model that exists between the neighbouring and central cells. The model evaluated the consistently changing intensity of land use and proved to be a dynamic parameter.

Economic-based model vs the agent-based model

Lawler, et al. (2014) observes that the economic-based model of land management focuses on the management of efficient usage of resources to create sustainable economic activity. The model describes economic betterment could be achieved by relaying to the social and ecological features of the land. That is to say; the property is a resource that can sustain economic activity; therefore; its limited use should be able to generate higher output that also takes into account social and ecological factors. This is a broader view of the economic activity rather than a shallow agent-based result arising from an agent-based model that according to Villamor, et al. (2014) manages the land-based on responses of an agent. This is an issue, firstly the view is narrowed by the sample size, and secondly, the sample (answers from the respondents to survey about possible land use) may not reflect the actual beneficiaries of the land management. Hence, supporting the illegal usage of land that may not be in harmony with the kind of soil or other natural reserves it plays host to or even part, it might play in the overall economy of Qatar.

In Qatar's environment, Economic-based model may be more useful since several factors cause the limiting factors to widen. Qatar's land is constrained by natural disasters (floods, sand storms,

and waterlogging and salinity). Apart from land management, division of policy based on the principles of sustainable land management is also very necessary. The developers of the land are rich and powerful on the other hand; the country is home to foreigners who work in the region thereby, they do not own it. This sums to the fact that their concerns for the sustainable economic development of Qatar are of little or no interest to them. They are just helping the commercial and financial activities expand. This then means that the environmentalists, natural habitat and water reserves are the only determinants that can be contrasted against the economic activity creators. The model is the only one of the above mentioned to consider the socio-economic parity—sustainability of the current economic activity through efficient and fair distribution of society.

2.1.5 Critical considerations in global land-use practices

Bestelmeyer et al. (2015), has found that increasing global warming. Its effects on the glaciers and natural eco-system are causing loss of land through natural disasters fueled through unplanned human activity. The consumers who drive value have forced giants like Coca-Cola to use the resources wisely. Plastic being dumped into the river is causing damage to marine life that is important to help maintain a balance between the aqua systems. The system, in turn, affects the plates that make up the earth's crust.

2.1.6 Key drivers in global land-use practices.

For sustainable use of land resources and their management, it is pivotal for companies that they focus on understanding the dynamics of land use. Land utilisation is directly associated with the development of sustainable development of some geographical areas that include the biotic condition, landscape condition, flow of energy, and other physical characteristics of the land. One of the significant drivers of land-use practices is environmental sustainability. The construction industry is a big source of emission and poses significant threats to the environment. The increasing demand for environmental management and ecosystem protection are the factors that require smart utilisation of land. These practices allow companies to protect the inefficient use of the property and address land-related issues. The major problem that people face in land use when it comes to the agricultural field is the erosion of soil. Some other drivers of the land-use practices include habitat degradation, degradation, and wetland conversion. Land-Use methods enable land users to deal with these issues. Land use practices allow companies to effectively use the biophysical resources such as agricultural resources, industrial use, agricultural use, and logging. Land use

practices provide information to the users and offer them an opportunity to make informed, rational decisions that are based on the sustainable use of land. These land-use practices are effective in environmental monitoring and determining the processes that are necessary for the effective use of a property. The methods enable users to gain geo-information and conduct analysis to have altered information related to the regional dynamics and the use of land and its changes (Msofe, Sheng and Lyimo, 2019).

Changes in land use have become a significant factor. Increasing population and scarcity of natural resources are two of the major factors that encourage companies to use new practices of land use. Effective land-use methods enhance the capacity of land utilisation and benefit their concerned parties. Due to increasing population, the land is also becoming a scarce resource as the demand for the property is rising. Therefore, it became essential for companies that they use such practices that enable them to make efficient use of land, and they can gain maximum benefits while using less area. Another issue that drives the need for land-use practices is the loss of bio-diversity. Land use has been subject to interventions and natural environment; therefore, understanding drivers of land utilisation is a critical aspect for planning land-use. Land use practices allow understanding the cause-effect relationship that helps to mitigate the issues. The knowledge of these causes helps in classifying the change use of land. It has been assessed that currently the expansion and intensification of agricultural land is a result of a growing population. The increasing population have increased the demand for property and associated resources such as food supply and income. Other reasons that have become the drivers of land-use practices include the rising conflicts and blurry tenure of land that is associated with the higher income desire. Changes in the agricultural policies have been a driver of land-use change that has led companies towards the use of modern practices. Further, some economic factors such as incentivisation for the prices of crops has resulted in the transition of land use models from traditional to contemporary. The demand for extensive cropping has increased that has also encouraged the protection of wetland and cultivated land (Msofe, Sheng and Lyimo, 2019).

2.1.7 Key challenges and constraints in global land-use practices

Boserup (2014), have put it well about the causes of underdevelopment of the society. Educating the rural population to make them see felling of trees or overfishing is distorting natural ecosystem. Efficient and effective land management and development can help control this. Widening

socioeconomic reasons are the causes that shall affect the global economy. People to earn more concentrate on economically developed areas. The areas to accommodate the incoming traffic shall have to use the resources. Resources, particularly the moveable ones, shall be imported from underdeveloped society, which shall disrupt the eco-system of that country. Weak economy quailing under the power of a developed country may not be able to manage the land use sustainably.

Hertel (2016), in his research, mentioned that land tenure is a crucial challenge to land-use practices. Companies must establish their land use tenure so the land-use methods can easily be applied. Improved mapping of land tenure can be a helpful technique to improve land use and can be a beneficial land use technique. Sequestration is a land-use practice that may enhance the prices fo food; hence, it counts as a challenge to the methods to maintain the use of land adequately while keeping the prices. Environmentally damaged property is a challenge for land users; the land-use practices may be expensive and enhance the cost that would reflect in food prices. Hence, land-use preparations must contain careful use of land that may not improve the rates of property. Competition for land often leads to higher land cost that reflects in the products. Evaluating a match and making the right decision is an aspect that helps in effective land utilisation. Game is a challenge to land-use practices. Land use practices donate to the betterment of environment and cost reduction. However, it does mean that land-use methods can resolve all the issues; these practices contain some limitations. For example, change in governmental policies and uncertainty due to the introduction of oil prices can be the uncontrollable factors that can lead the land-use practices towards the arousal of challenges. Land use practices aim to improve the efficiency of land, but the external factors can be amongst the biggest challenge. High fixed cost of contracting area is also a challenging factor, as in such as land-use practices can not help reducing the cost of food.

Payne (2019) agreed that climate change, globalisation, and increasing population are drivers of land-use practices. He stated that security of land tenure, regulatory barriers, the rise of neoliberalism, and the political economy of land are some of the challenges to land management or land practices. The study identified conflicts on earth as the most common factor that calls for the need for land management practices. However, the legal and dual system of land tenure is a challenge for both residents and policymakers while developing policies related to land practices.

Land-use practices become a challenge for land users if they land in the legal authority of the land. Ownership of the property can be a restricting force, instead of being a benefit for land users. Therefore, to avoid the challenges of land-use practices, governmental support is essential. Governments must promote the range of tenure options that can help users of land in meeting the diverse needs of people.

2.1.8 Guidelines and Frameworks for optimum land-use

Del Prado (2015) mentioned that land-use planning management legislations have a more significant impact on the use of land. Careful observation and compliance in implementing the laws can support optimum land-use practices and lead to effective land management. Transferring and developing the property, planning standards, administrative and regulatory procedures, and registration of processes are some of the critical factors that have a significant influence on the performance, quality, and efficiency of the land markets. These principles have been decided by the professional in the industry, but have not been sufficient for multiple territories. Compliance with the laws and completion of these procedures can enhance the use of land and reduce corruption. The measure in result will increase the land management and effectiveness of land-use practices.

It is suggested that proper planning should be done to improve land use effectiveness. While planning the land use, economic development and social interactions should be considered. Innovative approaches must be regarded as an interest of public and private sectors must be taken into consideration while developing partnerships. Following these guidelines can help companies and land user in land management and practices.

Enemark et al. (2014) have surmised the impacts of land registration toward sustaining socio-economic parity caused among the society because of land being registered in the name of developers. The policy should clarify the land use disclosure at the time of registration of a piece of land by the buyer buying the property after several subsequent transfers—particularly the piece of land that has not been subjected to industrial production's junk yet. Because of feature, no matter how small can sustainably fund primary activity. Animal rearing or agricultural produce can be performed on the short pieces of land, and the resources generated through that activity may help sustain a middle-class household. This revelation means that land registration plays a very significant role in helping curb the broadening gap between social and economic factors.

According to author Gunnoe (2014), part of the policy, is the taxes earned by the landowner through activity being performed on the land? Qatar government can enact greener laws regarding land management to curb the land usage that helps destroy the eco-system of society. Developer buying the property for profits over society's benefit shall think twice before accumulating a large swath of land by acquiring small pieces from poor people. Taxes on activities that create a high level of pollution shall help avoid increased impacts from global warming on the entire global society. Further, the charges shall also help prevent the spreading gap between the economic and social disparity in society. High taxes on a particular harmful activity has always helped being hindered by law barriers.

2.2 Empirical Review

2.2.1 Land use practices and sustainable development –Benefits

De Wit and Verheye (2009) conducted a study on land use planning for the attainment of sustainability in development. The author utilised secondary data collection methods for exploring the research problem in light of previous studies. It has been highlighted in the research that conservation measures are significant to influence the sustainable use of land, as these are effective to avoid the unnecessary use of a property. The findings show the direct benefits of using these conservation measures, which indicates that scarce resources can be managed efficiently. The sustainability outcomes can create immediate benefits in different dimensions of environmental, economic and social factors. Davies et al. (2015) demonstrated the fact that some of the main drivers, which are creating the needs of application of sustainable practices are including technological, climatic, demographic, economic, cultural as well as policy and institutional factors. One of the vital issue, which is creating desertification in the society is wood extraction and other similar activities. The author demonstrated the fact that Sustainable land management in this regard plays an influential role in land restoration, which can be cost-effective as well. One of the practice is local governance, where local rules are developed. These are to eliminate tree cutting practices, water utilisation practices of individuals and other use of natural resources. In this manner, natural resources could be sustained efficiently, which can be ultimately used to meet the needs of future generations.

Moreover, the use of these practices can support individuals not to face severe issues in society. For instance, penalties are imposed on forest cutting activities and hunting of wildlife, which can

ultimately lead the residents to keep themselves away from these practices. One of the other events includes implanting forests and trees in the region, which can play a vital role to get new natural resources. This practice has the potential to get transformations in the environment, which can be seen in terms of an increase in rainfall and growth in water resources available. Moreover, these forests ultimately serve new housing options for wildlife, and they settle down in these areas, which increases the conservation of wildlife. Conservation of natural resources is significant to promote different business activities in the region. The availability of water and other resources encourage the companies to invest in these areas, and production houses can be built in these regions, which can include FMCG firms and other organisations. Sustainable land-use practices maximise Governmental and local accountability regarding the management of resources. Following are some benefits of sustainable land management.

2.2.1.1 Increased economic profitability in long-term

According to Gnacadja (2009), Sustainable land management (SLM) practices were observed in the study to reveal the benefits, which can be gained from these practices. The author produced a paper on the premise of previous as these studies include reliable facts and figures. The author highlighted the fact that SLM has the potential to increase the yields of different regions, which can amount up to 30-170%. The global yields have reduced up to 16% due to soil degradation, which can be entitled as an outcome of non-utilisation of SLM (Refer to figure provided below). SLM practices have the potential to benefit the consequences of the farming business. Small-Scale farming can gain numerous benefits due to these practices, as they are not needed to invest massive cost in this case. The production benefits can be higher, along with an increase in profitability. In another example, degradation can cause a loss of income, which can be seen in Rainfed areas, flooded areas and rangeland. These amounts to US\$ 8.2, 10.8 and 23.3 billion per year.

2.2.1.2 Less affluent can also support economic activity

De Wit and Verheye (2009) explored the fact that effective land management practices can be supportive for enhancing the economic standpoint of different countries and their Gross National Product (GNP) can also be transformed. The author highlighted that 44% of people throughout the globe are using agriculture as their sole employment option. This occupation has enabled them to be ever-changing. Agriculture is a multi-face activity that includes animal rearing for, directly supporting meat and milk production. The industry also comprises farming of different essential food items; food being a necessity, is every human being's requirement for sustenance. A country

may be technically strong because of its strong secondary industrial sector; such a state may also play a significant role in modernising the global economy.

Nevertheless, people cannot eat money or other capital goods they produce. Therefore, food is an essential item that is required regardless of the economic power of a country. However, the agricultural industry is susceptible to natural eco-system (freshwater reserves, forests, uncorrupted land). All these resources are either not renewable or require a lot of time to become useful and play their part in the economic health of this world.

In areas with adverse climatic conditions, effective urban planning can bring positive changes in land management. The reasoning is that urban planning encourages different business activities including general ones such as the development of supermarkets, retail stores and shopping malls. These can bring a change in trading activities of the region. With the maximisation of trading activities, the economic prosperity of the country transforms into a greater extent, which can play an influential role in transforming the living standard of the economy.

Schulte et al. (2014) have also supported the view of authors De Wit and Verheye (2009), the objective of the research was to create a link between sustained land use and feeding the growing population of this world through increased agricultural yield. By researching through several other authors work, the authors found that several factors could affect the farm yield. In particular, the damage to the eco-systems can harm even the technically advanced economy. The eco-system author found it was also damaged by incorrect usage of soil. For instance, economic activity in the heart of the rain forest can ultimately destroy the surrounding trees. Loss of trees shall effect cause pollution in the area, thereby affecting the timing of the rain. Lack of rain could eventually affect the livelihood of the poor agriculturists who shall also lose animal pests to economic activity, unsynchronised to the soil type.

Further, loss of trees shall also affect the yield power of the surrounding agricultural land that shall, in return, affect the farm produce. Reduced agricultural produce shall mean higher food prices, hence, ultimately influencing the output of the production workers. Therefore, the authors concluded that harmony between soil type and economic activity should help sustain the living of the masses of society. They were avoiding the lack of food for a rapidly growing population.

2.2.1.3 Increased agricultural activity for expanding the population and increasing poverty

For the agricultural sector to flourish, land management principles must be adopted. For this reason, the author's Sayer, et al. (2013) researched the similarities between land management

principles adopted in different countries. Different governments repeatedly take different policies to alleviate problems that plague land in different countries. However, by looking through published articles and journals, the authors established that consideration of socio-economic indicators. In addition to several demands of stakeholders, pressure from global organisations, the difference between primary and secondary activity economic figures and poverty and hunger reduction sway policy. These factors have been the base of all the faces of different land management practices adopted globally. The authors concluded that land management policy's enforcement helped farmers in retaining their small pieces of land. These pieces could be used to conduct primary based economic activity, thereby, not only helping to control poverty influenced by wealthy using his power to buy out poor.

On the other hand, curbing the abuse of power by the wealthy individuals of society can also help avoid feeding the technically advanced economic activity at the expense of agriculture. Albeit with lower yield due to lack of technology usage. Sayer et al. (2013) concluded that with the increased technically advanced economy, the country would play host to increased global population's concentration to it. However, technical advancement can help double the output of agricultural yield; nevertheless; these technological advances are not affordable to the masses. Therefore, the land management policy can help maintain a sustainable economic activity through opting the best mix between primary and secondary operation.

2.2.1.4 Avoidance of desertification

WHO. (2019) is a global organisation that is trying to educate on the subject of sustainable land management. It describes desertification as a conversion process where fertile land becomes a barren piece of the earth due to the unmatched economic activity being performed on it. Yes, economic activity is good for helping a country becoming a centre of global economic activity. Qatar is playing host to the 2022 world cup, and the match shall generate a flurry of economic activity, increasing the earnings. However, this increased activity needs sustenance in the form of basic food being caused by agricultural activity. This economic transition comes at the expense of a loss to a renewable resource, which is land. Industrial action dries up clean drinkable water reserves, the water that is replenished by an established eco-system in the area supported by trees. Industries need fuel sources, and these can be acquired by digging out the earth. This drilling shall cause loss to trees, influencing the natural rain system, thereby, quickening the process of deforestation, loss of cultivability of the land due to water. Simultaneously, the government does

not want to let go of the opportunities arising from the 2022 FIFA world cup. To capitalise on the occasion, it is developing a metro system; the system is supposed to help reduce the traffic flow by helping reduce the number of private cars on the roads. The project is a need for sustainable development of the economy because a reduced number of vehicles shall mean lessened pollution on the streets (Furlan, and AlMohannadi, 2016). Further, the system shall also help reduce the travelling stress on the workers thereby, increasing the economic activity through increased efficiency. Sustainable land management can help in avoiding this catastrophic situation arising in Qatar, which is already plagued by limited irrigational under-ground water reserves in the form of aquifers.

2.2.2 Land use practices and sustainable development - Issues

2.2.2.1 Issues caused due to building unplanned cities.

Eiraibe AL-Malki and Furlan (2016) have explored the problems caused by the lack of social interaction, open spaces in the area and haphazard zoning causing social issues. The issues may not be rectifiable in a short time and may consume a significant cost required to correct them. The authors researched in the Al-Sadd area in Doha by conducting questionnaire-based interviews. They found that land management affected the economic activity fuelled by car parking problems, smooth vehicular movement costing the economy socially, economically and ecologically. Yes, sustainable economy is fed by social and ecological factors; increased transit time can cause mental stress on the workers. Which, in return, shall affect their productivity, creating a controllable economic loss to the society.

As the findings of Bel-Air (2015) have shown the urban planning should be done efficiently to meet the ever-changing demands of society. In UAE, the increasing trends in a population are creating needs to adopt efficient construction plans, which can be significant to settle the whole community in a limited space available within the urban region. Pawe and Saikia (2018) highlighted another vital aspect and showed that unplanned metropolitan cities hurt the sustainability of natural resources. The reasoning is that these cannot be utilised efficiently to meet the needs of society within scarce resources. Moreover, poor waste management can be seen as one of the consequences of inefficient urban planning, along with different sanitary issues. Here, the problems arise as plans do not include different guidelines regarding the management of disposal from the start to the endpoint. Effective waste management and sanitary planning can be

seen as a framework, which shows possible points, where waste can be generated and shows different channels that how debris will be transmitted to the endpoint so that it could be recycled appropriately. One of the outcome, which can be seen from unplanned cities is that it can cause environmental issues, which can, in turn, generate several other severe problems in society. According to FAO (2008), unplanned cities can create infrastructural difficulties and management of population within limited areas available can be negatively affected. The reasoning is that population trends are showing a swift change in Qatar and showing an increasing trend with the evolution of time. This is creating a need for public sector construction companies to focus on the development of urban plans, where the massive population could be adjusted. Here, high rise building styled apartments can be more feasible to change more people in a limited area.

Simultaneously, increased transit time and lack of undeveloped transport system shall clog-up the traffic flow. This messy traffic had left a two-toned impact on the economy; firstly, air pollution is increasing, affecting the natural eco-system of Qatar. Damage to the eco-system shall affect the already limited drinkable water reserves in the form of aquifers. Aquifers are underground water reserves that are replenished through rainwater and rain is dependent on trees. Although, the water shortage problem may be overcome by using the desalination process, nevertheless, the seawater cannot sustain every economic activity. In particular, agricultural business, crops cannot be watered through treated seawater because of their nature. Secondly, increased transit time, between workplace and home. Each second lost is unproductive time. It is sterile, as it may have generated the economic value by using the resources to transport the workers.

Further, the workers are being paid to conduct an economic activity that is utilising natural resources that are not renewable. This means that the cost of doing a commercial business is remaining uncovered by the revenue generated by this activity; hence, this disparity between expenditure and income is not sustainable in the long term. Further, the unplanned zoning is also overlapping different sectors of the economy, thereby, funding the hate amongst the different classes of society. The authors concluded that planning could help avoid the economic losses caused due to ineffective land management.

2.2.2.2 *Issues of the mass transit system*

According to Furlan and AlMohannadi (2016), the mass transit system being developed in Qatar is part of effective land management. However, the system's cost shall be covered by the type of benefits it brings to society as a whole. Qatar is dependent on freshwater aquifer underground

reserves; they are limited and may be contaminated because of hazardous construction activity related to the vastly spread across the transit system. Therefore, the government has to take care while building the system, working round the clock with environmentalists. The land acquisition may be a problem too, mainly, if small farmer cultivating it for his economic sustenance owns that piece of land. Usage of the property shall not only cost that family an earning; on the other hand, it may also contribute to reduced primary economic activity, affecting the agricultural output. Another thing is the cropping up of supporting commercial activities might result in soil not matching with transit system related activity, thereby, causing desertification.

Furlan and AlMohannadi (2016) also explored the vastness of connections of such a system playing a vital role in making it useful for the users. The system shall be used by several passengers who at the same time, either want to reach an office in a specific part of the city. This office may be supporting Qatari economy through commercial and or industrial activity. Hence, zoning of the land shall play an equally important role in making this system useable by the masses. Further, the order shall also host foreign visitors to the country pouring in to view the 2022 world cup.

Figure 1: Effect of land management. (Source; Gnacadja, 2009).

Percentage of global population without secured access to fresh water	19%
Percentage of global population without secured access to energy supply	30%
Reduction of global yields due to soil degradation and water scarcity	16%
Potential yield increase through SLM practices	30-170%
Potential yield increase by means of carbon sequestration	10-150%
The greatest potential for yield increases is in agriculture systems with low yields of around	1t/ha
Estimated loss of income due to desertification and degradation (US\$ billion per year)	
- Rainfed areas	8.2
- Irrigated areas	10.8
- Rangeland	23.3

According to Kasim et al. (2015), developing for mapping degradation and conservation can be useful for the elimination of waste of resources. The author produced a study by conducting surveys using a semi-structured questionnaire, which is significant to gain evidence from Central Rift Valley in Ethiopia. The research is revealing the outcomes of land closure, which is vital for the rehabilitation and regeneration of degraded land. The area closure was done in this valley of Ethiopia so that re-growth of vegetation can be attained after several years of rest. Here, the closing was done after planting nitrogen-fixing/multi-purpose shrubs as well as trees. This was mainly done to omit low crop produces and eliminate inadequate production of livestock. The findings of the research contributed the fact that 65% of the respondents agreed with the fact that area closure has benefited them as chemical properties possessed by the soil have increased, which has enhanced agricultural production outcomes.

2.2.3 Trends in current land-use practices

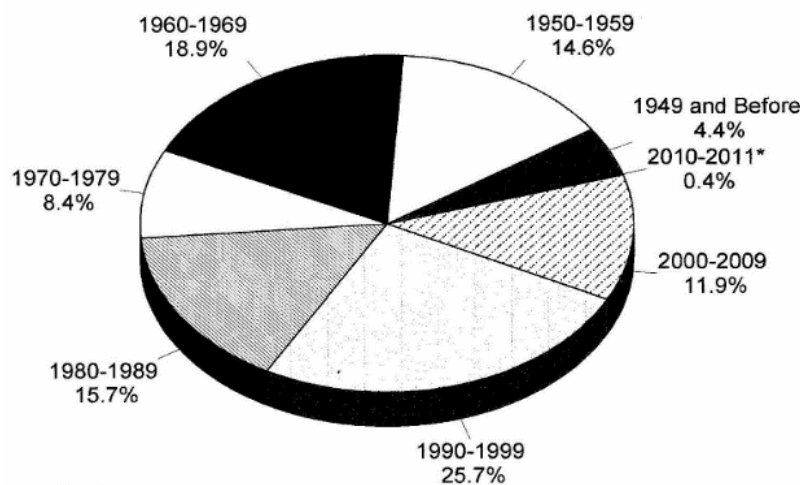
2.2.3.1 *Increasing population trends and land use*

Knickel (2012) produced a study on current trends in land use and the drivers, which are impacting land management. The current trend prevailing regarding land management are required to be changed as changes in global population in 2030 can amount to an increase of 36% in contrast with 2000. Whereas, cultivation area decreased up to 0.25 ha in comparison with the last 50 years. The sustainability practices in high-income countries are almost non-existent, which is causing a rapid decline in the total area available for cultivation. The author highlighted that currently, there is a strong need for effective land management practices, which can be employed to meet the needs of the increasing population throughout the globe. The need for effective land management can be seen from the study of De Wit and Verheye (2009), where the land/man ratio of the African continent is revealed. The author highlighted the observation made of Verheye in 1997, which is showing that rate in the year of 1965 was 0.62 ha, which decreased up to 0.26 ha in the year of 1995. This is due to the more significant increase in population, which has created increased the need for effective land management so that scarcity cannot be faced by future generations.

Land-use planning has changed with the changing period and increasing trends in population. Evidence can be observed from the findings of Karen (2013), which is showing a swift change in construction sector plans. The reasoning is that structural planning used previously in the 2000s was quite different now. The ranch homes built up are now revealing more significant changes as

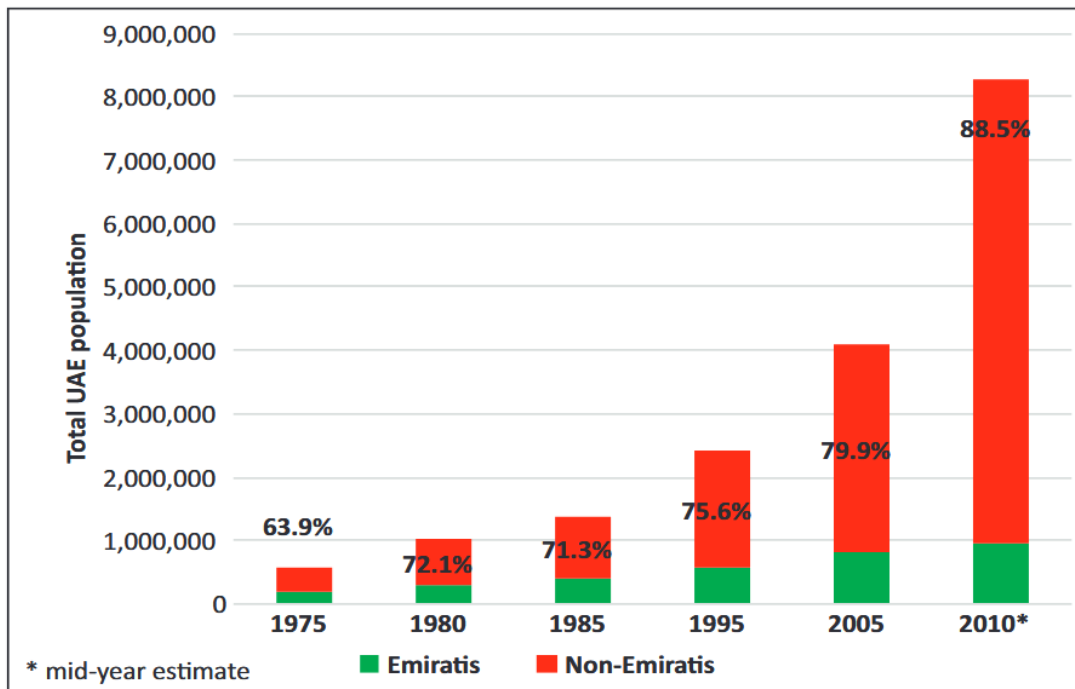
room sizes, and floor plans are changing now along with the number of bathrooms and elevation plans. The changes in the public sector of construction companies are the main reason for the increase in population. Karen (2013) demonstrated the fact that along with household size household type produced is also showing the swift change. The reasoning is that previously in 1990s single-storey houses were mainly included in construction plans of urban areas, However, with the changing period, the single-story homes are not developed any more in cities, which is mainly to adjust increasing population. This is one of the reasons that now urban planning has more emphasis on the development of high-rise apartment buildings, where more needs of more individuals can be adjusted with the use of a limited piece of land. One of the other reason is that these high-rise buildings in urban planning are playing a significant role to meet the needs of individuals more affordably as these take lower cost in contrast with the funds required to get single storey house. The percentage of single-family homes have contracted over the years, and this was quite lower from 2010 through 2011. This trend was higher from 1960 through 1969 as the proportion was 18.9%.

Percentage of Single-Family Homes Built by Decade



These changing plans are creating new options for public sector companies to reveal a swift change in their construction practices, which can also play a vital role to get higher profitability. According to Bel-Air (2015), the reasoning is that population trends in the UAE are changing rapidly, which is mainly due to the increased migration of non-Emiratis, who are settling in the UAE for their

jobs (Refer to below figure). The author highlighted that this new trend new opportunities in the construction sector, which is one of the main reason that non-emirate workers are more hired by these organisations. Inclusive of employment opportunities, mixed marriages are labelled as another reason behind increasing population trends. Thus, changing trends in the number of residents are growing opportunistic options for public sector companies.



Yilmaz, Çağdaş and Demir (2015) discussed the land-use practices in his research on sustainable agricultural programs. Sustainable agricultural development programs are concerned with the conservation of natural resources and involve the integrated analysis of these resources and their mechanisms of interdependence. The drainage network, geology, geomorphology and vegetation are natural resources that interact with each other and between the distributions of soil classes, considered the leading natural resource in the planning elaboration. The agricultural ecosystem, however, is quite heterogeneous, variable according to the characteristics of the physical and biotic environment that make up the terrestrial surface and their interrelations provide different backgrounds. The pattern of anthropic use, agricultural or not, is related to this distribution of environments. Thus, knowledge of natural resources allows us to evaluate land use capacity, which associated with socioeconomic conditions will form the basis of agronomic planning.

Bardos et al. (2016), observed in his research work that the main trends in land assessment followed in recent decades have been the shift from generalised estimates to more specific use assessments, increased use of soil-only factors and mainly the increase in attempts to quantify evaluation results. Indeed, the need for more detailed information on land suitability for specific applications seems to exist not only in developing countries but also in developed countries. A study conducted in the United Kingdom and cited by Rimal et al. (2015), whose aim was to compare British farmers' level of information on their land capacity with their suitability for specific uses, showed that in terms of more general assessment, producers were perfectly aware of the quality of their land. They were, however, much less informed about their real suitability for the specific purposes that were researched.

2.2.3.2 *Current trends in Land use for Agricultural Production*

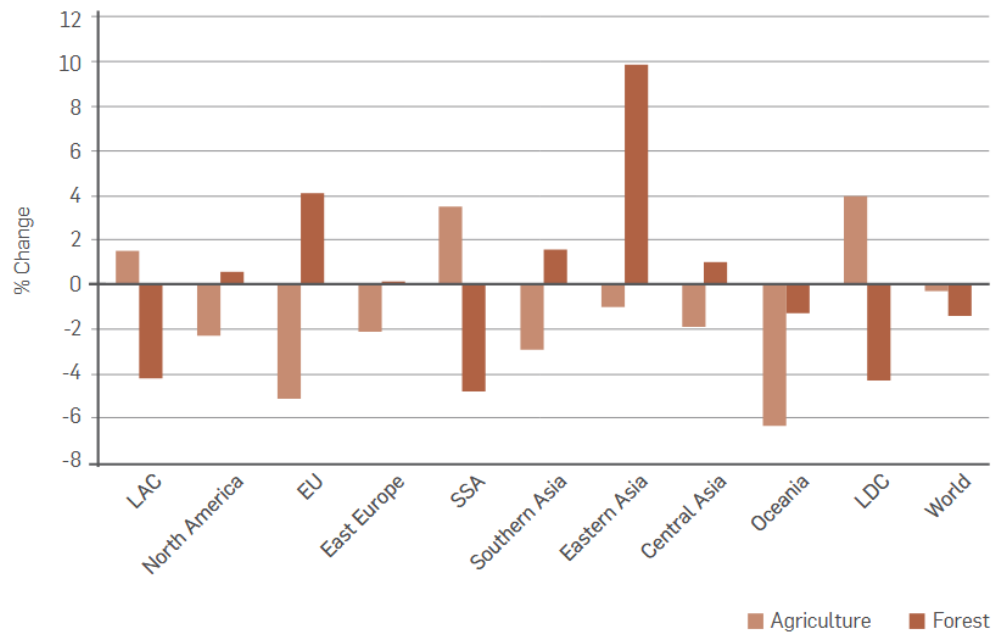
According to Hrelja (2015), the modern trend in the quantitative assessment of land production potential is the use of system analysis techniques and computer simulation models, which allow for the more dynamic combining of environmental data with their effects on crops. These models calculate yield in response to ecological growth control factors, based on knowledge of the fundamental relationships between crop performance, climate and soil water as they are handled by the producer. The assessment can then be done directly by applying a site-specific culture model, or otherwise using the results of the multi-crop models to develop agro-ecological zoning. Despite the advantages that quantified models and systems offer, it can be seen that most evaluations are still qualitative. This, according to Sallis et al. (2016), is explained by a large number of complex and interactive factors that determine the production potential and, consequently, the vast amount of data needed for a comprehensive and fully quantitative analysis. It is complicated to draw the line between qualitative assessment and quantitative assessment. Sallis et al. (2016), defined the quantitative evaluation method those that use numerical parameters for evaluation and produce numerical results. Anguelovski et al. (2016) do not agree with this definition. For the author, the statistical result is not enough, and the quantitative physical evaluation is related to the production results. The FAO system initially restricted quantitative character to the use of economic criteria in the assessment. Subsequently, this concept was revised and quantitative now refers to how to express the results of the evaluation. A two-stage process division was proposed, which is the method generally used by evaluators. In the second stage, a socioeconomic analysis is superimposed on the study of the physical production of the culture, to

decide if what is technically viable is also economically recommendable and socially acceptable. According to Baird et al. (2016), since the requirements of the numerous types of land use are so varied, quantification is expected to be introduced in various ways, and this should indeed be encouraged.

2.2.3.3 *Sustainable land used trends in the 21st century*

United Nations (2012) produced a study, which reveals sustainable land used trends in the 21st century. The author generated findings with the use of previous studies and case studies of land management in different countries are critically observed. The results show that forest density has increased in contrast with past decades throughout the globe, which can be seen as an outcome of higher sustainability measures utilised in North America and Europe (Refer to figure provided below). Biodiversity is one of the critical elements, which was ignored in previous decades, however, with the rise of 21st century this element was entirely highlighted in different studies and numerous steps are taken in various economies to conserve the biodiversity of different regions. The author emphasised that this is considered as a raw material for health nutrition. The past trends regarding the management of this factor have created a negative impact and created an abundance of diversity in species. Nasi, Taber and Vliet (2011) showed that wild flora and fauna offers nutrition to almost 80% of the population prevailing in developing countries of the world. The author highlighted that if these current trends continue, different species will be extinct. For the preservation of these species, different practices are used, and regulations are put forward to eliminate the depletion of resources.

Figure 2: Sustainability measures. (Source; United Nations, 2012).



2.2.4 Trends in current land-use practices in the Middle East public sector

Woertz (2017) elaborated the fact that land reforms enacted the 1950s and 1960s. These have caused liberalisation in bureaucratic-authoritarian changes, which has influenced different regions of the Middle East as well as public and private sector firms operating in these regions. The land reforms have transformed the position of different countries, and the greater influence of these can be seen in Saudi Arabia. This has enabled different countries, most specifically Saudi Arabia, to gain self-sufficiency in agriculture to wake up higher trends in development. The outcome can be seen in terms of an increase in % of GDP contribution provided by agriculture. The gift of Saudi Arabia was higher in contrast with other Middle East countries, and this was amounting to 20.2 % in the year of 2012. The conclusion produced is showing that more policies should be introduced, which can play a contributing role in sustainable land management. According to Cramer (2018), those policies should be developed, which can play a contributing role in the sustainable development of the country, where individuals can utilise it as a source of income.

The research study conducted by Reitsma et al. (2015), mentioned that an increase in world agricultural production to meet the needs of an expanding population. However, in a large number of underdeveloped countries, food production is already insufficient to meet current consumption

needs, and this situation is expected to continue for many years to come. In the opposite reality, in developed countries, the need for food is no longer a problem. Still, the surpluses that result in stockpiling and the growing environmental issues associated with commonly used intensive production systems have become critical issues in formulating food.

The study produced by Madbouly (2009), is showing urban planning within the context of Middle East countries. The author highlighted that land management strategy was introduced in different Middle East countries during the last 20 years. The procedure was utilised as an option of the new housing strategy, which is supportive urban planning and development. Another essential purpose was to gain informal settlement so that upgrading of land can be done. Further, these are used to introduce a regularisation program, which has provided guiding principles in redeveloping of old areas. The author highlighted that political intervention and central policies could support land management. The outcomes of these land management strategies can be seen in terms of socio-economic development of the region. It has been assessed in the study that the inefficient public sector can create adverse outcomes of investment done in land management.

2.2.5 The challenges, constraints, and impact in the current land-use

Deininger, Hilhorst and Songwe (2014) explored different constraints, which can affect land management. These have the potential to influence sustainable land use within the Middle East, and for the evaluation of research problem case study methodology is mainly utilised. Intra-household bargaining power is considered as one of the constraints, which can negatively affect the consequences of land management. The reasoning is that urban planning is done in an economical manner, which can be less costly for the population. Here, the cost of land management is critically focused, and sustainability can be disregarded due to this constraint. The outcome can be seen in terms of inefficient municipality system. Madbouly (2009) explored the fact that urban planning is an essential aspect of land management. In this regard, strategies used for municipality management plays an influential role to preserve sustainability across the regions. It can be demonstrated that public-private partnership (PPP) arrangements in a municipality can be significant in this regard.

De Wit and Verheye (2009) highlighted that issues could arise in sustainable land development, which can hinder effective management. For instance, Africa has made tremendous efforts to gain land development sustainably so that globalisation opportunities can be achieved. However,

political instability has negatively influenced the development goals. Deininger, Hilhorst and Songwe (2014) availability of resources and investment is another factor, which can degrade land-use practices. This constraint has created challenges in cultivation and agricultural yields within the Middle East. The reasoning is that the total area available for agriculture is 65,869; however, the entire area cultivated in the region is 2,756 showing a yield gap of 0.604. One of the challenge and constraint in the public sector is that urban planning is not in place, and improper plans are developed by the companies involved in construction. Each company uses its practices and strategies, which negatively affects urban planning, and this is lacking quality in infrastructure.

The challenges are faced due to the economic prevailing in the country, which are not supportive and creating numerous difficulties. The availability of funds is quite lower in contrast with the needs to develop advanced infrastructure (Nair, 2014). Here, the public sector organisations are provided with limited funds, and they face issues to manage urban planning within these funds. Therefore, it can be demonstrated that challenges faced by the public sector are creating a negative impact on land use practices as these are hindering the effective utilisation of land. Inclusive of economic challenges, numerous environmental problems are also creating a negative influence on the usage of land (Nair, 2014). This can be supported back from the fact that land deterioration, salinity and other issues are leading the organisations to omit their use. The reasoning is that the development of housing plans in areas of salinity and waterlogging can cause damage to the developed houses and settling residence in these areas is impossible (). Another significant changing trends in the environment is the loss of natural resources, which can hinder the use of land. For instance, water availability in different areas increase the settlement of rural population and people and settle down in these areas to work. The main reason to seek compensation in these areas is to engage themselves in agricultural activities with the most comfortable utilisation of water from natural resources such as river streams, canals and other resources as well as to get the settlement in the area providing a free of cost supply of water. However, the changing environmental condition is omitting or reducing the availability of these resources, which can lead the population to switch towards other areas. This can be evidenced as one of the changes in land-use practices (Pretty, 2007).

Another critical challenge, which is affecting the utilisation of land is technological factors (Pretty, 2007). Modern farmers observe the technologies available to them to preview whether these can be supportive in crop production or not (Pretty, 2007). Overviewing the availability of

technologies, land-use practices can change over time. The reason is that unavailability of funds are faced as one of the constraints by farmers, which leads them to leave their agricultural land vacant, and they do not invest in it to get production output. Additionally, legal factors are also influential in posing challenges for land use due to the needs of different ownerships rights and other legal issues. In this instance, many regions with the advanced legal system are offering land on a lease so that farmers can investing it and get output production, which can maximise their earnings as well as profitability in agriculture. With the rise in income distribution trends, the social factors are changing, and productive individuals in society want to get more place in contrast with their family needs. The reasoning is that they do not find any attraction in the high-rise building system, which is the main reason that they want single-storey houses. This creates issues in accommodation of population within the limited area. These social trends are revealing a significant change in land-use practices, where middle-class individuals are showing higher preference to get living in apartments. The decline in agricultural output can be seen as one of the outcomes, and this can hurt the economic development and growth of the region. The reasoning is that output decrease can cause in decline in GDP or national income contributed by this sector, which can ultimately influence the economic development(Nair, 2014).

2.2.6 Current Issues - Land use practices in the Qatari public sector

Sillitoe, Alshawhi and Hassan (2010) researched different challenges faced within the conservation of land in Qatar. Research is produced using quantitative and qualitative data collection, where information is accessed using the Ecology survey report as well as informal interviews. The discussion reveals that political prospect on the region is higher, which has influenced land management. The reasoning is that the majority of the land is owned by the government and access as well as use of land is quite challengeable. These practices are used due to the increased proportion of migrant labour so that property ownership rights of migrants can be limited. These bureaucratic policies are introduced to preserve natural resources and omit depletion. Shandas, Makido and Ferwati (2017) demonstrated the fact that tracing land cover change can be vital for a sustainable future as these observations can enable the development of new landscape transformation strategies. The infrastructure development of the city can be enhanced with the use of these transformation strategies. The author demonstrated that environmental degradation could be transformed effectively by critically observing the approach used by Japan after the incident of

Hiroshima and Nagasaki. The after-effects of events have caused higher ecological degradation, which was the main reason that different sustainability strategies were adopted to bring positive change.

The aftermaths of Hiroshima and Nagasaki incidents were managed by Japan with the use of different sustainability practices to reconcile from the adverse situation prevailing (Ozasa, Grant and Kodama, 2018). Conservation measures were used by Japan to keep natural resources and get new ones by investing in greener investment options, which can exert positive footprints on the environment. These practices have played a supportive role in transforming environmental situations and getting changes inland use. The fertility of the land has changed to some level with the use of area closure strategies; however, still, the use of sustainability practices are required to meet the ever-changing needs of the society. According to FAO (2008), Qatar is a small peninsula covering almost 11 000 km² of land; however, showing a rapid increase in population and number of individuals per household is increasing rapidly. With these changing trends, land management issues have occurred a significant change. However, still, the suitability index for agriculture is higher, which reveals greater feasibility for agriculture and soil is highly supportive in this regard.

Nevertheless, unavailability of sources for irrigation can cause challenges for farmers, and the management of crops can be negatively affected. The natural sources of flooding are almost unavailable, which can cause a negative influence on agriculture, and more cost is required to be invested in this case. For instance, drip irrigation and other technologies are used in agriculture, which ultimately increases the overall value of crop produces. This is one of the challenges in effective land-use practices as higher cost of agriculture is one of the factors, which leads to a contraction in the use of land. This means that property remains vacant and crops are not implanted, and the firms have to forego their possible profits, which could otherwise be gained from investing in this area. This aspect has the potential to influence economic development and GDP growth of the country. The farmers can also face issues in this case as they have to adopt other practices for the attainment of income, or they have to rely on other income sources.

Kerr et al. (2016), discussed the application of the rating system for land optimisation. The land use rating system was initially developed to guide US farmers in planning for the sustainable use of their properties. For this purpose, the system proved to be appropriate. The capacity map shows the farmer which farmland can be used for each object and which soil conservation practices

should be employed. It is relatively easy to present and is relatively simple to adapt to different physical environments and technology levels. The main disadvantage of the system, however, is that it is essentially a land grading for use with arable crops, providing a simple scale from best to worst. Other constraints to the system highlighted by Neher (2018), are the lack of information on suitability for specific crops with distinct agro-ecological needs, an overestimation of land use capacity with numerous minor limitations, and the unsatisfactory form of climate limitations are addressed by the system. The system is based on the negative factors of the land, i.e. the constraints and socioeconomic factors are taken into consideration only as a reference.

Parallel to the usability system and its various modifications and adaptations, other proposals were discussed by Rimal et al. (2015), in association with geography and geomorphology, using landscape units that are identified through the interpretation of aerial photographs. It is assumed that visible differences in these units reflect differences in natural resources, which can be translated in terms of land use potential and required management practices. An example of these systems is the *Land System Survey* developed by the *Commonwealth Scientific and Industrial Research Organisation* (CSIRO) in Australia. This medium formed the basis for a type of assessment known as integrated survey Sallis et al. (2016), which influenced the development of assessments that use the concept of land as the basic spatial unit rather than the more restricted idea of soil.

Yilmaz, Çağdaş and Demir (2015), also similarly devised a land assessment system for the Public sector in agricultural lands. A land-use capacity classification system for soil recognition surveys. This system used four classes defined for long cycle crops and short cycle crops under different management levels. This classification was later modified by Anguelovski

et al. (2016), for the system currently in use to include among other modifications other types of use such as natural and artificial pastures, reforestation and forests and preservation of flora and fauna. The authors attempted to include in the methodology not only the concepts of the US usability system but also thoughts expressed by other sources. As in the American order, a hierarchical sequence of uses is assumed in the Brazilian system of agricultural aptitude, which is implicit in the categorical structure of the system itself. That is, in a descending sequence of aspiration, the best land is allocated for annual crops and land unsuitable for this purpose is classified for other less intensive uses. The justification for this sequence is the greater importance

of this first group in terms of food production and the assumption that these crops are more demanding in terms of requirements. Similarly, if the land is suitable for short-cycle plants, it will also be ideal for long-cycle crops and other less intensive uses. This procedure could be questioned because the requirements of different cultures do not obey this type of division. Another point is that only lands considered unfit for other uses and which are in the lower hierarchical classes are considered for environmental preservation. This association of marginality and ecological conservation can no longer be accepted.

Kerr et al. (2016), also presented research work on the similar research area of Brazilian system for land optimisation and considered it a definite system along with introducing some concepts of the Food and Agriculture Organisation (FAO) system. It does not work, for example, with isolated soil attributes such as texture, permeability, etc., but interprets these attributes in terms of environmental qualities such as water availability, nutrients, etc. Another advantage introduced is the consideration of three levels of management, essential for a better representation of our reality. According to Kerr et al. (2016), however, the main factors that have hindered the diffusion of the methodology are the difficulty of its understanding by non-specialists in the area and the non-application of the system to specific cultures or uses. The author suggests as main measures for the improvement and popularisation of the use of this system its adaptation for use for the main crops of the country and the better quantification of the environmental qualities used in the evaluation.

According to Hrelja (2015), interdisciplinary land use research is a relatively new field, although aspects of land use, particularly agriculture, forestry and ecology, have been studied for many decades. Further studies have emerged, enabling the integration of results from various disciplines for a better understanding of what land use is, what determines land use, and what future consequences land-use change may cause. Since 1980, there have been substantial changes in the methodology and types of land resource issues posed by planners and managers. Technological change is reflected in the increasing use of modelling techniques integrated with geographic information systems, which offer promising possibilities in natural resource assessments. Much emphasis has been placed on simulating crop growth through the use of models. It should not be forgotten, however, that the use of modelling in land assessment depends on the availability of data on natural resources. This is countered by the problem, as highlighted by Rimal et al. (2015),

that government financial resources allocated for land or environmental surveys are generally insufficient or have been reduced. In the future, the significant research challenges in the field of land assessment are the validation of models and their interconnection with geographic information systems and the development of integrated and multidisciplinary land use studies. It is hoped that through these scientific advances, land assessment can play a crucial role in adopting a more sensitive stance in the use of natural resources and environmental preservation. However, regardless of the methodologies to be approved for the resolution of ecological problems arising from land use, planning that integrates all phases of the process solidly, is essential.

Reitsma et al. (2015) argued similarly that the emergence of different proposals and methods for land assessment has often resulted in difficulties in exchanging information. To meet the need for standardisation of methodology and terminology, the FAO in 1976 produced its Land Evaluation System which established a set of fundamental principles and concepts on which procedures for assessing the potential of land can be built. Thus, it does not constitute an evaluation system per se, but a methodology or work philosophy, which serves as the basis for the development of local, regional or national evaluation systems, whose purpose is to support the planning of agricultural land use. For the development of these concepts, FAO combined the experience of American soil survey and land classification interpretation systems with the knowledge of mixed reviews Kerr et al. (2016). However, due to the long association of the term capacity with the concepts of the American system and its various interpretations, it was decided to adopt a new term, suitability, to express a new idea. While land-use capacity assessment typically refers to widespread agricultural uses and not specific crops or practices, fitness within the FAO system refers to evaluation concerning a clearly defined land use activity or relatively uniform type.

As presented by Neher (2018), the procedures to be followed in an FAO-type assessment depend on the purpose, the level of detail of the study and the degree of integration of financial information. The essence of the process, however, is to compare the qualities of each land unit with the requirements of each type of use. It begins with the identification of the relevant usage types. Based on these types, the conditions are established, characterising what the land ideally should "offer". The next step is the description of the land units, with the determination of the relevant qualities, providing information about what the land really "offers". The process of combining or comparison is a process of synthesis where the conditions of the land area compared

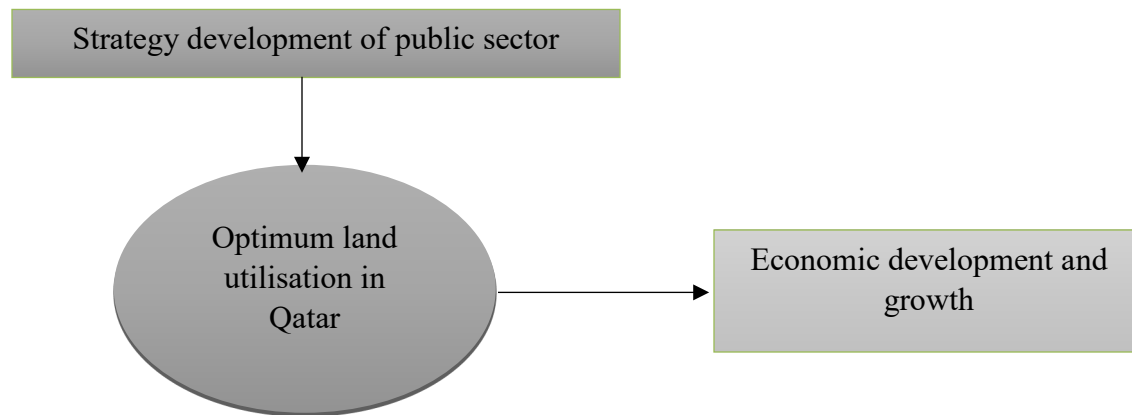
to the requirements of the types of use to obtain the suitability of each unit of land for each kind of use considered. It is noteworthy that there is a cyclical character in this precedent, which allows the refinement of the types of use, requirements of these uses and qualities of land units, with the consequent revision of the evaluation results until the objectives are reached. The process is usually divided into two stages, first establishing the biophysical aptitude, over which the socioeconomic assessment is superimposed. The evaluation is completed by checking the estimated skills in the field. The final ability is expressed in two orders, fit and not fit, which in turn are subdivided.

Al-Nabit (2018) explored the fact that Qatar land management goals are developed in the year of 2018. These goals are contributing to the attainment of sustainability in the country, which can ultimately maximise socio-economic development in the region. The strategies are designed to eliminate land degradation so that further biodiversity loss can be limited. Different projects and programs were introduced, which can be effective rehabilitate land in this region. The plans have the potential to omit environmental issues to eliminate emissions. One of the practices used is planation of mangroves so that green spaces can be increased. The Environmental Performance Index Qatar is 32 out of 180 member states, which can be changed using these strategies. Shandas, Makido and Ferwati (2017) demonstrated the fact that rapid urban growth in Qatar has created numerous opportunities regarding land management. The increasing population trend is the main reason, which has created a need for the expansion of urban infrastructure.

2.3 Literature Gap

The literature gap is prevailing in previous studies as previous studies are not showing the strategic framework, which can play a significant role in the optimum land utilisation within Qatar. The studies produced by previous researchers is only conducted on the challenges faced by Qatar in land management. One of the studies was presented by Al-Nabit (2018), which is revealing different national policies and programs utilised for sustainable development of Qatar. The discussion is including practise and strategies of Land management. However, it is not showing a strategic framework, which can cover all the areas of land-use practices. Another research was produced by Sillitoe, Alshawi and Hassan (2010), where different challenges were observed, which are hindering conservation in West Qatar. Therefore, the studies provided previously are not highlighting the strategic framework, which can be omitted with the use of this study.

2.4 Conceptual Framework



The conceptual framework is provided above, which is revealing research direction. Here, the development of a strategic framework in the Public sector has the potential to influence optimum land utilisation in Qatar, which can be sufficient to gain economic development and growth.

2.4.1 Possible research Outcomes

The conceptual framework shown in the above figure is highlighting the research design, which can be explored with the use of different research methods. Moreover, the hypothesis can also be verified with the utilisation of it. The possible research outcomes can be seen in terms of the identification of different challenges, which can affect the optimum use of land. Some of these challenges can include political, legal, technological, social, economic and environmental factors. These factors have the potential to limit or expand the utilisation of land. The challenges have the potential to affect local farmers, agricultural and construction firms. They reveal a swift change in land utilisation with the changes in these factors. The possible outcome regarding the impact of these factors can be seen in this research as a negative influence as the change in these can cause a decline in the decision making of individuals. Therefore, the study is significant to identify practices, which should be used in the attainment of economic development and growth in the UAE. Here, the sustainability practices could be seen as one of the possible outcomes of the research, which will show how the use of these practices can enable the efficient utilisation of resources to manage scarcity issues in future. Overviewing the outcomes of this public research sector can develop different strategies to eliminate different challenges arising in the environment.

2.5 Hypothesis

The hypothesis provided in this section could be verified to show falsification or acceptance of hypothesis. With the evaluation of these, the research problem can be explored critically. With the exploration of these results, the public sector can develop new strategies, which can transform the economic development and infrastructural growth of the country along with the optimum management of scarce resources.

H_0 : Null Hypothesis: Strategy development of the public sector is essential for optimum land utilisation in Qatar for economic development and growth

H_1 : Alternative Hypothesis: Strategy Development of the public sector is not essential for optimum land utilisation in Qatar for economic development and growth

2.6 Conclusion

The findings provided in previous studies are showing that land management is a challengeable task. Numerous studies have demonstrated different constraints, which can include Intra-household bargaining power, political instability, legal factors and other factors. However, effective land-use practices should be encouraged to get improvements in environmental factors so that degradation, as well as depletion of scarce resources, can be managed efficiently. Within the selected case of Qatar, it has been assessed that bureaucratic policies are used to place restrictions on the land access and use so that human habitats cannot introduce negative influence on it. The chapter shows the literature gap and to address this gap conceptual framework developed is showing research direction. The verification of hypothesis designed in this chapter can enable problem evaluation in this research.

Chapter 3: Research Context and Land Use in the Public Sector.

The sector and firms targeted in this research are discussed, where the potential influence of research outcomes on the public sector are elaborated. The expected changes in the industry are developed. The impact of research findings on the selected region is discussed to show the changes, which can be attained. The need and importance of efficient land management in the chosen area are revealed. The environmental changes can be in terms of land management.

3.1 Research Context and Scope within Qatar

As per the awareness fortified in the study of Savin-Baden and Major (2013), research context provides a view of the research scope, which can be broad or specific. The range of this research is accurate, and it cannot be generally applied to all the sectors and in all the regions of the world. Here, the area selected is Qatar and the associated targeted firms from this sector. The context is derived from the conceptual framework of the research, which can enable the evaluation of different concepts linked to the assessment of the research topic. One of the most important themes is related to the land management of the Qatari Public sector for urbanisation and industrialisation.

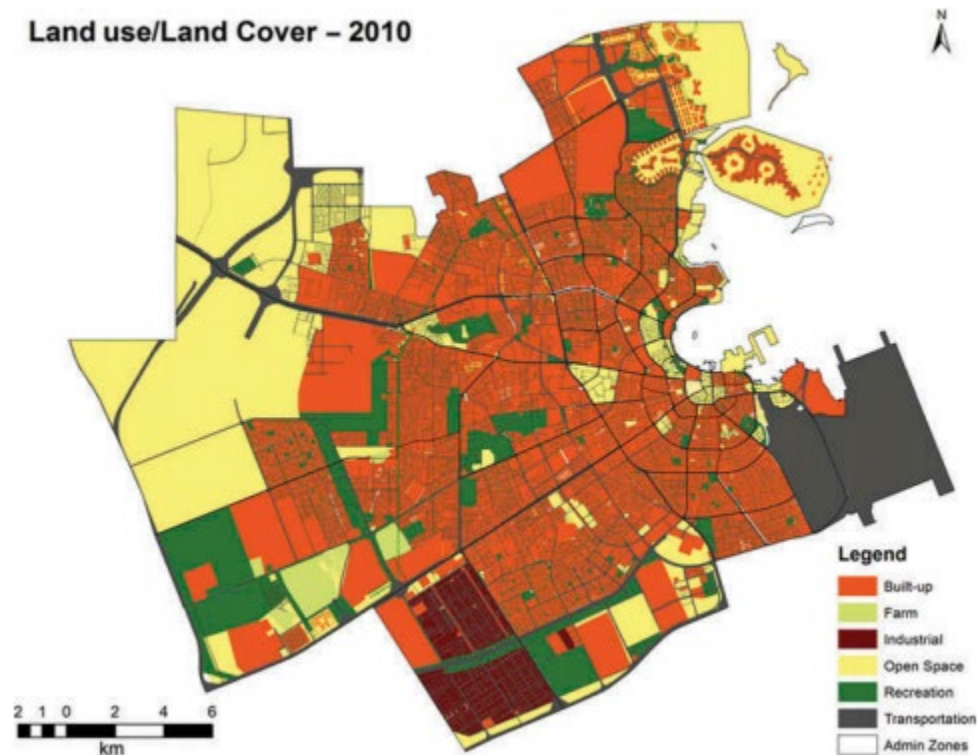


Figure 3 Land Use in Qatar (Source: Hashem, and Balakrishnan, 2015)

The evaluation is also performed in the study of Shandas, Makido and Ferwati (2017), where the authors have highlighted the concept that Qatar is showing tremendous urban growth, which is also affecting land use patterns in the region. The findings show that urban planners in Qatar have to focus on the maximisation of sustainable growth. The results are explicitly produced within the area of Doha in Qatar. This shows a limited research scope and findings that not wide specified within the context of Qatar. The discussion done in the research indicates that Doha has kept its entire focus on the development patterns, which are quite similar to Western cities. The findings suggest that development should be done by physical infrastructural planners overlooking the fact

that urban forms can cater to sustainability needs. Similar patterns of infrastructural development should be used, which were incorporated in the municipal formation with the U.S. and other European cities. This has also affected the urban development of Qatar as Doha is the capital city, and its infrastructural development is creating competitiveness of this region.

The infrastructural development is essential to meet the needs of different mega-projects in the past as well as in future. One of the significant future events is 2022 Football world cup, which is creating a need for the physical transformation of Doha. On the other hand, research produced by Al-Thani et al. (2019), revealed the fact that Qatar has envisioned to become a sustainable region for the attainment of Qatar National Vision (QNV) 2030.

The vision of 2030 is focused on increasing sustainability in land management for urban settlement and liveability. Moreover, the focus of this vision is to adjust the increasing population efficiently so that it cannot create liveability or settlement issues. The National Development Strategy is to act responsibly for the management of resources to sort out the scarcity of resources in future. However, the study only shows an explicit focus on Doha and its urban planning, and this literature gap needs to be transformed.

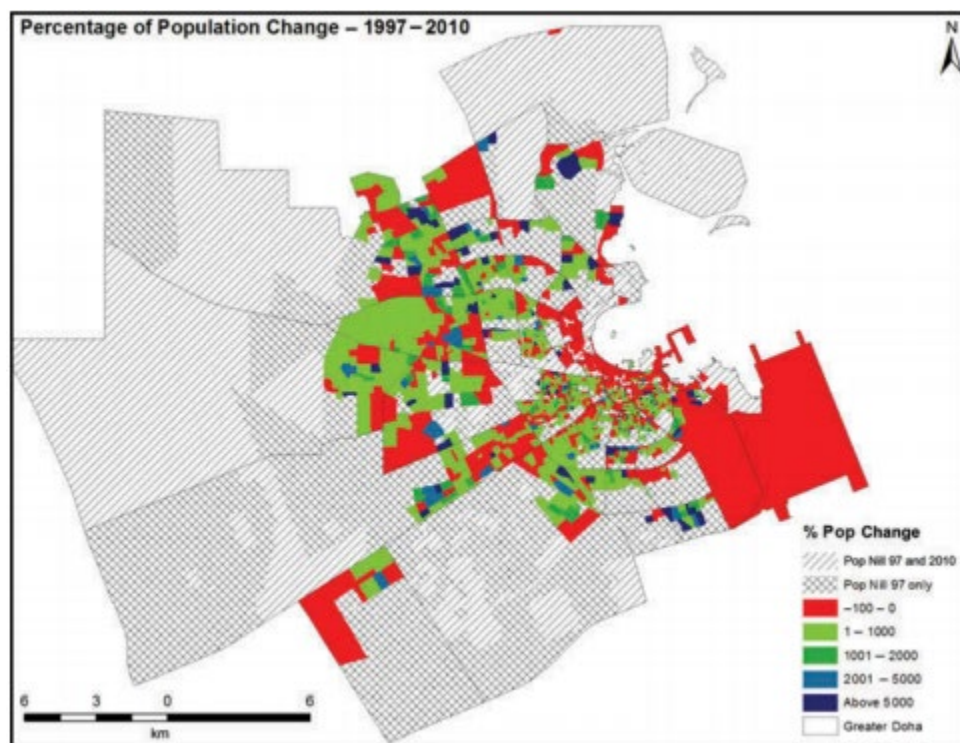


Figure 4 Population Density (Source: Hashem, and Balakrishnan, 2015)

3.2 Research Context and Scope within the Public sector

The sector targeted in this research is the public sector and strategies offered in this research could be used by the organisations of this sector. This transformation in the industry has the potential to bring changes in their practices, which can enable them to meet the sustainability goals of Qatar required in Qatar National Vision (QNV) 2030. The changes in strategies of these organisations can enable them to meet or exceed sustainability goals set for 2030 vision (Al-Suwaidi, 2018). These strategies could contribute to a more significant role in optimum land utilisation, which means that land can be managed sustainability. This is important to eliminate any chances of resource scarcity in future. The organisations can develop new construction and housing plans by overviewing increasing trends in population. The organisations can work for the maximisation of their production outcomes so that the economic growth of the region can also be enhanced (Shandas, Makido and Ferwati, 2017).

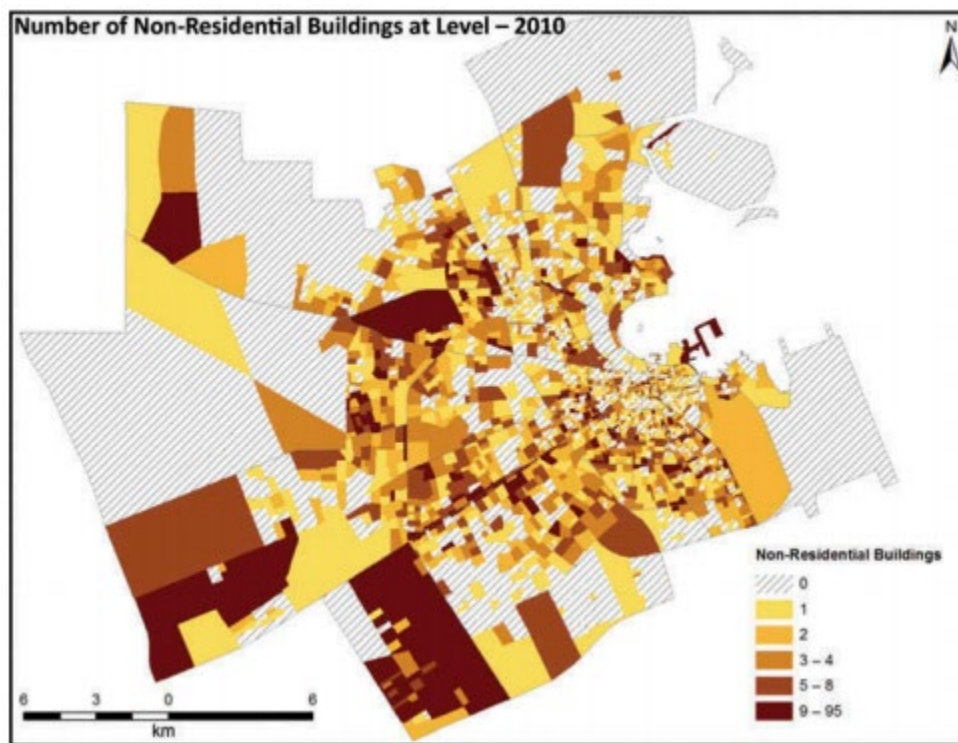


Figure 5 Non-Residential Building (Source: Hashem, and Balakrishnan, 2015)

Another potential factor of influence of this research is external factors. The factors discussed in this research could be used by organisations of this sector to develop new plans for the maximisation of their output. These factors can also be designed to explore different threats, which has the potential to affect the attainment of new opportunities from the market. The plans can be

devised to enable the elimination of these threats. Sridhar et al. (2016) identified social, technological, legal and environmental, which has the potential to create challengeable situations for firms. It has been assessed that these factors can affect public sector firms operations, and they can face challengeable situations in the attainment of growth. The evidence can be seen from the conceptual framework developed in the literature review, which is showing the influence of these external factors on the current land-use practices (Shandas, Makido and Ferwati, 2017). Therefore, it can be concluded that these factors have the potential to exert changes in land-use practices of Qatar. Moreover, the land optimisation variables are focused intensively in the research, where different factors, which can affect land-use optimisation, are elaborated.

One of the essential element in this regarding is conservation measures, and the findings regarding this aspect can support public sector firms to come up with new conservation strategies, which can maximise sustainability. The public sector also attains a new understanding regarding sustainability and different approach, which can enable them to keep intact with sustainable development in the industry (Shandas, Makido and Ferwati, 2017). The project has quite a broad scope, and not only construction firms can be benefited from the outcomes, yet other public sector firms in different industries can also be benefited. These industries can be of waste management, agriculture firms, cement industry, real estate and others can be helped. New strategies could be developed by them after overviewing the importance of sustainability, which can enable them to transform their current position in the industry. This can be justified from the fact explored in the study of Singh et al. (2012), which showed the importance of sustainability in the maximisation of a competitive edge. In other words, the research can offer new paradigms of future opportunities for public sector firms. Shandas, Makido and Ferwati (2017) highlighted the fact that firms investing in infrastructural development of Qatar are attainment new megaprojects, which are influencing their organisational scope positively.

Along with this, the improvements can be seen in terms of organisational growth, and firms can increase their attractiveness level in the industry. The outcomes of these can be seen in terms of increased market share and best in class position. The changes can be evidenced by the implementation of strategies in the public sector, and these can be in terms of higher GDP contribution of the industry, which can increase GDP as well as economic growth of Qatar.

The evaluation can be significant to recommend new strategies, which can be supportive of the attainment of Vision 2030 (Shandas, Makido and Ferwati, 2017). The opinions of these can enable

the inclusion of various quantitative and qualitative facts, which can transcribe the current strategies, practices or techniques used in land optimisation. The evaluation of current trends and gaps identified could be used to recommend new approaches, which can enable the elimination of the current research problem. Additionally, through the help of interviews, the experts accessed for data collection can reveal their opinions regarding the current strategies used in their organisations and how these strategies should be changed to get the accomplishment of Vision 2030 (Al-Thani et al., 2019). Here, observations can be gained regarding the implications of different land-use strategies. These observations can show a positive or negative influence on the attainment of sustainability. This means that findings can be used to highlight the best land use practice affecting environmental sustainability and to show those practices, which can hurt the durability of the region. Overlooking the consequences of these practices, the operations and strategies of organisations can be changed to reveal the most suitable ones (Frigo and Anderson, 2009).

Here, exclusion criteria are set up for private sector organisations as they are not explicitly targeted in this research. The reasoning is that none of the studies is previously conducted on the public sector organisations of Qatar. This means that change management can be contributed to the development of efficient land management practices. In this way, the firms within different functional levels can work for useful land management techniques. For instance, the public construction sector can come up with new strategies for urban planning, where plans can be used to offer accommodation for the higher population while utilising a small piece of land efficiently. Moreover, the essential aspects needed to be considered in urban planning and land management can be easily understood by these organisations with the use of this research. Some of these can be related to waste disposal, transit system, road mapping and other land management aspects. The Qatari public sector using the outcomes of this research can contribute to the national economic development of Qatar, and Qatar National Vision (QNV) of 2030 could be attained successfully. Furthermore, the evaluation can be gained regarding the initiation of institutional land reforms in public sector institutions and how these can enable new improvements in the investment of land (Frigo and Anderson, 2009). On the other hand, the importance of land development initiatives within the case of public sector institutions can be explored. This can also play an influential role in providing economic growth foundation within Qatar. Moreover, the importance of property rights among Qatari households can be evaluated, which can reveal outcomes regarding optimum

land use. Using a different type of qualitative and quantitative evaluation, a new strategic framework could be designed, which can be vital for optimum utilisation or land management.

3.3 The Qatari Public sector

The Qatari public sector is including organisations, which are owned by the public. These organisations are working for the attainment of sustainable growth, which is an important strategic target of every organisation. These organisations are developing unique strategies, which are significant to achieve Vision 2030. The significance of Qatari Public sector is that it has the potential to affect the economic growth of the country and GDP can be changed. Another critical factor is that performance of this sector and strategies have the potential to transform the accomplishment of Vision 2030. The operations of these organisations have the potential to affect the environment. The Qatari public sector is including different organisations, whose performance and planning outcomes can affect infrastructural development of the country.

According to MOTC (2014), ICT trends are emerging in the public sector of Qatar, which has the potential to enhance engagement among all the stakeholders of the firm. The Qatari public sector is increasing the utilisation of Information, and Communications Technology and the firms are getting benefits from its usage as new opportunities can be obtained using it. On the other hand, the challenges affecting the accomplishment of these opportunities can be achieved easily utilising ICT. Another significant trend in the public sector of Qatar is that organisations are becoming more intact with sustainable strategies. The general area of Qatar is expected to rise in the upcoming years as important events have the potential to increase growth intensity. The author predicted that higher growth could be evidenced by the case of Qatar, which can also influence the GDP growth of the economy. The increase is expected up to 3.4% by 2021, which can be the main result of changes in outcomes created by the public sector (World Bank, 2019).

3.4 Challenges and constraints need to be addressed

Kumar (2019) showed that higher legacy is faced by the public sector of Qatar, which is one of the significant threat and create barriers in the accomplishment of business strategies. Another critical challenge is that the organisations in this sector are facing issues in the implementation of cloud-based delivery models. This is mainly done to reduce exposure to security risks. Other challenges faced by this sector can include political, legal, economic, technological and environmental threats. The key decision-makers or players in this sector can include executive-

level staff who are involved in the development of different strategies, which are achieved to get unique performance attributes. They make decisions regarding the practices they should use, and their target for the accomplishment of sustainable growth is vital to achieving Vision 2030. These aspects can sustainably constrain effective land management and addressing these issues are essential to make improvements in sustainability.

The strategies could be recommended as outcomes of this research, which can ultimately maximise the effectiveness in land management of this region. As per Shandas, Makido and Ferwati (2017) Qatari population is showing a tremendous increase, which was mainly because of increasing expatriates in the area. These expatriates are reaching Qatar to get new employment opportunities and get a settlement in the region. The reasoning is that Qatar has become one of the top destinations for ex-pats. As per Bel-Air (2017), almost 89% of expatriates are a part of Qatar in 2017. The proportional rise is expected shortly as a new law introduced in the region has offered permanent residency permits for ex-pats (Ataullah, 2018). Therefore, it can be predicted that ex-pats cannot face accommodation issues in Qatar. Accommodation is about the settlement of ex-pats, who are reaching Qatar for employment. The availability of proper houses is essential for them to work in Qatar at a low cost, which is their main target. This increased the chance that the population will show further increase, which ultimately creates a need for effective land-use policies. Therefore, the requirement for developing efficient land utilisation strategies in Qatar can be fulfilled using this study.

3.5 Summary

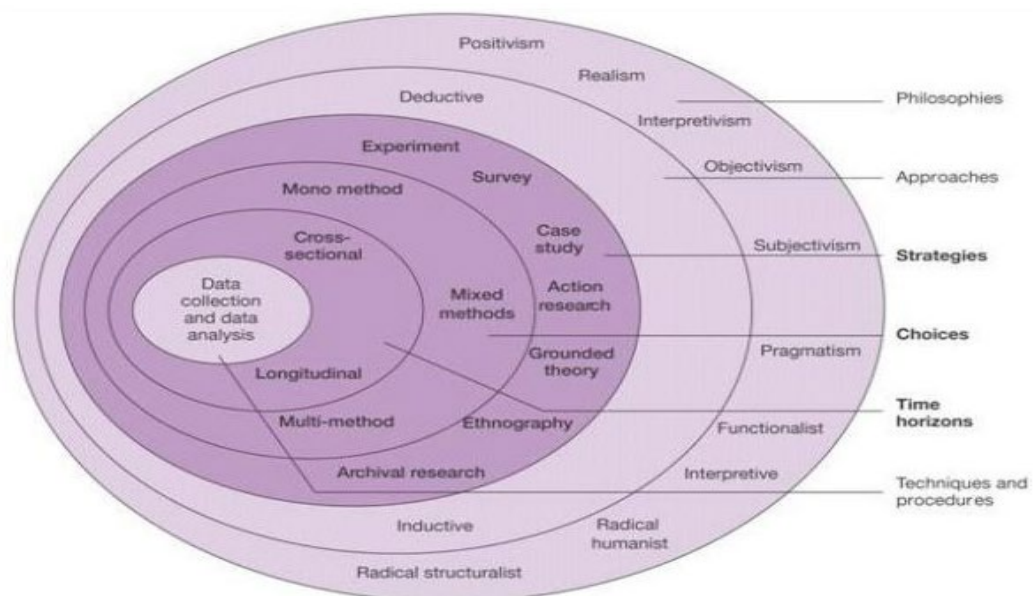
Conclusively, the research has specifically targeted the public sector and region of Qatar. This is the reason that the land management of Qatar is critically focused on this research. Using data analysis, strategic framework recommendations can be produced, which could be utilised by public sector firms to bring change in their strategies. It can be predicted that research findings of this study can likely deliver positive changes in procedures used by the public sector for land management or current strategies influencing negative impact can also be identified for their elimination. Here, the outcomes of this research can be seen in terms of higher sustainability of the public sector and increased contribution to the achievement of Qatar National Vision (QNV) 2030.

Chapter 4: Research Methodology

4.1 Introduction

The research methodology is the essential part need to consider while conducting any scientific research. As there are many research methods identified by the researchers, however; it is crucial to figure out the most appropriate way for the selected study. In this chapter, the most appropriate method would be selected along with the description and some research techniques also be given that could be used for the chosen research method. Therefore, this chapter covers research approaches, research designs, research strategy, research techniques, and data collection methods, ethics of methodology, data analysis, research contribution, and the most crucial validity and reliability of the data.

The world-famous 'research onion', discussed in the book 'Research Methods for Business Students' of Saunders, Lewis and Thornhill (2009) helps with this. Based on the peel of the research onion get insight into the underlying issues that underlie this methodological choice. The research onion is from outside to the inside of six skins, constructed from general to specific: Research Philosophy, Research approach, Research strategy, methodological choices, time horizon and techniques and procedures.



(Source: Saunders, Lewis and Thornhill (2009))

4.2 Research Philosophy

As the research was based on a mixed methodology, it is essential to consider the research philosophies, which may describe the critical aspects of the investigation. Below, some theories

given that were used in the research for different purposes. Bryman (2016) research philosophy is a part of the research method, including essential aspects that are necessarily required to take an overview of the entire world. Each philosophy has its worth, and they are used differently for different purposes:

1. **Positivism:** Positivism is the philosophical foundation of the scientific method based on empiricism that all knowledge relies only on experience. In this sense, Lune and Berg (2016) have defined the most common scientific world view. The positivist wants nothing to do with the metaphysical, subjective, non-material. Only what is perceptible with the five senses is real; Everything else exists only in the realm of imagination is not knowledge.
2. **Realism:** This type of philosophy is the symbolic representation of independence, which is associated with the reality of a person's mind. This philosophy contains such significant aspects that are necessary to gain knowledge and mind development (Hughes and Sharrock, 2016).
3. **Interpretivism:** According to Padgett (2016), it is necessary to understand differences among people in social science research. In this way, there is a difference between people and objects can be made, because a human can interpret the world and behaviour of people. It means, by using this philosophy; the researcher can understand the empathetic behaviour to be able to understand the significance of social actors.
4. **Pragmatism:** In the research philosophy, this position evades between positivism and constructivism. The pragmatism is wholly based on the research question (Walliman, 2017). It is the field of research philosophies used according to the different issues or parts of the research.

4.3 Research Approaches

The most commonly used research approaches are either qualitative and quantitative, required for the collection and analysis of data so that the reader can easily able to understand the research phenomenon (Palinkas and Hoagwood, 2015).

These methods also a line or present a structure, in writing, the process and the results of the investigation in the form of research reports. The choice of method depends according to the researchers as to the nature of the measure was analysed—some of the topics discussed by the work best in the framework of a qualitative approach. There are many discussions between

universities in recent decades on the strengths and weaknesses of the two research strategies, especially; in the field of social sciences (Archibald, 2016). On the one hand, some have two concepts as separate entities based on different interchangeable visions of the world. Both approaches are used, especially in the context of this investigation, also known as the concept of research deductive, inductive research approach to social science research.

4.4 Qualitative Method

This type of research approach is used for essential and selective research topics which require vast and descriptive information to conclude result. Moreover, qualitative research studies have no boundaries and restrictions as it does not require any sequential process. In such studies, after collecting data, it is necessary to make a hypothesis or questions for achieving research aim. It is based on an investigative or exploratory method, often before quantitative, to refine research questions or propose new items concerning the study question. According to Nardi (2018), the qualitative analysis seeks to understand the phenomena within their usual context is based on detailed descriptions of situations, events, people, interactions, observed behaviours, documents, and other sources that seek the end of pretending does not generalise results.

4.4.1 Characteristics of Qualitative Approach

The characteristics of the qualitative approach are as follows:

- The researcher poses a problem but does not follow a clearly defined process.
- The researcher observes the facts and during the process develops a coherent theory to represent what he follows.
- In most of these investigations, hypotheses are not contrasted, but they are generated during the process and are perfected as more data is collected.
- The approach is based on data collection methods that are not standardised or completely predetermined.
- The researcher uses techniques such as unstructured observation, open interviews, document review, group discussion.
- It is a holistic method that seeks to consider data as a "whole", without reducing it in its parts.
- The qualitative approach evaluates the natural development of events; that is, there is no manipulation of reality.

- Qualitative research is based on interpretation for understanding the personal views as to gain in-depth and accurate knowledge about the subject matter.
- Part of constructivist postulates, based on the fact that reality is constructed based on the interpretation of each individual.
- This approach does not require observation only but a series of representations including verbal and interview documents, conversation data, annotations and footnotes.

4.5 Quantitative Method

A quantitative approach is an observational approach that requires to follow a sequential process. It is the approach which has a fixed process and just needs to follow these steps for obtaining accurate results. Likewise, if considering the scientific research method, there must need to fulfil actions such as research problem, hypothesis or questions, analysis and discussion, conclusion. However, the central part of this research approach is that there should be presented variables or quantifiers, which can be measured easily (Patten and Newhart, 2017).

According to O'Sullivan and Rassel (2016), the principle of a random selection of a sample of the population is applied to avoid that the interpretation of the results is biased. This means the following procedure:

- Define the research topic
- Show existing theory
- Determine hypothesis
- Data collection
- Statistical analysis
- Confirm or refute a hypothesis

Characteristics of Quantitative Method

The steps that need to follow in the quantitative method requires:

- a) Enlist the quantifiers or variables from the data extracted for the research
- b) Go through the variables and understand the terminology appropriately
- c) Considering the definition and meaning of the variables depict the information whether the variable is independent or dependent
- d) Checking the method for measuring the variables,

- e) If the measuring process is already existed then check out its reliability, and validity
- f) Provides information about the level of measurement applied to each variable
- g) Also includes information related to the encoding of variables in the program (numerical representation of variables).
- h) Apply a pilot test of the measuring instrument.
- i) Modify, adjust and improve the measuring instrument after the pilot test.

The current research is based on a mixed-method approach for which both the deductive and inductive approach used. However, the deductive approach was used to develop a theory on strategic development framework successfully and optimum utilisation of land in Qatar by the Qatari public sectors and a hypothesis to design research strategy and test the hypothesis. The deductive approach is considered to highly effective and useful in the context of current research by highlighting the theoretical approach and then processing data collection techniques through statistical tests (Ponto, 2015). The procedure is correctly used to conduct an in-depth theoretical analysis of already published sources of data on strategic development framework of Qatari public — on optimum utilisation of land in the country to promote economic development and growth.

4.6 Research Design

The research design is the set of procedures by which scientific problems are raised, and scientific hypotheses are tested. A method is a procedure to deal with a set of challenges. In social science, the research design is the strategy for research and exploration of the unknown. The scientific method and objective knowledge of the world constitute the main distinction between science and pseudoscience (Fellows and Liu, 2015). Before creating a research design, first need to formulate a problem, the main question and additional questions. Therefore, first, need to define the problem. A research design should present an overview of what was used to carry out the project investigation (Burton and Cherry, 2018). It should describe where and when the research was conducted, the sample that was used, the approach and the methods that were used.

4.7 Types of Research Design

For the current research, the mixed methodology was used which provide an excellent structure to the investigation. For getting required results, sampling, observational, statistical and operational research designs were used that are mentioned below in detail. Therefore, these

research designs were used to develop a practical strategic approach for optimum utilisation of land by Qatari public sectors. It is used to prepare a research framework to describe the detailed processes and procedures that could be used in getting the necessary information and solving the research problems related to the economic development and growth of ordinary citizens of the country.

4.8 Sampling Design

In scientific research, it is common for samples to be used as a means of approaching knowledge of reality. However, for this to be possible so that through the examples it is possible to reproduce the universe with the precision that is required in each case, the sample design must adhere to the principles contained in the sampling techniques. There are two types of sampling design used commonly in a deductive approach.

- Probabilistic (random) sampling: It is the type of research sample method in which the data can be sampled (small group of the population) through arbitrary selection criteria. In this type, everyone must have equal right and opportunity at the time of selection. Likewise, if a group of 100 people, then each person have a 100% chance of being selected. Through this sampling, a technique researcher can easily organise a representative sample of the population. To choose a small group from the entire community, the random selection method must incorporate statistical theory (Kumar, 2019). After the responses collected, predict whether the reactions were coincided with the general population or not.
- Non-probabilistic sampling (not random): It is the research sampling method in which the selection relies upon subjective judgement regardless of random selection. In the non-probabilistic sampling technique, equal opportunity is not granted to every person for participation in the research. It is beneficial for the study types that are exploratory based on a pilot survey (questionnaire) in which the sample size used is smaller than predicted (Creswell, 2017). Time and cost are the reasons based on which the researcher selects non-probabilistic sampling instead of random probability sampling. It is less restricted, and feasible depends on the researchers' knowledge and experience. Qualitative research, including observational method, usually approaches to this sampling technique.

4.9 Observational Design

An observational study is a specific type of education that is defined as having a statistical or demographic character. They are characterised because the work of the researcher is limited to the

measurement of the variables that are taken into account in the study. However, unlike other study methods, an observational study was difficult to reproduce in the future by other researchers which limit experimentation in this regard. Observational studies allow adapting to the specific needs of each investigation (Vaishnavi and Kuechler, 2015). However, observational research always can be located within one of the two main categories.

4.9.1 Transversal studies:

They are characterised by collecting the data at a specific time of the object of the investigation. They allow getting a more in-depth idea of the reality studied. However, these types of studies lack short projections, since their research is limited to a specific moment of the object studied.

4.9.2 Longitudinal Studies:

This type of observational study is characterised by being developed over a period that has been previously specified. Unlike, cross-sectional studies, they have the advantage that the researcher can easily observe the evolution occurs in processes reviews, which further assists in collecting more accurate and relevant data (Antwi and Hamza, 2015). Besides, longitudinal studies can be retrospective or prospective (depending on the observation of the data with the expectation of obtaining conclusions regarding the future or the past).

4.10 Statistical Design

Statistical research is an activity that appeals to various techniques to reach the essence of reality. The process of statistical analysis involves a series of steps; embarking on research without prior criteria or adequate preparation may require more time than programmed (Creswell and Clark, 2017). The formulation of the problem is the initial step of the investigation procedure that was extended by a series of courses until finding answers to the challenge posed. A correct approach or formulation of the problem is essential that establishes the limits of time and space parameters in which the investigation was carried out accordingly the probabilities of the investigator not to go astray tend to be higher (Venkatesh and Sullivan, 2016).

4.11 Operational Design

It is the process in which statistical design needs implementation by the help of the following step;

- Selection and determination of the population or sample and the contained characteristics to be studied. In case, for taking an example, it is necessary to determine the size of the sample and the type of sampling to be performed (probabilistic or non-probabilistic).
- It is obtaining the data. This can be done by directly observing the elements, applying surveys and interviews, and conducting experiments.
- Classification, tabulation and organisation of data. The designation includes the treatment of the data considered anomalous that may, at any given time, falsify an analysis of the statistical indicators. The tabulation implies the summary of the data in tables and statistical graphs.
- Descriptive analysis of the data. The investigation is complemented by obtaining statistical indicators such as measures: central tendency, dispersion, position and form.
- Inferential analysis of the data (Leung, 2015). Data processing techniques are applied that involve probabilistic elements that allow us to infer conclusions from a sample to the population (optional).

The research design provides a direction on how to gather data from the interested people to participate in the research to evaluate the optimum utilisation of land through enhanced policymaking of Qatari public sectors. The qualitative data was used for the interpretation of results and analysis of findings through the unstructured format of data collection because it is a very flexible form of research (Mitchell and Jolley, 2010). The sample size is needed to be representative and larger because a questionnaire was prepared and distributed among the interested families online. Surveys and interviews methodology is used to determine how people think about the participation of Qatari public sectors in the optimum utilisation of land through useful strategic development framework (Rubin and Babbie, 2016). Secondary sources of data collection are also used to determine the importance of a practical strategic approach for optimum utilisation of land by Qatari public sectors. Both the primary and secondary sources were used to assess the importance of an efficient strategic plan for optimum utilisation of land by Qatari public areas for ensuring continuous and sustainable economic development and growth.

4.12 Research Strategy

When conducting social science research, it is essential to be focused on the appropriate research strategy. Research strategies comprehensively present the most common methodological

formulations that social science researchers use to approach their research questions and develop their projects (Johnson and Mycoff, 2019). In addition to exposing the main sampling techniques for the different types of study, the strategies are presented as role models when each of them integrates a set of procedures organised in a planned way (Glogowska, 2015). However, to achieve an objective in the search for knowledge. Some research strategies belong to a deductive or inductive approach; however; often, this distinction cannot be made clear. Depending on the purpose of the research, the following strategies can be distinguished:

- Survey: It is the research method used to solve research problems only employing descriptive terms and by using variables (non-descriptive). Survey method includes systematic information and surety of rigour present in the report. Hence, in this regard, it is feasible for providing descriptions about research, and detecting the pattern creates between the already established and currently described relationships of the events (Parker and Northcott, 2016). The survey can be useful in such circumstances as:
 - a. Through the survey, the researcher can be capable of collecting data from a larger sample, which can lead to generalisability of the results.
 - b. It can be useful where the other techniques of direct observation get fail
 - c. The survey is more helpful in collecting people beliefs and views. Research studies having clear objectives and large sample size mostly used this method to accomplish a goal.
- Case study: a Case study is a research tool and a learning technique that can be applied in any area of knowledge. The fundamental objective of the case studies is to know and understand the particularity of a situation to distinguish how the parties work and the relations with the whole (McKim, 2017). The objectives of a case study can be classified into:
 - a. Exploratory objectives: whose results are used to formulate a question to initiate an investigation.
 - b. Clear objectives: they help describe and better understand a particular case.
 - c. Explanatory objectives: guide to facilitate the interpretation of the case.
- Grounded theory: It is seen as the inductive approach in which data is collected without using a theoretical framework. According to Burr (2018), grounded theory is developed based on data generated by observations. Often, the deductive approach also applied to create predictions that are verified with a novel set of observations.

In the current research, survey research strategy was focused on gaining the responses of the selected participants on practical strategic approach for optimum utilisation of land by Qatari public sectors. Brannen (2017) identified three characteristics of survey research

1. Survey research used to describe specific aspects of a given population quantitatively. Therefore, these aspects involve finding the relationships among variables.
2. The data collected from participants and required for survey research are collected as subjective.
3. Finally, this strategy used a selected population from which the findings can be generalised to the community.

In this research strategy, independent and dependent variables are used to identify the expected relationships among these variables. The survey research is just a tool for collecting data; however; it's further analysed by using some statistical tools and measurement scales for proving the reliability and validity of the data. The data collected through this strategy was beneficial to determine how effectively inductive or deductive approach be adopted to gather information about the willingness and interests of the people to participate in the data collection process of public sectors participation in the optimum utilisation of land in Qatar (Ary and Walker, 2018). The strategy is guided according to the research plan, and questions are prepared to determine how effectively Qatari public sectors participate in optimum utilisation of land through strategic development framework. The primary objectives of the proposal are achieved to determine the extent to which the contacted people have relevant knowledge and information; the amount of time and their availability in show their willingness to participate in practical strategic approach for optimum utilisation of land by Qatari public sectors (Johnson and Christensen, 2019).

4.13 Research Technique

The current research was using mix methodology for which different techniques used to collect the data. For collecting primary data, a survey technique was used whose instrument is the questionnaire. This technique is widely used in studies of Social sciences, although; the terms survey and inquiry are often used to refer to the same procedure, the review is the technique, and the questionnaire is the instrument. The analysis is a technique of direct observation of reality whose main objective is to quantify the obtained data. There are two variants: the survey of facts, and the study of judgments or opinions (Nardi, 2018). In the first case, the events that relate to the

respondent or people known to the research topic; however; no personal opinion of the respondent is required. The second case, the conclusion is collected based on what Wondering depends on the judgment of the person being asked. For the latter case, some interview questions prepared which were asked only from industry professionals. They were not a part of the sample; however; their opinion matters a lot for this research. There are some limitations to the survey as a research technique. The main limitations of using the study and a questionnaire instrument as a research technique are the following:

- In the survey technique, the questionnaire is static and should not be varied.
- Preparing a questionnaire is a difficult task which requires attention to numerous details.
- Respondents collaboration requires that the results of the survey based on the number of people give respond and the accuracy of their answers.
- In the last, a limit to the number of issues addressed in a survey.

4.14 Research Instrument

The questionnaire was prepared and used as the research instrument for the survey participants. The survey participants get instructions about providing detail information for each question which was very helpful for determining or analysing the results of the study. For interviews, some interview questions were asked to the industry professionals to know their views about the success or failure indicators of the practical strategic approach for optimum utilisation of land by Qatari public sectors (Rahi, 2017). Also, interviews are conducted from the selected participants to determine their responses on how the Qatari public areas contribute their part in the strategy development approach for optimum utilisation of land to ensure continuous and sustainable economic development.

4.15 Components of Research Questionnaire:

The questionnaire was conducted to investigate the practical strategic approach used by Qatari public sector to ensure optimum utilisation of land. The research questionnaire enhanced the awareness about general welfare and to promote the economic development of the country (Brannen, 2017). The first component of the research was based on demographic information of participants such as; age, gender, education and their annual income. The second component was based on the questions that determine the information on strategic development framework for the optimum utilisation of land in Qatar.

4.16 Data Collection

Researchers most commonly used two types of data collection, namely primary and secondary:

Primary data collection is the kind of technique in which the researcher put efforts to make the data unique by using its instruments. However, the secondary data collection is based on the previous assumptions and results which has obtained by other researchers previously. This secondary data can be extracted from the published books, articles, magazines and websites. It is noteworthy that primary data is independent while the secondary information is dependent on the primary. Once the primary research was carried out, and the result is generated, then this data is used as a secondary for the viewers.

4.16.1 Primary Data Collection

Generally, the researchers used the primary technique to perform social researches that require current data which can evolve from time to time, to conduct primary research or data collection researcher use multiple tools to ensure data. There are several methods which can be taken for primary data collection, such as interview, survey, group session, and observation.

Interview: It is the method in which two persons are involved. One is the interviewer, and the other is the interviewee. In the session, the interviewer asked the predetermined set of questions from the interviewee. The interviewee has the right to deliver response either in written form or verbal.

Observation: In this method, human thinking and prejudice are involved. Therefore, it is necessary to have noticed what is in the real world and what is going to be established in the research (Creamer, 2017). It is a rare technique used by the researchers previously. It requires senses for observing the real world, once the sizeable observational data is collected then interlinked it correctly with the research.

Group Session: It is mostly used the qualitative technique by the researcher in which groups of participants are formed based on the specified criteria. In this type, the focus group is established, which is different from the survey, as, in this research, participants talk on specific group issues, and a limited number of participants enrolled in groups. This type is mostly used in biomedical investigations. The survey provides a large volume of data and views of people about subject matter whereas, in a group, session participants provide the knowledge about the effects they get from the brand through their attitude and behaviour.

Survey: it is the method most commonly used in quantitative research, the data can be obtained from the questionnaire which has passed to the selected sample population. There are several categories in the survey like:

- According to the objectives can be descriptive or analytical.
- According to the type of response such as open or closed-ended response.

4.16.2 Secondary Sources of Data Collection

The secondary sources of data collection were used to get the initial insight into the research problem on the conduct of a practical strategic approach for optimum utilisation of land by Qatari public sectors. To gather necessary information about the web reality series with the proposed research proposal, different books, journals and online materials are observed and analysed by collecting information through the website of <http://scholar.google.com> with a detailed review of the literature to be published on the given topic of the research.

The researcher performing secondary research used data which has published and collected previously by other researchers. While conducting secondary research, it is noticed that whether the previous information is valid or not. In this research, it provides an ease to the researcher also save time and accelerates the overall procedure of the study. The secondary sources can be website, ebooks, articles, blogs, reports, and magazines. From the viewpoint of Palinkas and Hoagwood (2015), data collection is the most crucial part of the research that gives support to the knowledge generated later based on collected data. However, data collection alone has no importance and does not produce quality knowledge. The deductive approach used in the current research is classified into three categories: In-depth interview, observation methods and review of published data. However, to provide support and to improve the quality of the quantitative survey, secondary data was also provided.

4.17 Ethical Considerations

This section must penetrate all the essential elements of research and associated with the ethics, however; ethics of study is different for the specific events or situations represented by the practice of profession guided by internal ethics. According to Johnston (2017), ethics is not only purposeful for defending the research integrity but also for protecting the researcher against corrupt practices. Undeniably, ethical consideration is another most important aspect of accomplishing the research

goal. The ethical research consideration must encompass truthfulness and honesty so that the research generates accurate and valid results which further provides benefit to the third person.

Following are some code of ethics that regulate the conduct of the researcher:

- Confidentiality: The confidentiality and use of the information obtained were discussed with the persons or legal representatives of organisations or minors. Establishing it from the beginning and having the permission of the participants, especially in the electronic register of information.
- Record Keeping: The registration of the information must be safeguarded by the researcher and take care of its use when creating, storing, accessing, transferring and disposing of these records, whether written, automated or by any means.
- Information Disclosure: Confidential information was disclosed with the consent of the participants in the investigation by legal mandate or with valid legitimate purposes such as; provide professional services to the person or persons involved in the investigation process, provide better professional advice, protect them from harm, or to obtain payment for services, limiting the disclosure of data to the minimum necessary according to the objective.
- Confidential information in databases: The databases must have codes that prevent the inclusion of personal identifiers, as well as the use of protocols. If it is not possible to delete or encrypt personal data, the informed consent of the participants was available.
- Institutional approval: In institutions or host organisations, the corresponding permission must be obtained to carry out the investigation, providing precise information on the purposes, carrying out the survey according to the approved research protocol.
- Informed consent used before investigation: An understandable language was used for the participants when obtaining informed consent, speaking about the nature of the inquiry and the freedom to participate, decline or withdraw from it, informing them of the consequences of their decision. The factors that may influence the desire to participate (risks, discomforts, adverse effects, limitations of confidentiality, and other relevant aspects) was informed. When working with students or subordinates in charge, one must be punctual with the adverse consequences when declining or withdrawing from the investigation.

- Provide Participants with information about the research: Participants should be given the expedited opportunity to obtain appropriate information about the nature, results and conclusions of the investigation, correcting any confusion they may have. If for reasons related to scientific or human values, there is a delay or retention of information, measures were taken to reduce the risk of damage.

4.18 Ethics of Methodology

Ethical consideration was strictly applied to the research because it provides the direction to ensure no information is collected, shared or distributed legally without adopting illegal practices of data collection, analysis and observation (Lo, 2009). Data collected for this research was first acknowledged by all participants because their permission and privacy are the most important to more onside. The participants who were involved in the study get the consent form and all the gathered information was kept at a secured location. The information collected from the selected respondents is considered to be highly relevant in the context of the research and only discussed and shared with the research supervisor. All the participants get strict instructions about not to share the data with others and kept it as highly confidential. It is ethically wrong to share the data of any research held by the institution without the permission of the researcher, therefore; sharing it with others is an illegal act (Larson, 2017),

4.19 Data Analysis

For the current research, data analysis was considered to be highly relevant in the context of the strategy development framework for optimum utilisation of land by Qatari public sectors. It is best to obtain statistical data from primary sources than secondary sources. First, data in the primary sources tend to be more complete than the secondary sources; for example, the detailed breakdown of the data on primary sources, often omitted when these data are reported in secondary sources. Secondly, in a primary source, statistical data are frequently supplemented to that relevant information, such as the methods of collection of such data, and changes in definitions. Data analysis was determined whether or not Qatari public sector participation in the strategic development framework for optimum land utilisation has contributed to the general welfare and national economic development of the country in the Middle East region. The data collected from the secondary sources helps considerably in the assessment and interpretation of the data; however; it is often condensed or even entirely omitted when data are republished on secondary sources.

Finally, there is always the possibility that errors are not contained in the primary cause may be introduced in the secondary sources due to personal mistakes and typographic committed to transcribing the data.

4.20 Pilot Study or Test Study

For the current research, it was essential to check the feasibility of the land optimisation research in the execution of both quantitative and qualitative methodological procedure. For this purpose, the pilot test questionnaire for the satisfaction of industry professionals was applied who were not part of the sample; however, they presented the same characteristics. There was two pilot test conducted to increase both the reliability and feasibility of collected data. Therefore, it is good to find the reliability coefficient, and the steps proceeded as follows:

- * Application of the pilot test to a group of subjects belonging to the study sample, with characteristics equivalent to it.
- * Coding of responses; Transcription of the answers in a double-entry tabulation matrix with the support of the SPSS statistical program latest version.
- * Interpretation of the values taking into account the Likert scale.
- * Determination of results with simple tabulation and cross-tabulation

The pilot study was undertaken with the industry professionals belongs to various sectors. They were interviewed for the strategic approach used for optimum utilisation of land by the public area of Qatar. Then the content analysis was performed based on their answers in the findings section. The pilot study was also based on the survey technique, which used the questionnaire as an instrument. The online poll was distributed to the participants through a website named survey Gizmo. After this, the collected data was analysed or investigate utilizing statistical methods. The analytical method applied to the collected data made the results more valid and feasible; therefore; the study could be used for future researches. The result of this research describes all the processes, analysis, incidents and other technical data of the investigation as well as the results of the study. The questionnaire was based on the demographic information of the participants in which some initial questions asked about age, gender, education, and their annual income. Afterwards, the rest of the items was based on the strategic development of the framework used for the land utilisation in Qatar by the public sector.

4.20.1 Validity and Reliability

Based on the pilot study, it is essential to evaluate the reliability and validity of both the process itself and of the information collected. Otherwise, the research would not be relevant and may not reflect the social reality which is intended to describe. For the current study, the questionnaire is a suitable measuring instrument that registers observable data that genuinely represent the concepts or variables. Infield investigations, both quantitative and qualitative; it requires the use of appropriate devices to ensure that the information obtained is valid. For that reason, the tools used was trustworthy to replicate them in similar conditions yield approximately the same results. Secondly, it was accurate and effectively measured the required results. Besides, a measuring instrument meets the properties of conceptualisation and representativeness.

For every research study, two essential aspects should be considered while collecting and interpreting data one is validity, and other is reliability. Employing validity, the researcher can check whether the content is determined or not, and the researcher can review the indicators whether it is related to the research questions or not. Efficacy is the check whether the applied test and hypothesis are applicable, variables are related to the subject and whether they are measurable or not. Green and Wisdom (2015) proposed topology for checking the validity of the research based on different types of validity. Moreover, Green and Wisdom (2015) argued that the researcher must include this topology for checking the validity in his research study. There are five types of efficacy based on Green and Wisdom (2015) topology:

1. Descriptive validity. It refers to the one that is related to the initial stage of the investigation. It usually involves data collection. The main result is the information that describes what was observed and experienced. For this, the selection of the language and the relevant data is essential.
2. Interpretive validity. The certainty in the interpretation is valid if the actors can confirm or recognise the findings of the research in particular.
3. Theoretical validity. The theoretical validity is a more abstract analysis than the descriptive and interpretative validity, related to the physical and mental immediacy of the studied phenomenon. The constructions and conceptual frameworks of the researchers, be they known theories or metatheories, intrinsically define the collection and interpretation of the data at the initial stage of the investigation.

4. Generality. This type of validity refers to the degree to which the explanation is accepted to be generalisable. However, it is pertinent to clarify that for some qualitative researchers, generalising discoveries are considered of little importance.

5. Evaluative validity. It refers to the application of an evaluation framework, which is similar in qualitative and quantitative research. It is pertinent to clarify that the evaluation cannot be considered as a conclusive statement.

The instrument has a validity of the concept; the scores for the subjects vary following the predictions that are inherent to the theory underlying the concept. The process of validation of a construct is linked with the approach. It was not possible to carry out the validation of the construct unless there is a theoretical framework to support the variable concerning other variables.

4.21 Reliability of the Data

For the current research, there were several methods to estimate the security of a pilot test, which differ in the way they consider the sources of error. The most common are:

1. Measures of stability
2. Equivalence Measures

Measures of stability. To check the balance of data, we have considered retest reliability. It means the ratio was obtained by applying a test to a group of Individuals meet at two different times and correlating the two series of points. When using the measure of stability, the specification of the time was elapsed between the two testing situations, as well as a description of the relevant experiences involved.

Equivalence measures. To obtain a measure of equivalence, applied two ways (with content means and variances are the same) of a test on the same day at the same group of individuals and correlated the results obtained. This procedure avoids the intertemporal effect on results, as well as that of learning on the part of the participants.

A survey is a recurring tool that helps to gather information on public opinion regarding a specific matter. To ensure that the feedback received is somewhat reliable, it is necessary to use the Pearson correlation coefficient to estimate the reliability of the qualification issued by a single judgement. Safety of the research refers to whether the same response is obtained using an instrument to measure more than once (Dikko, 2016). Reliability between evaluators, as the name implies, refers to the measurement of result sets obtained by different evaluators using the same methods. The

benefits and the importance of assessing reliability among qualifiers can be explained by referring to the subjectivity of the evaluations.

In a summarised way, the validation and reliability methods that have been traditionally privileged are the positivists, finding the following: the validity of constructs or theoretical; the internal validity, located in the perspective effect and cause the external validity, verifying the generalisation of results. On the other hand, reliability from this positivist perspective points to the replicability of a study; therefore; the same results are obtained through the same procedures and tools.

4.22 Research Contribution

The research conducted here identified how successfully Qatari public sectors participate in the national economic development by developing a strategic framework of optimum utilisation of land. The study was based on specific aims and objectives to investigate how institutional reforms be carried out to ensure the optimum use of the property by Qatari public sectors. The research was adopted both primary and secondary sources of data collection qualitatively and quantitatively to investigate the research results and to analyse what contribution public areas make in the national economic development and welfare of households in Qatar. The research was provided with a detailed study on how effectively land in Qatar can be used by the public sector to gain maximum productivity through optimum use and how effectively the government can manage it.

4.23 Summary

The research methodology chapter describes all the essential research methods used for completing the dissertation. It includes research techniques, research strategies, research approaches, data collection from both primary and secondary purpose and then how to analyse that data by using some specific tools and instruments. Research strategies can be different for the different type of researches like explanatory, exploratory and descriptive. Explanatory investigations are mostly qualitative, while, exploratory analyses are quantitative, and descriptive researches can be qualitative or primarily quantitative includes lengthy and descriptive data like interview and case studies. Research approaches can be qualitative and quantitative depends upon the research requirements. Primary data collection method can be challenging to practice, requires considerable effort, time and cost but provides useful and accurate results if the researcher has an understanding of the research topic.

On the other hand, secondary research data collection is easy and less time consuming and cheap. However, the validity in secondary research can be low or high depends upon the data extracted. Most appropriate and valid secondary data sources are articles and journals. Sampling method and instruments (questionnaire) used for this research also presents the validity and reliability of the data. It makes the study durable, therefore; all the primary data was collected employing questionnaire. Hence, the data collection method can be multiple: survey, interviews, questionnaire, group session, case studies. Based on respondents, answers were measured by using an appropriate measurement tool. Moreover, the second instrument also used in the current research that was interview taken from the people of Qatar. This research work is associated with the development of a Strategic Framework for Optimum Land Utilisation in the Qatari Public Sector.

Chapter 5: Analysis and Findings

5.1 Introduction

In this chapter, findings are explored based on quantitative and qualitative analysis. Here, quantitative analysis is done using descriptive statistics, frequency analysis and correlation. Whereas, qualitative analysis is performed using the content analysis technique. Moreover, demographic analysis is used to evaluate whether respondents are eligible to take part in data accumulation.

5.2 Data Management

When it comes to data management aspects, it can be demonstrated that data in this research is sourced from both qualitative and quantitative sources. Quantitative data is accumulated by the use of survey questionnaires, which are formed upon the premise of close-ended questions. Here, the instrument is designed based on the 5-point Likert scale. On the other hand, qualitative data is sourced using interview questions or apparatus, which open-ended questions are used in conducting interviews from participants. Sample size targeted for the accumulation of survey questionnaire data is 100 respondents, whereas, meetings are held from 16 participants. Probabilistic (random) sampling technique is used to develop a group of respondents for the survey questionnaire. In contrast, non-probabilistic sampling is targeted to form up a group for sourcing data from interviews.

When it comes to the profile of respondents, they are from the public, and private sector organisations from Qatar and further information regarding their profile can be evidenced from the demographic analysis. Reliability analysis is performed using Cronbach Alpha, which can be evidenced from the below section, whereas pilot testing ensures the validity of this research. Other statistical tools utilised are SPSS, which plays a significant role in the evaluation of regression analysis, correlation and descriptive statistics. The primary justification behind the selection of this statistical tool is that it can ensure the effective presentation of data, which can enable a review of in-depth insights relating to a research problem.

5.3 Reliability analysis

Reliability analysis is a technique that is used to allow the researcher to arrive at the level of quality of the data. Since both quantitative and qualitative methods had been used, therefore in this section

reliability is performed on both of them. For quantitative data Cronbach Alpha, the technique had been used, which is supportive in the interpretation of the research's reliability. On the other hand, pilot testing had been used to gather information on the security of data arising from qualitative analysis.

5.3.1 Cronbach alpha on quantitative data

One of the parameters in this analysis is that Cronbach alpha should have to be higher than 0.6 or 60%, which shows right consistency level in data set and this can be prioritised for quality research output.

<i>Reliability Statistics</i>	
Cronbach's	N of Items
Alpha	
.935	21

Reliability analysis performed on data set obtained from public sector respondents is showing Cronbach alpha of 0.935 on 21 items, which is interpreting the fact that data collected from respondents is valid. On the other hand, data set obtained from the private sector is also analysed to check its reliability level and Cronbach alpha obtained is at 0.878, which means that validity is maintained at an acceptable level. Data can be prioritised to predictability research outcomes.

<i>Reliability Statistics</i>	
Cronbach's	N of Items
Alpha	
.878	21

The reliability statistics analysed below is gained on overall data set of research, including data from both sectors. The Cronbach obtained is 0.928 and showing higher reliability or consistency of data. Therefore, there is no need to change data collected from respondents, and it can be prioritised for interpretation of research facts.

<i>Reliability Statistics</i>	
Cronbach's	N of Items
Alpha	

5.3.2 Small scale Pilot testing for qualitative data

Another parameter of reliability analysis, which is used, is pilot testing. The technique is perfect for examining the reliability of the questionnaire because it is content and content's meaning might become different due to the incorrect use of words or even tense form. Thus, the pilot survey is performed from 10% of total research participants who have elaborated that there are no flaws in the research instrument, and this can be effectively utilized in data accumulation procedure. Pilot survey (questionnaire) in which sample size used is smaller than predicted, and the respondents selected in these surveys support the assessment of the inquiry, where they interpret whether survey questions designed are appropriate or not. This type of data is influential in the identification of research instrument validity, or it shows whether instrument intended to have any flaws in it in terms of structure, grammar or other technical aspects, which can hurt the potential to respondents to understand it.

5.4 Demographic analysis

In this section, demographic factors are observed. This type of observation in research is significant to evaluate whether respondents are eligible, and they can interpret quality opinions in the study or not.

1. PLEASE SPECIFY YOUR GENDER.

☐ 1. Please specify your gender., Male
Respondents , 56

☐ 1. Please specify your gender., Female
Respondents , 44

1. Please specify your gender.

	Frequency	Percentage
Male Respondents	44	44%
Female Respondents	56	56%
Total	100	100%

Gender demographics identified in the above table is showing a higher proportion of male respondents in contrast with female participants. This can be because a higher percentage of male employees are in the public and private sector of Qatar in comparison with the female population.

2. PLEASE SPECIFY YOUR AGE GROUP.

☐ 2. Please specify your age group. , 45 and above, 30

☐ 2. Please specify your age group. , 36-45 , 21

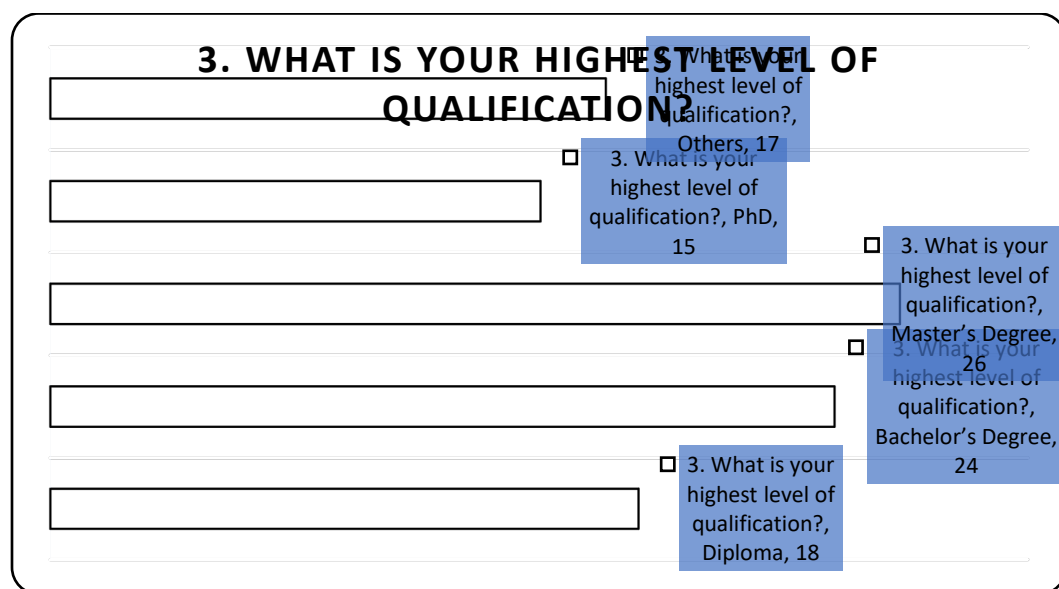
☐ 2. Please specify your age group. , 25-35 , 35

☐ 2. Please specify your age group. , 18-25, 14

2. Please specify your age group.

	Frequency	Percentage
18-25	14	14%
25-35	35	35%
36-45	21	21%
45 and above	30	30%
Total	100	100%

The demographic analysis presented above is revealing age group analysis, which is concluding that a higher proportion of participants from age grouped between 25-35 years took part in the research. This elaborates the fact that the majority of participants are mature enough that they can interpret reliable information.



3. What is your highest level of qualification?

	Frequency	Percentage
Diploma	18	18%
Bachelor's Degree	24	24%
Master's Degree	26	26%
PhD	15	15%
Others	17	17%
Total	100	68%

Qualification demographics observed in the above analysis is showing higher participation (24%) from people having a Master's Degree. Another group having a higher qualification is of Bachelor's who have demonstrated a participation rate of almost 24%.

4. IN WHICH SECTOR ARE YOU EMPLOYED?

☐ 4. In which sector are you employed?, Private Sector , 50

☐ 4. In which sector are you employed?, Public Sector, 50

4. In which sector are you employed?

	Frequency	Percentage
Public Sector	50	50%
Private Sector	50	50%
Total	100	100%

Participants are accessed in equal proportion from both sectors, as participation is 50% from each group. This is because differences among their responses can be traced as well.

5. WHAT IS YOUR DESIGNATION?

5. What is your Designation?

	Frequency	Percentage
Employee	42	42%
Manager	31	31%
Executive	10	10%
CEO	17	17%
Total	100	100%

The Designation discussed in the above demographic analysis is showing higher participation from employees as it is amounting to almost 42%. In contrast, other designations of managers have a higher proportion in a group of participants.

6. EXPERIENCE IN HANDLING PUBLIC SECTOR OR PRIVATE SECTOR LAND ISSUES



6. Experience in handling Public sector or private sector land issues

	Frequency	Percentage
Less than 1 year	22	22%
Less than two years	27	27%
Less than five years	38	38%
More than five years	13	13%
Total	100	100%

Experience in handling public or private sector land issues shows that almost 38% of participants have the potential to handle these issues from less than five years whereas 27% of them have dealt with these issues for less than two years.

7. WHAT ARE YOUR ROLE AND RESPONSIBILITIES?

7. What are your Role and responsibilities?

	Frequency	Percentage
Staff with administrative responsibilities	23	23%
Staff with land management responsibilities	33	33%
Staff with construction responsibilities	22	22%
Staff with Marketing roles.	22	22%
Total	100	100%

Almost 33% of staff have handled land management responsibilities, whereas 22% of them have construction-related roles and responsibilities. This creates a factor of ease in the assessment of research purpose.

5.5 Quantitative analysis for Public Sector data

5.5.1 Descriptive Statistics and Frequency analysis

The quantitative analysis of data accumulated from the public sector is obtained through descriptive statistics, which is showing mean, standard deviation and variance analysis.

<i>Descriptive Statistics</i>							
		N	Minimum	Maximum	Mean	Std. Deviation	Variance
Land development	AA1-Public	50	1	5	3.96	1.195	1.427
	AA2-Public	50	1	5	3.52	1.313	1.724

	AA3-Public	50	1	5	3.56	1.128	1.272
Sustainable land development	AB1-Public	50	1	5	4.14	1.262	1.592
	AB2-Public	50	1	5	3.92	1.307	1.708
	AB3-Public	50	1	5	3.72	1.144	1.308
	Valid N (listwise)	50					

Descriptive statistics explored in the above analysis is showing land management outcomes, where mean obtained for AA1, AA2 and AA3 is 3.960, 3.520 and 3.560, respectively. This is showing that responses of participants mostly lie between neutral to agree. The facts observed in response frequencies are showing that more respondents have interpreted acceptance for deciding on criteria in AA1, Strongly agree in AA2 and Agree in AA3.

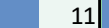
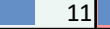
	Proportion					Frequency of Responses				
	SD (1)	D (2)	N (3)	A (4)	SA (5)	SD (1)	D (2)	N (3)	A (4)	SA (5)
AA1										
AA2										
AA3										
AB1										
AB2										
AB3										

When it comes to the outcomes gained for Sustainable land development AB1, AB2, and AB3 shows mean of 4.14, 3.92 and 3.72 respectively. This demonstrates the fact that for AB1 responses are majorly between strongly agree and agree on opinion criteria. Whereas, for AB2 and AB3, they are between neutral and accept, which shows acceptance of facts regarding this parameter. AB1 and AB2 response frequencies are higher for strongly agree as these were amounting up to

56% and 50%. Whereas, in AA3 responses were higher for agree criteria, as the proportion was almost 32%.

<i>Descriptive Statistics</i>							
		N	Minimum	Maximum	Mean	Std. Deviation	Variance
Current land-use practices	AC1-Public	50	1	5	4.04	1.245	1.549
	AC2-Public	50	1	5	3.84	1.167	1.362
	AC3-Public	50	1	5	3.56	1.128	1.272
Impact/benefits	AD1-Public	50	1	5	4.08	0.966	0.932
	AD2-Public	50	2	5	4.02	1.134	1.285
	AD3-Public	50	1	5	3.56	1.128	1.272
	Valid N (listwise)	50					

Descriptive statistics of current land-use practices for AC1, AC2 and AC3, is the revealing mean of 4.04, 3.84 and 3.56 respectively, where AC1 is showing higher values gained for strongly agree and agree. Whereas, the other two questions are showing majority responses lies between neutral and agree. They were overviewing impact and benefits of Public sector, AD1, AD2 and AD3 showing mean values of 4.08, 4.02 and 3.56. The first two values are showing majority responses lie between strongly agree and agree, whereas the third one is showing reactions between neutral to agree to on criteria. Here, respondents have demonstrated that they decide regarding the impact of sustainable land practice in reducing land expenses and financial risks, along with maintaining environmental quality.

	Proportion					Frequency of Responses				
	SD (1)	D (2)	N (3)	A (4)	SA (5)	SD (1)	D (2)	N (3)	A (4)	SA (5)
AC1	 4	 4	 1	 18	 23	8%	8%	2%	36%	46%
AC2	 1	 7	 11	 11	 20	2%	14%	22%	22%	40%
AC3	 3	 5	 14	 17	 11	6%	10%	28%	34%	22%
AD1	 1	 4	 3	 24	 18	2%	8%	6%	48%	36%
AD2	 0	 8	 7	 11	 24	0%	16%	14%	22%	48%
AD3	 3	 5	 14	 17	 11	6%	10%	28%	34%	22%

Descriptive Statistics							
		N	Minimum	Maximum	Mean	Std. Deviation	Variance
Challenges	AE1-Public	50	1	5	4.06	1.132	1.282
	AE2-Public	50	1	5	3.48	1.282	1.642
	AE3-Public	50	1	5	3.50	1.055	1.112
Awareness of frameworks	AF1-Public	50	1	5	3.96	1.195	1.427
	AF2-Public	50	1	5	3.52	1.313	1.724
	AF3-Public	50	1	5	3.56	1.128	1.272
Strategy Development	AG1-Public	50	1	5	3.96	1.195	1.427
	AG2-Public	50	1	5	3.52	1.313	1.724
	AG3-Public	50	1	5	3.56	1.128	1.272
	Valid N (listwise)	50					

The descriptive statistics obtained for challenges showing mean of 4.06, 3.48 and 3.50 for AE1, AE2 as well as AE3 respectively. AE1 has responses majorly lies between strongly agree and agree, whereas, frequency analysis provided below is representing higher responses obtained for Agree responses in AE1, AE2 and AE3.

	Proportion					Frequency of Responses				
	SD (1)	D (2)	N (3)	A (4)	SA (5)	SD (1)	D (2)	N (3)	A (4)	SA (5)
AE1	3	4	0	23	20	6%	8%	0%	46%	40%
AE2	5	6	12	14	13	10%	12%	24%	28%	26%
AE3	3	5	13	22	7	6%	10%	26%	44%	14%
AF1	4	3	3	21	19	8%	6%	6%	42%	38%
AF2	5	6	12	12	15	10%	12%	24%	24%	30%
AF3	3	5	14	17	11	6%	10%	28%	34%	22%
AG1	4	3	3	21	19	8%	6%	6%	42%	38%
AG2	5	6	12	12	15	10%	12%	24%	24%	30%
AG3	3	5	14	17	11	6%	10%	28%	34%	22%

Awareness of frameworks is also showing majority responses between agreeing and neutral as mean values were 3.96, 3.52 and 3.56, respectively for AF1, AF2, and AF3. Outcomes are frequency analysis representing the fact that frequencies in AF1 were higher for agree criteria as it was amounting to 42%. Whereas, in AF2, Neutral and agree opinions have similar proportions of 24%. Strategy development showing the same results in AG1, AG2 and AG3, which highlights acceptance of research facts. Frequencies explored are showing a higher percentage for Agree response criteria in AG1. These responses were also more top in AG2 and AG3.

5.6 Quantitative analysis for Private sector

5.6.1 Descriptive Statistics and Frequency analysis

Descriptive Statistics							
		N	Minimum	Maximum	Mean	Std. Deviation	Variance
Land development	AA1-Private	50	1	5	3.38	1.24	1.55
	AA2-Private	50	1	5	3.58	1.36	1.84
	AA3-Private	50	1	5	4.00	1.20	1.43
Sustainable land development	AB1-Private	50	1	5	3.38	1.24	1.55
	AB2-Private	50	1	5	3.54	1.37	1.89
	AB3-Private	50	1	5	3.98	1.19	1.41

	Valid (listwise)	N	50					
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Land development descriptive mentioned in AA1, AA2 and AA3, where mean obtained were 3.38, 3.58 and 4.00. The results are predicting responses ranging between agreeing and neutral criteria. This shows that research facts are acceptable, and land development practices can play a potential role within Qatar as per the respondents of the private sector. In AA1, a higher proportion of responses are obtained from Neutral criteria, whereas in AB2 and AB3 highest frequency and percentage is about strongly agreed on answers as these were 32 % and 46% respectively.

	Proportion					Frequency of Responses				
	SD (1)	D (2)	N (3)	A (4)	SA (5)	SD (1)	D (2)	N (3)	A (4)	SA (5)
AA1						12%	6%	36%	24%	22%
AA2						10%	16%	12%	30%	32%
AA3						4%	12%	10%	28%	46%
AB1						12%	6%	36%	24%	22%
AB2						10%	18%	12%	28%	32%
AB3						4%	12%	10%	30%	44%

On the other hand, responses gained for Sustainable land development can be overviewed from parameters of AB1, AB2 and AB3; mean values obtained were between 3.38 and 3.98. Observations made are showing that responses are majorly between agree to neutral. This can also be observed using frequency analysis and comparative analysis provided in the above table, which shows a higher proportion of neutral responses in AB1 is amounting to almost 36%.

Descriptive Statistics							
		N	Minimum	Maximum	Mean	Std. Deviation	Variance
Current land-use practices	AC1-Private	50	1	5	3.44	1.28	1.64
	AC2-Private	50	1	5	3.58	1.36	1.84
	AC3-Private	50	1	5	4.00	1.20	1.43
Impact/benefits	AD1-Private	50	1	5	3.66	1.15	1.33
	AD2-Private	50	1	5	3.94	1.25	1.57

	AD3-Private	50	1	5	4.04	1.16	1.35
Challenges	AE1-Private	50	1	5	4.00	1.14	1.31
	AE2-Private	50	1	5	3.92	1.31	1.71
	AE3-Private	50	1	5	4.04	1.19	1.43
	Valid N (listwise)	50					

Descriptive statistics analysed above is interpreting Current land-use practices to mean in the private sector, which was amounting to 3.44, 3.58 and 4.00 for AC1, AC2 and AC3, respectively. In contrast, frequency analysis (refer to below table) is showing that higher frequency is obtained for Neutral responses in AC1. In contrast, other parameters have shown a majority in strongly agree and agree on with reactions. On the other hand, analysis regarding benefits and impact is showing positive mean values 3.66, 3.94 and 4.04, respectively. On the contrary, frequency analysis is highlighting that in the parameters, higher responses are gained for strongly agree in AD1, AD2 and AD3.

	Proportion					Frequency of Responses						
	SD (1)	D (2)	N (3)	A (4)	SA (5)	SD (1)	D (2)	N (3)	A (4)	SA (5)		
AC1		6	3	17	11	13		12%	6%	34%	22%	26%
AC2		5	8	6	15	16		10%	16%	12%	30%	32%
AC3		2	6	5	14	23		4%	12%	10%	28%	46%
AD1		3	4	14	15	14		6%	8%	28%	30%	28%
AD2		3	6	4	15	22		6%	12%	8%	30%	44%
AD3		2	5	5	15	23		4%	10%	10%	30%	46%
AE1		2	4	8	14	22		4%	8%	16%	28%	44%
AE2		3	7	5	11	24		6%	14%	10%	22%	48%
AE3		2	6	4	14	24		4%	12%	8%	28%	48%

	Proportion					Frequency of Responses				
	SD (1)	D (2)	N (3)	A (4)	SA (5)	SD (1)	D (2)	N (3)	A (4)	SA (5)
AA1	6	3	18	12	11	12%	6%	36%	24%	22%
AA2	5	8	6	15	16	10%	16%	12%	30%	32%
AA3	2	6	5	14	23	4%	12%	10%	28%	46%
AB1	6	3	18	12	11	12%	6%	36%	24%	22%

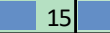
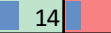
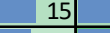
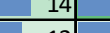
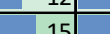
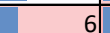
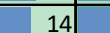
AB2	5	9	6	14	16	10%	18%	12%	28%	32%
AB3	2	6	5	15	22	4%	12%	10%	30%	44%
AC1	6	3	17	11	13	12%	6%	34%	22%	26%
AC2	5	8	6	15	16	10%	16%	12%	30%	32%
AC3	2	6	5	14	23	4%	12%	10%	28%	46%

Descriptive statistics interpreting results for AE1, AE2 and AE3 are showing mean values of 4.00, 3.92 and 4.04, which is showing higher opinions for strongly agree and agree in AE1 and AE3. Whereas, frequencies are showing a higher proportion of responses for strongly agree as these were amounting to 44%, 48% and 48% of total responses.

Descriptive Statistics							
		N	Minimum	Maximum	Mean	Std. Deviation	Variance
Awareness of frameworks	AF1-Private	50	1	5	3.66	1.15	1.33
	AF2-Private	50	1	5	3.58	1.36	1.84
	AF3-Private	50	1	5	4.00	1.20	1.43
Strategy Development	AG1-Private	50	1	5	3.38	1.24	1.55
	AG2-Private	50	1	5	3.58	1.36	1.84
	AG3-Private	50	1	5	4.00	1.20	1.43
	Valid N (listwise)	50					

Awareness of framework is showing mean for AF1, AF2 and AF3, which are 3.66, 3.58 and 4.00. This is demonstrating evidence for acceptance of research facts, whereas frequency analysis provided below is showing that frequency for Agree responses is higher amounting to 30%. Whereas AF2 and AF3 are showing a higher proportion of responses for strongly agree to amount to 32% and 46% respectively. Strategy development in AG1, AG2 and AG3 is showing mean values of 3.38, 3.58 and 4.00, respectively. These aspects are demonstrating facts for the acceptance of the importance of strategy development in land management. Frequencies and

comparative analysis is representing a higher proportion of Neutral responses in AG1 and strongly agree opinions were more top in AG2 and AG3.

	Proportion					Frequency of Responses				
	SD (1)	D (2)	N (3)	A (4)	SA (5)	SD (1)	D (2)	N (3)	A (4)	SA (5)
AF1	 3	 4	 14	 15	 14	6%	8%	28%	30%	28%
AF2	 5	 8	 6	 15	 16	10%	16%	12%	30%	32%
AF3	 2	 6	 5	 14	 23	4%	12%	10%	28%	46%
AG1	 6	 3	 18	 12	 11	12%	6%	36%	24%	22%
AG2	 5	 8	 6	 15	 16	10%	16%	12%	30%	32%
AG3	 2	 6	 5	 14	 23	4%	12%	10%	28%	46%

5.6.2 Correlation

The correlation analysis performed in below table is representing correlation analysis among different factors of Land development, Sustainable land development, Current land-use practices, Impact/ benefits, Challenges, Awareness of frameworks and Strategy Development. AB3 (sustainable land development) is an independent variable. As sustainability cannot be defined, every better from before technique of the usage of resources means that definition changes with the arousal of each performance. On the other hand, AC1, AC2 and AC3 are mirroring land-use practices are dependent on the description of sustainable land development. Since the two variables are related to Qatar substantially, ever since, benefits from land-use practices shall be affecting the society as a whole. Thus, AD1, AD2 and AD3 had been termed as independent too because their definition is also linked with sustainable land management. Therefore, types of practices adopted shall get better based on benefits felt in the prior period. Land development observed using AA1, AA2 and AA3 have a positive relationship with other factors except for AB3 and AC3 correlate -0.08 and -0.09, respectively. On the other hand AB1, AB2 and AB3 were having a negative association with AA1 and AC1 as correlation was -.118 and -.160 respectively. Whereas, AC1, AC2 and AC3 have a negative relationship with AA1 and AA3 as Pearson correlation were -.043 and -.084, respectively.

Correlations		AA1	AA2	AA3	AB1	AB2	AB3	AC1	AC2	AC3
AA1	Pearson Correlation	1	.184	-.043	.864**	.217*	-.118	.930**	.233*	-.043

	Sig. (2-tailed)		.067	.671	.000	.030	.244	.000	.020	.671
	N	100	100	100	100	100	100	100	100	100
AA2	Pearson Correlation	.184	1	.253*	.124	.784**	.210*	.190	.811**	.253*
	Sig. (2-tailed)	.067		.011	.220	.000	.036	.058	.000	.011
	N	100	100	100	100	100	100	100	100	100
AA3	Pearson Correlation	-.043	.253*	1	.018	.070	.866**	-.084	.052	1.000**
	Sig. (2-tailed)	.671	.011		.860	.486	.000	.403	.610	0.000
	N	100	100	100	100	100	100	100	100	100
AB1	Pearson Correlation	.864**	.124	.018	1	.101	-.057	.802**	.159	.018
	Sig. (2-tailed)	.000	.220	.860		.319	.572	.000	.113	.860
	N	100	100	100	100	100	100	100	100	100
AB2	Pearson Correlation	.217*	.784**	.070	.101	1	.205*	.203*	.807**	.070
	Sig. (2-tailed)	.030	.000	.486	.319		.040	.043	.000	.486
	N	100	100	100	100	100	100	100	100	100
AB3	Pearson Correlation	-.118	.210*	.866**	-.057	.205*	1	-.160	.052	.866**

	Sig. (2-tailed)	.244	.036	.000	.572	.040		.111	.605	.000
	N	100	100	100	100	100	100	100	100	100
AC1	Pearson Correlation	.930**	.190	-.084	.802**	.203*	-.160	1	.231*	-.084
	Sig. (2-tailed)	.000	.058	.403	.000	.043	.111		.021	.403
	N	100	100	100	100	100	100	100	100	100
AC2	Pearson Correlation	.233*	.811**	.052	.159	.807**	.052	.231*	1	.052
	Sig. (2-tailed)	.020	.000	.610	.113	.000	.605	.021		.610
	N	100	100	100	100	100	100	100	100	100
AC3	Pearson Correlation	-.043	.253*	1.000**	.018	.070	.866**	-.084	.052	1
	Sig. (2-tailed)	.671	.011	0.000	.860	.486	.000	.403	.610	
	N	100	100	100	100	100	100	100	100	100
**. Correlation is significant at the 0.01 level (2-tailed).										
*. Correlation is significant at the 0.05 level (2-tailed).										

Correlation Analysis is obtained below for factors of Current land-use practices, Impact/ benefits are useful to conclude how changes in one element can affect others. Here, Current land-use practices are undertaken as an independent variable and Impact/ benefits is used as a dependent factor. Here, AD1, AD2 and AD3 have shown a negative correlation with AE3 as Pearson was -.040. However, based on this fact, it cannot be demonstrated that factors of Current land-use

practices harm Impact/ benefits factor as only one parameter has shown negatively influence while others have determined positive association. This positive association can also be clarified by gaining evidence from frequency analysis.

Correlations		AD1	AD2	AD3	AE1	AE2	AE3
AD1	Pearson Correlation	1	.226 [*]	-.037	.607 ^{**}	.144	-.040
	Sig. (2-tailed)		.024	.715	.000	.153	.689
	N	100	100	100	100	100	100
AD2	Pearson Correlation	.226 [*]	1	.150	.158	.380 ^{**}	.137
	Sig. (2-tailed)	.024		.135	.116	.000	.176
	N	100	100	100	100	100	100
AD3	Pearson Correlation	-.037	.150	1	.066	.346 ^{**}	.839 ^{**}
	Sig. (2-tailed)	.715	.135		.514	.000	.000
	N	100	100	100	100	100	100
AE1	Pearson Correlation	.607 ^{**}	.158	.066	1	.307 ^{**}	.098
	Sig. (2-tailed)	.000	.116	.514		.002	.331
	N	100	100	100	100	100	100
AE2	Pearson Correlation	.144	.380 ^{**}	.346 ^{**}	.307 ^{**}	1	.369 ^{**}
	Sig. (2-tailed)	.153	.000	.000	.002		.000
	N	100	100	100	100	100	100
AE3	Pearson Correlation	-.040	.137	.839 ^{**}	.098	.369 ^{**}	1
	Sig. (2-tailed)	.689	.176	.000	.331	.000	
	N	100	100	100	100	100	100

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Another correlation analysis performed below is showing outcomes and relationships between two factors of Awareness of frameworks and Strategy Development. In this correlation analysis, Awareness of structure is considered as an independent variable, which can cause an influence on strategy development and can be regarded as a dependent variable of the study. Here, AF3 is having a negative relationship with AG1 as Pearson is -0.043. However, the majority in strongly agree on responses observed in the analysis is supportive of disclosing positive association among these.

Correlations		AF1	AF2	AF3	AG1	AG2	AG3
AF1	Pearson Correlation	1	0.158	0.013	.830**	0.158	0.013
	Sig. (2-tailed)		0.117	0.896	0	0.117	0.896
	N	100	100	100	100	100	100
AF2	Pearson Correlation	0.158	1	.253*	0.184	1.000**	.253*
	Sig. (2-tailed)	0.117		0.011	0.067	0	0.011
	N	100	100	100	100	100	100
AF3	Pearson Correlation	0.013	.253*	1	-0.043	.253*	1.000**
	Sig. (2-tailed)	0.896	0.011		0.671	0.011	0
	N	100	100	100	100	100	100
AG1	Pearson Correlation	.830**	0.184	-0.043	1	0.184	-0.043
	Sig. (2-tailed)	0	0.067	0.671		0.067	0.671
	N	100	100	100	100	100	100
AG2	Pearson Correlation	0.158	1.000**	.253*	0.184	1	.253*

	Sig. (2-tailed)	0.117	0	0.011	0.067		0.011
	N	100	100	100	100	100	100
AG3	Pearson Correlation	0.013	.253*	1.000**	-0.043	.253*	1
	Sig. (2-tailed)	0.896	0.011	0	0.671	0.011	
	N	100	100	100	100	100	100
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							

5.7 Qualitative analysis

The analysis gathered data for research by performing content analysis; the technique that converts raw data in the form of responses made to an interview question. By researching the context and themes in which these responses had been made, identification and matching of similar words. Coding themes are also designed in the research based on responses interpreted by each participant to conclude what are their significant opinions. The procedure used in each reaction is observed, and points are made in two to three words so that coding shows concise responses of participants.

5.7.1 Improvement in land utilisation initiatives in Qatar

The interview analysis of the first question regarding room for improvements needed in land utilisation initiatives and Respondent 3, 5, 7, 8 highlighted opinions that enhancements are necessary for land utilisation. Whereas, respondent 1 delivered, “Yes, there is room for improvement by opening more land for development. Regular Investors should be able, for example, to buy from government property for commercial or private use”. On the other hand, respondent 2 depicted, “The largest in building the country's economy, in partnership with the sector. The year to reach the goals of Qatar National Vision 2030”.

In contrast, participant 4 conveyed, “It is considered one of the best in the region, in the future we would like to see more options like flats or ready-built houses”. Respondent 6 illustrated, “Yes, sure here can make more developments. Agriculture improvement is a key factor”. Whereas,

remaining 11 to 16th respondents have highlighted improvements should be made in commercial, residential and office use.

To glean into feelings of public on sample basis about efforts by the government being made to aid in improving land usage, responses were gathered from additional six people using the questions that were put to 16 people earlier. Respondent number 17th, the first among these new ones is of opinion "Land is used by the residents of Qatar and though they bought it from the government and now can do whatever they want. However, Land is a limited natural resource, and it is already suffering damage from climate change due to rapidly expanding economic activity. This damage shall not only harm these land users; however, it shall be affecting the future of Qatar. Government is the custodian of the state of Qatar must interfere to ensure that a select group of Qatar does not harm the future of the entire Qatari society. He also stressed that in every country, people could not just buy Land of the government and start conducting activity on it. They had to get approval on an annual basis from the government, who has the full power to take back the possession of the Land if it feels that the Land is not being used what it was bought for."

Respondent number 18th answered, "Amid rising population, it is vital that Qatar's land usage is managed toward economic enhancement through the arrival of considerable technical skills in the form of foreign people". The response somewhat supports the findings made by Shandas, Makido and Ferwati (2017), who concluded that foreign people are better skilled from the local workforce. They can add to Qatar's economic activity by applying their skills most positively. However, the manner had better be controlled through government interference. The interference can be in any form, from land-use related policies to annual inspection-based license for continuing with activity required to imbue fear into people. Other four respondents were of a similar opinion, only took the matter ahead by suggesting that the government should also impose penalties for using Land against the activity mentioned in-laws.

<u>Coding Analysis</u>	<u>Coding theme (Summary of interview responses).</u>
<i>1. Room for improvement by opening more land for development.</i>	• IMPROVEMENT WINDOWS

2. *Regular Investors should buy land from government property for commercial or private use*
3. *Land initiatives can play a significant role in building the country's economy, and further goals can be achieved through Qatar National Vision 2030.*
4. *In future, improvements can be in terms of more options like flats or ready-built houses.*
5. *Agriculture improvement is a crucial factor.*

- **LAND INITIATIVES**
- **AGRICULTURAL IMPROVEMENTS**

5.7.2 Diverse aspects of land utilisation frameworks

In the second interview question for the identification of diverse aspects of land utilisation framework, were two respondent explained that religious practising places are more in contrast with commercial facilities. A similar response was gained from respondent four who highlighted, “Right now, the main aspect of land utilisation is providing accommodation areas for citizens meanwhile the municipality is completing the strategic plan of development such as commercial and utility aspect”. Respondent 1 highlighted, “Putting a strategy addressing the ever-rising prices of the land”. As per respondent 2, “Modern approaches to land use planning to define usesConvenience”. Respondent 3 depicted, “Residential lands, Service lands, such as hospital schools and the lands of public goods as well as gardens”. According to respondent 5, “All the land utilisation aspects in one umbrella format is better to categorize and adapt easily. For example, Mosque is the place where people gathering area but unfortunately most of the religious practising place there are no commercial facilities”. Respondent 6 highlighted, “all the land utilisation sects in the country developing now”. Respondent 8 depicted, “This framework integrates three dimensions including input intensity, output intensity, and the associated system-level impacts of land-based production”. 2 respondents have not responded in compliance with an interview question. Therefore, their responses are not valid to add in the analysis. Other respondents highlighted that it is over utilised.

Respondent 22nd was of the view that "A framework is a strategy, a tactic that allows the applier to bring improvements to an area from before. In Qatar, things are different because the country is small and has a harsh environment that is affecting Land. Moreover, the government is already

late in this regard. Thus, interference of the government in the form of the framework could aid the country in managing its economic activity." Respondent number 19th and 20th added, "A framework is a law that can be used to control, impose, direct and channel toward a course that is accepted as correct by the masses. With such a framework, the Qatari government can control the damaging activity being conducted on Land that is threatening the nearby pieces of Land. On the other hand, this law can also control prices of property careering out of control of the Qatari masses, thereby goading the farmers to sell their pieces of Land to constructors."

Respondents number 17th and 18th added that the issues are serious "Farmers are not able to earn returns as early as some other technical, economic activity promises. However, agricultural activity is also key for sustaining the health of the people of Qatar in the long-term. With regular check and balance on the activities being conducted on pieces of Land, the Qatari government can control the creation of this misbalance and avoid food shortage in the future." Respondent number 16 added that "Production being achieved by a farming land could also be controlled through this framework. They were comparing the current production on a land with the international standard expected based on the use of the level of technology or agricultural aids. It could be ensured that a piece of agricultural Land is supporting to the Qatari economy as best as it should, thus, brewing toward efficient usage of Land". These responses are meaningful and match with the conclusions arrived at in the research conducted by Nair (2014). The author concluded that the framework related to fair and efficient agricultural land usage could aid sustainable economic activity in Qatar in the long-term.

<u>Coding Analysis</u>	<u>Coding theme (Summary of interview responses).</u>
<i>1. Residential, Service lands including hospitals, schools and the areas of public goods as well as gardens.</i> <i>2. Unfortunately most of the religious practising place there is no or limited commercial facilities.</i> <i>3. Three dimensions, including input and output intensity as well as system-level impacts of land-based production.</i>	• ACCOMMODATION AREAS • LIMITED COMMERCIAL FACILITIES

4. Accommodation areas for citizens; meanwhile, the municipality is completing the strategic plan of development such as commercial and utility aspects.

5.7.3 Suggesting a comprehensive strategic framework

In the third interview question, respondents have highlighted considerations, which should be focused while suggesting a comprehensive strategic framework for sustainable land use. Respondent 1 illustrated, “Push for utilisation of sustainable building codes such as GSAS by developers”. Respondent 4 elaborated, “We would like to see some cooperation between citizens and the municipality to push the development wheel faster in the future”. Similar opinions were demonstrated by respondent 2 and 3. Respondent 5 highlighted, “Because of sustainable development, land use planning is seen as a political and technical-administrative decision-making process agreed with social, economic, political and technical factors, for orderly occupation and sustainable use of the land under development”. Participant 7 highlighted, “Sufficient width of road networks, passageway, road crossing bridges. In every commercial building, there should be sufficient parking”. A similar type of opinion was shown by respondent 6. Respondent 8 depicted, “Is an essential condition for improved environmental management including source/ sink functions for greenhouse gasses, recycling of nutrients, Amelior action and filtering of pollutants and transmission and purification of waster as per of the hydrologic cycle”.

Respondent number 21st and 22nd gave a satisfying answer "Strategy is a formula for creating a path forward around threats possibly faced in the future, while also trying to create a channel for gaining benefits. Thus, to attain sustainable land usage, the government must ensure every year that land users are conducting activities on the Land that are permitted under Qatar law. Furthermore, it must also make sure that the land user must create numerical figures related to the ecological effect of activity on the Land as well as air; these figures must be maintained year by year. The simple measure would allow the government to perform a similar test, which either corroborates these figures or negate them. Based on the test results, the landowner could be penalised or even given an award for performing economic activity confined within laws."

Respondent numbers 17th added, "The only different and more interesting part was a suggestion about making improvements agricultural produces being achieved on a certain piece of Land. These people are of the view that the purpose here is to prolong the productivity of the Land.

Therefore, the government should access the fertility of the Land at the time it is being inspected. The scrutiny should give an idea of whether or not the use of a chemical to maintain the harvest is not hurting the fertility of the Land". Respondent number 19th "Made interesting views, they believed that to respond to social change going on in Qatar pulled by the rise in population. The government should first control the rapid urbanisation by awarding pieces of Land to the constructors who should be asked to develop sustainable and smart societies. These societies should generate the smallest burden on the national grid, usage of natural resources as well as chugging out of harmful ecology killers into overall Qatari society. The measure is quickly implementable as well as could provide short-term benefits with long-term impacts in the shortest time."

<u>Coding Analysis</u>	<u>Coding theme (Summary of interview responses).</u>
<i>1. The utilisation of sustainable building codes such as GSAS by developers.</i> <i>2. Cooperation between citizens and the municipality</i> <i>3. Land use planning as a political and technical-administrative decision-making process, which should be in line with social, economic, political and technical factors. This increases an orderly occupation and sustainable land use.</i> <i>4. Road networks, passageway, road crossing bridges should have sufficient width</i> <i>5. Sufficient parking in commercial buildings</i> <i>6. Functions for greenhouse gases, recycling of nutrients, and filtration of pollutants as well as transmission and purification of water through the hydrologic cycle</i>	• SUSTAINABLE CODES • PESTEL FACTORS • PARKING FACILITY • GREENHOUSE GASES

5.7.4 Benefits and impact of sustainable land use

In interview question 4, benefits and impact of sustainable land use are explored. In this instance, Respondent 1 demonstrated, "Positive impacts, especially in the long run". Whereas, respondent 2 highlighted, "Land resource use planning, others; good governance and analysis of trade-offs between uses to enable development. Effective and implement land use plans that improve use.

Resources and reduce conflicts between competing users. Keep Resources for future generations”. Respondent 4 highlighted, “To expand the urban area in the country and reduce the pressure of the major cities”.

In contrast, respondent 5 depicted, “As the most important natural resource, sustainable use of the land resource is the essential guarantee of sustainable development. The nature of the sustainable use of the land resource is to retain the quantity and productivity of land resource from generation to generation”. Respondent 7 and 8 have shown similar opinions of Economic and social opportunities for the benefit of future generations as well as avoiding unnecessary waste of land. Whereas, remaining respondents have shown non-responses or their opinions are not valid.

Of all the questions, this generated the most interesting responses and was also responded upon by all the new participants. The question’s essentialness is also visible from the researches gathered for supporting literature review. Shandas, Makido and Ferwati (2017) concluded that the Land is the essential natural resource that could not be replicated at all, being already significantly less as a feature of this globe. It is also quickly deteriorating by natural causes such as floods, waterlogging and salinity. Thus respondents too had several useful suggestions in this relationship between Land and sustainability of Qatar. Number 17th respondent supplied that, "The greenest and fertile piece of land in Qatar must not be used for industrial activity no matter whether the company is doing a highly controlled business or even it is green. Eventually, such commotion causes seismic disturbances to the structure of Land, which in return would drastically change the level of fertility. Therefore, by conducting many cheques on the productivity of Land, it would be revealed that a particular piece of land would become worthless in a short to mid-term period. Thus, this framework is allowing the government to sustain the economic activity through rapidly deteriorating Land being used for commercial business”.

Respondent number 18th responded "Agricultural activity cannot be done on a waterlogged piece of Land; however, such Land could be used for residential purpose after making few embellishments to it. Since Qatari society shall thrive if it can get access to cheaper basic food in the long-term; therefore; it is more prudent if the fertile piece of land is used to conduct the agricultural activity. Furthermore, it is also essential that Land is kept for community services such as health and re-creation. Allocation of Land for doing such activity is not considered profitable. Still, it can drastically affect the life of Qatar's society in the long-term and even effecting their

productivity in short-term”. Respondent number 19th also added that "Healthy society can contribute to Qatar's vision of 2030 by working effectively and efficiently. This efficiency cannot be achieved if the workers are not feeling healthy to be able to perform the duties; this shall increase the cost of their work to Qatar's society as a whole. As they are relying on other natural resources to perform their work and if resource cost is not generating any export orders rather, just adding to the cost of the economy as a whole. Then it is a loss to the Qatar economy; therefore, not only hospitals but also recreational areas must be allocated pieces of Land." Respondents' number 20th, 21st and 22nd also added more or less to the above two detailed responses.

<u>Coding Analysis</u>	<u>Coding theme (Summary of interview responses).</u>
1. Sustainable land use creates positively impact 2. Good governance, analysis of trade-offs. Reduce conflicts between competing users ensures resource availability for future generations. 3. Expansion of urban area and reducing pressure on major cities 4. Sustainable use benefits in retaining the quantity and productivity of land resource from generation to generation	• CONFLICTS MANAGEMENT • EXPANSION • SUSTAINABILITY

5.7.5 Successful implementation of current land-use practices in Qatar

In the accumulation of data from the 5th interview question, the role of the public sector in Qatar witnessing the successful implementation of current land-use practices is identified. Respondent 1 and 3, in this regard, delivered that they are hoping for a drastic change. Respondent 2 furthered their voice, “Clear roles and responsibilities in the implementation of programs and projects to be a basis for financing and a basis for activities and a platform Accountable. Without this clarity, activities mix and overlap responsibilities, they are weakening the outcome of the strategy and what we achieve from plans, programs and projects”. Respondent 4 depicted, “They are

welcoming the new initiatives' but complaining about the long time it takes". Respondent 5 demonstrated, "Current land-use practices help the public sector in various ways. Infrastructure development to connect all over Qatar is a significant change achieved by the current situation.

Agriculture zone and Industrial zone made a challenging move to Public sector achievements, Roads, Stadiums, Parks, Governmental and Non-Governmental Institutions are also erect a significant change in the face of Qatar from previous, and it symbolises Qatar headed a sustainable urban development. It is because of the wise implementation of current land-use. The ultimate result of the current application progressively helps tourism of Qatar. However, the effective NDS implementation will continue to be subject to a critical practice when it comes to empowering the public-sector performance. Urban transport infrastructure, implementing a national land-use plan smoothly". Participant 7 depicted, "They were more vigilant to implement wise administration of land-use practices in Qatar. Nowadays, the public sector improves faster, so they know to watch more significant method of land-use practices in Qatar". Respondent 8 mentioned, "Qatar's society, Qatar's cultural and religious values, as well as the needs of future generations covering all aspects of social, economic and environmental activity". Other respondents said that successful implementation could be done by studying the market.

Respondent number 22nd about the successful implementation of land-use practices being important for Qatar had to respond succinctly. According to him, "Qatar is a growing economic hub, it being home to one of the largest oil and gas extraction and refineries companies in the world. Is also eventually supporting global economic activity, since, the global economy is resting its shoulders partly on Qatar; therefore; it concentrates its human resources towards Qatar as well. These people are better qualified from local Qatari population, however, would thrive and add to Qatar's economy, if they are given a chance to make use of their skills. These skills involve increasing productivity of agricultural Land, employing greener methods of production into manufacturing facilities. Furthermore, recycle most of the industrial waste in a less risky manner, construct buildings that are energy efficient because they use environmentally friendly materials as well as rely on self-generated energy".

Respondent number 19 took matter differently and showed, "This was to lay the most well-planned mass-transit network that would allow the government of Qatar to allocate less Land for laying road network. The idea being that rail tracks take a separate piece of Land, and if that piece is not

efficient because people still have to use their cars to reach their destination, then it is not mirroring efficiency. Thus, the government of Qatar should plan the new societies which are connected effectively together by rail on the surface or underground.” Interestingly, respondent number 18th added that "Climate change is affecting Land; this climate change is being largely caused by transport plying Qatar's roads. Thus, if one form of it is first reduced and then eventually phased out, it could aid the government to reduce the carbon footprint. Thus, reducing the overall ecological change, Qatar is going through".

<u>Coding Analysis</u>	<u>Coding theme (Summary of interview responses).</u>
1. Clarification of roles and responsibilities in the implementation of programs and projects. 2. Without this, activities can mix or overlap, which can create weaknesses in the accomplishment of outcomes. 3. They are welcoming the new initiatives' but complaining about the long time it takes 4. Infrastructure development to connect all over Qatar. 5. Agriculture and Industrial zone made a challenging move to Public sector achievements as different Parks, Stadiums, Roads, Governmental and Non-Governmental Institutions. 6. These institutions are influential in symbolizing that Qatar headed sustainable urban development and successful land-use practices. 7. The current implementation helps in progressing the tourism of Qatar. 8. However, the effective NDS implementation can be significant to empower public-sector performance improvements can be evidenced in urban transport infrastructure as well as the implementation of national land-use plan smoothly.	• SPECIFICATION OF RULES AND REGULATION • INFRASTRUCTURAL DEVELOPMENT • NDS IMPLEMENTATION • STRONG ADMINISTRATION • IMPORTANCE OF VALUES

- | | |
|--|--|
| <p>9. <i>Implementation of wise administration of land-use practices in Qatar.</i></p> <p>10. <i>Qatar's society, cultural and religious values must be covered in social, economic and environmental activities along with the needs of future generations.</i></p> | |
|--|--|

5.7.6 Land reforms in Qatari Public Sector impacting the investment potentials

In the 6th interview question, land reforms in Qatari Public Sector and their resulting impact in investment potentials are evaluated. Respondent 1 and 3 have shown similar opinions regarding hopefulness to get a reduction in prices. Respondent 2 depicted, “Modernisation, maintenance of traditions, realisation. The balance between the needs of the current and future generations, and control the targeted economic growth and avoid expansion. Uncontrolled, congruence between the size and quality of expatriate labour, the target development path, and the alignment of development. Economic, social development and environmental protection”. Respondent 4 demonstrated, “Agriculture, healthcare as well as social protection and employment opportunities in prosperous, Possible pathways to public sector institutional development During the past years total gross domestic investment inputs, focus on the results to be achieved by Public Sector Companies”. Respondent 8 demonstrated, “Public investment program is putting the brakes on the domestic economy”.

As per respondent number 17th, "Foreign direct investment entering into Qatar rests on the government's ease of allowing the conducting of economic activity by the foreign-owned multinational corporations. Land reforms are also part of such policy, and by the ease, it means that the government does not bombard the activity with a stack of documents required during registration. Rather, these policies should be clear about the type of economic activity allowed to be performed on a certain type of piece of Land. This shall make it easier for the organisations in chalking out a path that will aid them in supporting Qatar's economy in the long-term." Respondent number 18th showed that "Entry of foreign direct investment in the country can give the government a chance to focus on performing strategic objectives required to manage the Qatar economy as a whole. Bringing into the country technically advanced blood would allow efficient

land usage being taken to a higher level, thereby using a small amount of it for generating higher output". Similar opinions were offered by other research participants.

<u>Coding Analysis</u>	<u>Coding theme (Summary of interview responses).</u>
1. Modernisation, maintenance of traditions, realisation in land reforms. Balance land reforms for the needs of current and future generations, along with avoiding expansion. 2. Congruence between size and quality of expatriate labour, the target development path, and the alignment of development. 3. Focus on the results to be achieved by Public Sector Companies 4. The public investment program is putting the brakes on the domestic economy	• SIZE AND QUALITY CONGRUENCE • PUBLIC INVESTMENT PROGRAM

5.7.7 Land reforms in Qatar

In the 7th interview question, land reforms in Qatar and their potential impact on the economy is explored. Participant 1 depicted, "In general positive impact by the overall reduction in development costs leading to a reduction in rentals". As per respondent 2, "Achieving sustainable and balanced growth to consolidate important values, including the value in exchange for the cost through the responsible use of oil and human resources, and the development and modernisation of government institutions to ensure efficient performance". According to participant 3, "In general positive impact by an overall reduction in development costs leading to a reduction in rents". Respondent 5 demonstrated, "Land reforms in Qatar need a more practical and technical way to achieve maximum output. Right now, the land reforms in a true way but want to improve more and definitely; there is a good impact on these reforms on the economic side in Qatar". Respondent 8 mentioned, "Importance of expanding the use of modern technology reducing corporate registration procedures, reducing the time used for audits and stimulating the business sector in line with developments".

According to respondents 17, "Land reforms in Qatar being done had brought stability to the property market. Prices of the property to a great extent had been controlled as well as the rent

being charged from the tenants had gone down. This is good; however, land reforms are more than just making sure that the masses get to live under the roof, surely that that roof is not going to do good when the health of the society deteriorates due to food shortage. These troubles could be avoided through reforming Land related rules to aid the happening of the agricultural activity in the long-term." Similar responses were showed by 18th, 19th, 20th and 21st respondents. Respondent number 22nd was also of the detailed view "Land reforms ought to control the emissions being emitted from the economic activity being conducted unchecked across the swathes of Qatar. The activity is also cutting off trees and acquiring the Land, which in return is affecting the ecology of Qatar in the long-term. Furthermore, this eradication of the forest is also hampering the nourishment of the natural eco-system as well as non-human beings essential for the sustaining the survival of human being in the middle of natural threats."

<u>Coding Analysis</u>	<u>Coding theme (Summary of interview responses).</u>
<i>1. Reduction in development costs can positively affect or create a reduction in rentals.</i> <i>2. Responsible use of oil and human resources can affect the development and modernisation of government institutions to ensure their efficiency.</i> <i>3. Reforms should be practical and technical so that maximum output can be achieved.</i> <i>4. These reforms can play a significant role in enhancing the economic output of the region.</i> <i>5. Reducing corporate registration procedures, use of modern technology, reducing timespan requires in audits and stimulating the business sector in line with developments.</i>	• DEVELOPMENT COST • MODERN TECHNOLOGY • AUDITING OF THE SECTOR

5.7.8 Recommendations for a successful strategic framework

In this section, recommendations are obtained, and these are useful and might eventually become research recommendations. With the aid of these recommendations, in chapter six discussion is the light of literature is done to observe whether these recommendations can be utilised as practical

implications or not. The debate shall enable the reader to conclude about their practicality within already researched work.^{8th} Interview question is significant to accommodate recommendations for successful strategic framework assuring optimum use of land in the public sector of Qatar. Respondent 1 and 3 have shown similar respondent of Opening more areas for investments . Respondent 2 highlighted, “The National Development Strategy seeks to achieve a steady rise in the Qatari economy, but with care to curb the uncontrolled growth, and to protect the environment, in a manner that guarantees the preservation of the land, water and air of Qatar for future generations”. Respondent 4 depicted, “Need to be common planning between public and government sector” Respondent 5 demonstrated, “Agriculture Infrastructure and recreation are the three major land use to be taken as a prime consideration. However, currently, there is a sustainable infrastructure development achieved by World Cup 2022. Qatar tourism can be booming for the next few years so the overall development could be reached more specific figure”. Respondent 8 illustrated, “Land regulations should ensure that housing construction can keep pace with population growth”.

According to respondent 20, “Factors, which should be considered most importantly, are greenhouse gasses, recycling of nutrients, and filtration of pollutants as well as transmission and purification of water through the hydrologic cycle. Benefits can be in terms of resource availability for future generations, Good governance. Successful implementation can be made possible with clarified roles and responsibilities, wise administration”. Similar responses were offered by other participants. Impact on investment is that it can be considered as an engine of the domestic economy. Reduction in development cost can also minimise rentals, responsible use of oil and human resources. Recommendations provided by respondents should include that more land should be opened up for investment and preservation of the area, water and air of Qatar for future generations should be targeted to achieve sustainability.

<u>Coding Analysis</u>	<u>Coding theme (Summary of interview responses).</u>
<i>We are opening more lands for investments.</i> <i>National Development Strategy should create a steady rise in the Qatari economy, protect the environment, and create</i>	NATIONAL DEVELOPMENT STRATEGY

<i>preservation of the land, water and air of Qatar for future generations.</i> <i>3. Common Plans should be developed for the public and government sector.</i> <i>4. Agriculture, Infrastructure and recreation should be taken into prime consideration.</i> <i>5. Sustainable infrastructure development for World Cup 2022 can also be vital as it can boom sustainability over the next few years.</i> <i>6. Reforms must ensure that housing construction can keep pace with population growth.</i>	• SUSTAINABLE INFRASTRUCTURE • BETTER REFORMS
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5.7.9 Awareness of optimum use of land mainly in Qatar public sector

In interview question 9, evaluation performed is targeted to determine whether there is an awareness of optimum use of land, particularly in Qatar public sector and what strategic plans and policies are used for land development. Two respondents revealed that there is no awareness. Whereas, respondent 2 highlighted, “Efficient use of natural resources, including (oil, energy, and water). They were continuously updating and developing legislation to keep pace with various developments. Maximise the true partnership between the public and private sectors. Focus on raising the efficiency of skilled workers in the Qatari labour market”. Respondent 4 depicted, “The awareness of the public sector should be updated faster to keep up with the overall plan of development”. Respondent 5 demonstrated the fact, “Strategy refers to the determination of the long-term objectives of an enterprise and the adoption of courses of action to achieve these aims, while policies are concepts that guide the thought processes and behaviour of managers when they make decisions. Optimum use of land is essential for both private and public sector development”. As per respondent 8, “Land use is a key policy area that can further economic environmental and social goals. Planning and regulation restrict how the land can be used”.

Respondent number 17th supplied that, "Public at large of Qatar is aware of the implications of the non-optimal land usage. This is good because any kind of government law must be supportable by the public to be implemented into their lives and the economy in return feeling the effects of it.

This means that whatever level reforms are brought in Qatar, the public at large is going to support it and therefore, the government can work on in piece toward sustaining the future development of Qatar". Other respondents also displayed positive remarks about the Qatari public being aware of the impacts of these land reforms on the future of Qatar.

<u>Coding Analysis</u>	<u>Coding theme</u> <u>(Summary of interview responses).</u>
1. No awareness. 2. Natural resources should be efficiently used, including oil, energy, and water. 3. They are continuously updating and development of legislation to cater to the event. Partnerships between the public and private sectors as well as focusing on raising the efficiency of skilled workers. 4. Strategies determine long-term objectives, which caters the achievement of aims. Whereas, policies provide guidance regarding processes and behaviour of managers. 5. Optimum use of land in private and public sector development is essential. 6. Land use is a key policy area that can improve economic, environmental and social goals. 7. Planning and regulation can restrict land use.	• STRONG AWARENESS • OPTIMUM USE • STRICT PLANNING REQUIRED

5.7.10 Policies and regulatory issues you face in land development

Interview question 10 is raised regarding the development of strategies for land and how the influence of their use can affect economic growth and what policies and regulatory issues you face in land development. Respondent 1 said, "It could lead to a reduction in overall development investment which leads to a reduction in rentals. Such a reduction would be then reflected on commodities and services prices". Respondent 2 depicted, "The methodology for managing the performance of the second national development strategy (2018-2022) is to be reviewed through dashboards are reported at various levels) of the national strategy- the level of the strategic sector

- the level of the relevant ministry). The periodicity of measuring these indicators will be annual, half annually, quarterly - and maybe monthly - to measure progress on key strategic projects". Respondent 3 highlighted, "It could lead to a reduction in overall development investment which leads to a reduction in rentals, such as reduction would be more than reflected on commodities and services prices". Respondent 5 demonstrated, "Strategic land use and Economic growth are correlated. Transparent way of strategic land use improves economic growth. Policies and regulatory issues need tremendous responsibilities to ensure the problem". Participant 8 elaborated, "Misguided incentives can cause local governments to pursue planning policies that raise housing cost and suburban sprawl". Other respondents said that this is possible under strict supervision from authorities.

Respondent number 20th supported, "Those policies also mean that the government-controlled entities, as well as departments as a whole, are generating toward the economic activity of Qatar. Admittedly, departments can hardly generate additionally under any form to the economy of Qatar, the government. However, it can ensure that the energy being used in these departments, as well as, other resources such as fuel for transport, gas or any other form of activity being performed in these departments. That raise ecological change in the atmosphere of Qatar could be controlled. Control could be in the form of the department requiring to publish monthly usage of natural resources and even doing surprise checks through the team, including impartial members of the society. This would ensure that the government department is not using the becoming part of the deterioration of Land in the form of excessive resource usage or generation of pollution". Respondent number 22nd took another view "land reforms should also include an examination of the entire Land of Qatar being measured against values that had been agreed by all the members of the society. The yearly measurement would allow the Qatari government to know whether land reforms being initiated are taking Qatar toward a better or worse from now future. This is essential because initiation of a plan is easy; however, measuring it and then refining it is far more important than creating the land reforms".

Coding Analysis

Coding theme (Summary of
interview responses).

1. <i>These issues can affect overall development in investment, which can reduce rentals. This reduction can be reflected in commodities and services prices.</i> 2. <i>Methodology for managing the performance of the second national development strategy of (2018-2022).</i> 3. <i>National strategy - strategic sector-level of the relevant ministry can affect economic growth.</i> 4. <i>Periodic measurements of these indicators will be based on annual, half annually, quarterly, maybe monthly, which can enable the measurement of progress related to key strategic projects.</i> 5. <i>Economic growth is correlated with Strategic land use. Strategic land use transparency can enable enhancement in economic growth.</i>	• REDUCTION IN RENTALS • PERIODIC MEASUREMENT • TRANSPARENCY LEVEL
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5.8 Chapter summary

The facts they have accepted in AA1, AA2 and AA3 show that regulatory authorities must have adequate land development planning. Another aspect is that better governance of the land development sector is essential for government and regulatory authorities. Moreover, policies and procedures related to land development can enable practical and sustainable land development. In response, AB1, AB2, and AB3 respondents concluded that Sustainable land development practices lead to addressing environmental issues as well as it could improve social and cultural values. Moreover, these practices lead to productive land and non-land based productions.

From AC1, AC2 and AC3, the facts analysed through this parameter are showing that current land-use practices are sufficiently addressing the environmental issues. Along with these social and cultural values can also be sent, whereas, these practices adequately address the land and non-land based productions. The fact interpreted based on AE1, AE2, and AE3 are that increasing urbanisation is a challenging aspect related to inappropriate use of land. On the other hand, in AE1, AE2 and AE3 mean values are showing values lies between neutral and agree on response criteria, which concludes that Increasing human habitation results in the deterioration of sustainable land-

use practices, whereas, uncontrolled economic and population growth lead to challenging land-use practices.

The findings concluded based on this is showing that environmental institution could play an essential role in increasing awareness related to optimum use of land and Framework is essential to focus on leading awareness campaigns for strict implementation of land-use policies, whereas, public awareness related to land use frameworks could result in mitigating the land use risks. Strategy development showing similar results in AG1, AG2 and AG3, which highlights acceptance of research facts. Findings show that the research hypothesis can be accepted, as there is an impact between the independent and dependent variable of the research.

It has been evidenced in the qualitative analysis that Regular Investors should buy land from government property for commercial or private use as well as agricultural activities should be further enhanced. Moreover, flats and ready to build houses should also be improved. Diversity can be in terms of opening Residential, Service lands including hospitals, schools and the areas of public goods as well as gardens. Religious places are more in contrast with commercial facilities. Consideration should be made for building codes such as GSAS by developers, political and technical-administrative decision-making process, orderly occupation and sustainable land use.

In this section, it was summed that government interference had always supported the economy groom to a higher level. Because regular checks by the government on the implementation of these policies, frequent measurement of their effects and consensus on the matter with the public can groom the economy as a whole, undoubtedly, the process is long-term and thus, might need patience for the results to materialise; however, the results are long-lasting as all the stakeholders are agreed on the matter. This finding in the literature section is also supported by the performance of the quantitative analysis correlation analysis among different factors of Land development, Sustainable land development, Current land-use practices, Impact/ benefits, Challenges, Awareness of frameworks and Strategy Development. Land development observed using AA1, AA2 and AA3 have a positive relationship with other factors except for AB3 and AC3 correlate - 0.08 and -0.09, respectively.

On the other hand AB1, AB2 and AB3 were having a negative relationship with AA1 and AC1 as the association was -.118 and -.160 respectively. Furthermore, AC1, AC2 and AC3 have a negative association with AA1 and AA3 as Pearson correlation were -.043 and -.084, respectively. These

findings put together with the responses to the interview containing ten questions reveal that Qatari public wants the government of Qatar to play a more mature role through devolution and active application of Land related policies.

Chapter 6: Discussion of the Findings

6.1 Introduction

The central focus of the current research is to explore strategic framework development for optimum land utilisation in the Qatari public sector. According to the findings of the study, there is a need for improvement in Qatari Land development strategies and new policies should be implemented. Land-use policies and land use planning are interrelated with each other as Acheampong and Silva (2015) said that land-use systems are based on the plan, which is a process of resource allocation to provide the benefits to all layers of an urban society adequately. Furthermore, Affolderbach and Carr (2016) said that land planning is a tool for the implementation of policies. Further, it provides a direction for the decision making of both government and private sectors. In addition to this, the research also identified that to develop the best land consumption policy; companies required proper planning refers to a process and preparation of strategies. The plan for the development of systems is so necessary for the division of land which fulfils the social and economic needs of society as well as securing resources for the future (Hamdouch et al., 2016).

6.2 Discussion in the Light of literature

The results steered in this research are revealing that better land usage could not only take the economy of Qatar to a much higher level but this careful and well-planned usage of land. This could also support the economy of Qatar in the long-term as the country is sea-locked and therefore should use this non-imitable natural resource carefully. This careful usage of land could be achieved through the devolution of policies related to sustainable land usage UAE. The policy is the way of controlling both private as well as public factors doing land-related activities in Qatar, and the stakeholder examination reveals that different groups are demanding planning of such policies. These responses collected from a sample of such stakeholders have been included in chapter five, the sample consists of 65 people who hold an educational degree at or higher from bachelor level, and 48 of them are employed at a managerial or higher level. While 51 people from the total sample of 100 approximately had been related to land management in their career, and they all agree with the cause of sustainable land management.

Furthermore, support to sustainable land development is depicted by AB2 and AB3, as a response to this duo fall between neutral and agree. While, answers for AB1 and AB2 fall on strongly agree with level, even, levelling unto 56% and 50%. While, in AA3 solutions, given by 32% of

respondents, were falling on agreeing to level. These responses had been gathered through employees involved in public departments as well as private sector people, showing a consensus to the call for these policies.

6.3 Theme 1, Objective 1: Frameworks for land use for sustainable development.

When it comes to objective 1, this is focused on the critical evaluation of frameworks for land use and sustainable development. The findings for this objective were uncovered in the qualitative data. From the qualitative analysis, it has been evidenced that Regular Investors should buy land from government property for agricultural activities as well as commercial or private use, which should be further enhanced. Ozasa, Grant, and Kdama (2018) said that Japan used conservation measures after the incident of Hiroshima and Nagasaki to keep natural resources and invest in getting new resources. These investments played a vital role in transforming the environmental challenges and effective land utilisation. With the area closure strategy, the fertility of land enhanced to some level; however, there are still some sustainable practices that are needed to meet the current demand of the society. FAO (2008) said that Qatar is a small cape covering the land of almost 11000 km square and showing the rapidly increasing population. With this current situation, land management strategies need a significant change as the suitability index of agriculture is still high which exposes great feasibility for agriculture in this regard. The challenges for management cops and farmers are the unavailability of resources for irrigation. In the unavailability of natural sources, more cost is required to invest in the agricultural sector, which is the main reason that land remains vacant and firms have to forego their profits as crops are not implemented which can be gained by investing in this area. These strategic framework recommendations should be utilised by the public sector to improve their land management strategies.

As the outcome of the research findings, agriculture, infrastructure, and recreation are the significant constraints that need to be considered for a successful strategic framework. The agricultural aspect can be demonstrated with the study of Hrelja (2015), in which quantitative analysis of productive land strategies shows the current trends of computer simulation trends and latest analysis techniques which provides the decision power by analysing the environmental effects on crops. These current trending models give the relation between climate, agricultural land, and crop performance for more quality products based on provided knowledge. Bardosetal. (2016), seen in his research work that the significant trends in land appraisal saw in ongoing

decades have been a move from summed up appraisals to increasingly explicit use evaluations, expanded utilisation of soil factors and for the most part the expansion in endeavours to measure assessment results. For sure, the requirement for progressively land sustainability gritty data ashore reasonableness for explicit uses appears to exist in creating nations as well as in created nations. An investigation directed in the United Kingdom and referred by Rimaletal. (2015), whose point was to look at British farmers' degree of knowledge on their territory limit with their appropriateness for explicit uses, demonstrated that as far as increasingly broad appraisal, makers were superbly aware of the nature of their property. They were, anyhow, substantially less educated about their genuine suitability for the particular purposes that were looked into. This is explained by the study of Sallis et al. (2016), in which he said that lots of complex factors are involved in the analysis and bulk of data required for fully quantitative analysis. He further noted that quantitative analysis must require numerical parameters for statistical outcomes and on contrast Anguwlovski et al. (2016) disagree with the fact and told that analytical results are not enough for evaluation and physical evaluation is also required for productive results.

The findings from the responses of participants from the public sector highlight the need for strategic change in institutions of public sector organisations. Frigo and Anderson (2009) stated that change management could be a significant contribution to the development of effective land management strategies. Through this, the different functional levels of working in a firm can efficiently work with the same management techniques. The frameworks discussed in this research are the essential aspects of urban planning and land management, which organisations can quickly adapt. On the other hand, this can also play a significant role in the economic growth of Qatar and Qatari household's importance can also be evaluated for the optimum land use(Frigo and Anderson, 2009).

On the other side, Gounaridis et al. (2019)said that the cellular automata model provides the transition and possibilities of land use changes with appropriate mathematical rules. These possibilities are revealed through the new geographic metadata for large scale land use. Companies can perform standardisation of models with the broad frameworks of cadastral data. These cellular automata will help the companies to realistically found the land-use boundaries where the change is expected, and additional information will be provided with the cadastral metadata like info about land users, property rights, current land. In the field of geo-location of urban areas, this model

primarily uses descriptive and spatial data for the production of a reliable model for land use. It also incorporates new elements simultaneously in the process of decision making (Yuan, Van Der, and Khorram, 2009). This model plays a vital role in the prediction of land patterns and evaluate efficient land utilisation. Identification of land-use competition is also necessary in this regard.

Another aspect of findings shows the importance of awareness of different frameworks for land utilisation. The conceptual framework discussed in this research can be used for this purpose as per the study of Savin-Baden and Major (2013), the conceptual framework for urbanisation and industrialisation of Qatari public can play a significant role. The evaluation performed in this research highlighted the tremendous urban growth of Qatar and its effects on land use management practices. The findings display that urban designers in Qatar have to focus on the maximisation of sustainable development. Shandas, Makido, and Ferwati's (2017) produced study explicitly based on the Doha region and highlights the strategies of Doha in development patterns that are similar to the western cities as Doha is that capital city of Qatar and has a significant impact on the urban development of Qatar. The infrastructural development also affects different mega projects as one of the future events of football world cup 2022 needs a major physical transformation of Doha Al-Thani et al. (2019). Qatari population is viewing an unusual growth, which was mostly because of growing expatriates in the county. These expatriates are reaching Qatar to get new employment occasions and get a settlement in the area. The perceptive is that Qatar has become one of the top destinations for expatriates as in 2017, almost 89% of expatriates are part of Qatar (Bel– Air, 2017).

Careful land usage had been explained by Kite et al. (2016) as a process through which, piece of land is allocated and zoned to maintain a balance between residential, commercial, industrial, and farming and charity lots. It is this process that ensures that a properly developed city comes into being. Since the city's development depends on how productive its inhabitants are, being able to increase its revenues by allowing it to grow enough goods that it can then sell to other cities. This shall become possible if the life of inhabitants is not punctuated by getting stuck in long traffic queues, dying on the way to the hospital, or lack of clean water and other utilities. Certainly, zoning can create chaos because residents either work in industries or commercial or agricultural areas to make their living; they send their kids to schools, colleges, or universities. Visit parks for recreation and go to hospitals for medical aid. So, if a city is well laid out, then traffic for schools can avoid

clashing with transportation related to industrial and commercial centres. Similarly, residents returning from work to home shall also not be thwarted by the people visiting community lots or parks, thereby, allowing them to save time and instead use it more productively.

In contrast to a well-planned city developed without usage of proper tools, Brown, Sanders, and Reed (2018) concluded that such cities become a hub of chaos and violence as people would often feel irritated to travel due to fear of getting stuck in a traffic jam. As a result, their productivity at work would suffer, thereby affecting the cities revenues. In the absence of a plan, school traffic would clash with industrial and commercial traffic that would lose students from learning due to the already stressed-out brain. Loss of concentration in education can cause them to fail in understanding the concepts that are crucial for every technical field. Lack of knowledge shall make them incapable of dealing with the practical world, where they are supposed to deploy their learned skills and benefit the activity by taking it to a higher level. Furthermore, not being able to reach medical aid in time shall deteriorate the health of the residents, this shall also serve as a counterforce against their productive work thereby making them incapable of doing work and generating to the good of Qatar's economy.

6.4 Theme 2: Objective 2

The results of the descriptive analysis of land development displayed the current land-use strategies of the private sector. Knickel's (2012) study showed the current trends in land use and the constraints, which are affecting land management. The existing practices concerning land management are needed to be changed as changes in the global population in 2030 can amount to a growth of 36% as compared to 2000. Furthermore, the area of cultivation also decreased up to 0.25 as compared with the last 50 years. According to De Wit and Verheye (2009), the sustainability practices in modern countries are near to non-existent, that is why rapid decline is observed in the available area for cultivation. The African continent land ratio observed in 1965 was 0.62 ha and decreased up to 0.62 in 1995. The reason for this decrease in the land is due to the increase in population. The author suggests that more sustainable and robust land management practices should adopt by countries.

One of the fundamental aims of this research is to analyse the current trends and frameworks used in Qatar public sector land utilisation and development and based on findings; it is observed that the current trends of land management because the population in 2030 all around the globe can

amount to increase of 36% as compared to 2000. Land utilisation planning should be changed according to the increasing trends in population and improving period. In comparison, the research of Karen (2013) provides evidence that is screening an instant change in the construction sector plan. The reason behind that the trends and structural planning used in the 2000s have changed a lot now. The infrastructure of homes changed a lot as room sizes and floor plans are changing, and attached bathrooms with every bedroom are required now. Another main reason for the increase in population is the construction companies of the public sector. In contrast, Karen (2013) highlighted the fact that besides the size of homes, a household type has also showing swift change as in the 1990s, the construction plan of urban areas mainly consists on single-story houses and now due to increased population single-story houses are not constructed, and high buildings are preferred now. Latest trends of urban planning more emphasis on the construction of high buildings with many apartments in it so the needs of many people can be adjusted in a specific piece of land. Another benefit of this urban planning is that it is the most affordable method to fulfil the needs of an increasing population at a lower cost. In between the period of 2010 – 2011, the trend of single-story houses is quite small, and now it's almost vanished. Bel-Air (2015) also discussed the patterns of urban planning and said that the changes in the previous plan could create new opportunities for companies of the public sector and also help to get higher profitability by adopting a difference in their construction practices. The justification is that the continuously changing population trends in Emirates because of the increase in migration of non-Emirates and this increase in population immediately required a change in urban planning. The findings show that these new trends will provide new opportunities in the construction area due to which these construction companies hire more non-emirates workers. Rather than that, mixed marriages are another reason for the increasing population trend.

Based on the findings obtained through quantitative analysis, it is observed that for regulatory authorities, it is critical to have adequate land development planning. Del Prado (2015) said that for effective land use planning, management legislation has a significant impact as implementing the law with careful observations and compliance can support optimum land-use practices. Some of the critical factors that have a substantial effect on the performance and efficiency of the land market are planning standards, developing the land, regulatory procedures, and registration of processes. These are the professional standards decided by the industry but insufficient for all territories. The collection of these procedures with laws and regulations can reduce corruption and

increase the use of land. The overall impact of these principles will enhance strategic land management. Another outcome of the research is the land tenure challenges to land-use practices. According to Hertel (2016), to apply land-use methods easily, companies should develop their land use tenure. One of the beneficial land-use techniques is improved mapping, which improves the use of land. Sequestration is another challenge to maintain the use of the property as it increases the prices of food which is a challenge to sustain effective land use with prices.

Furthermore, land damaged by environmental factors is a challenge for land users and required actions that increases the cost and result as increased prices of food. Competition for land may also increase the land cost, which reflects in the products that are why competitive analysis is essential for making the right decisions that help is the effective use of land. These land-use practices will help in the betterment of environment and cost reduction but these practices are not the solution to all problems and have some limitations. The methods allow users to advance geo-information and conduct analysis to have altered info related to the local dynamics and the use of land and its changes (Msofe, Sheng and Lyimo, 2019).

Payne (2019) also agreed that external factors like climate change, increased population, and globalisation is the drivers of land-use practices. The author also highlights some challenges of land management, which are regulatory barriers, the economy of land, security of land tenure, and the rise of neoliberalism. Furthermore, the research identified the most common factor that required land management practices are conflicts. However, for the policymakers and residents, the legal system of land tenure is a challenge while developing policies of land use management. For land users, the ownership of land can be restricting force despite being a benefit for them. That is why governmental support is essential to avoid these challenges, and the government should also promote the range of tenure options that can be beneficial for land users to meet the needs of people. Boserup (2014), have also highlighted the cause of underdevelopment of the society, which is illiteracy. Educating the rural population to make them cut off the trees, overfishing, and haunting is distorting the natural eco-system is become so essential now. Resourceful and effective land management and development can help to educate and control this. These widely spread socio-economic reasons are the causes that affect the global economy.

The findings developed by analysing the survey questionnaires have highlighted the point that policies and procedures related to land development should be able to make effective and

sustainable land development. According to Msofe, Sheng, and Lyimo(2019), companies need to understand the dynamics of land use for sustainable land development. Sustainable development of geographic landscapes includes the flow of energy, landscape, and biotic conditions, and other physical characteristics of the land. Smart utilisation of lands required the standard environmental management and eco-system protection. When it comes to the agricultural field, the main issue raised in land use is the erosion of soil. Sustainable land-use practices enable users to overcome the many land issues like this. It allows companies to effectively use the biophysical resources, including agricultural, industrial, and logging use. These practices also help companies to make informed, rational decisions for the sustainable use of land.

The need for new practices of land use is raised due to the scarcity of natural resources and the increasing population. Increasing the community becomes the reason for more land demand, and without proper utilisation of land, the issues and corruption will be increase. Land use has been subject to a natural environment that is why it is critical to understand the drivers of land utilisation for planning land use. This research analysed that in the current situation, increasing population demands for the land and associated resources with it, such as food and employment. Besides that, some economic factors are also the reason for the need for transferring from traditional to modern models such as an incentivisation for prices of the crop.

Davies et al. (2015) demonstrated the fact that sustainable land management can play a sufficient role in land restoration. Based on this research, one of the practices to adopt sustainable development is local governance, which is based on the local rules. This practice will help to eliminate tree cutting practices, wasting water, and other users of a natural resource. Penalties and charges should be imposed on hunting of wildlife and tree cutting practices. Another method for sustainable land is the implantation of forests and trees to get new natural resources. These practices will surely bring the positive transformation in the environment and result in an increase in rainfall which will increase water resources, maintain the climate changes to appropriate weather conditions, and increased the opportunities for agricultural supplies.

Furthermore, this will also open the new housing option for wildlife and people can live in these areas, which will increase the conversation of wildlife. These aspects will encourage the companies to invest and build houses in these areas, such as FMCG firms and other companies. These

sustainable land use activities will maximise the local and governmental accountability concerning the management of resources.

De Wit and Verheye (2009) highlighted some problems and challenges in the public sector and the major constraint urban planning is not in place, and companies involved in construction have improper plans. Every company has its way of working and activities which negatively impacts urban planning, and this is the lacking quality in infrastructure. Many challenges are faced due to the economic issues of the country as to develop the advanced infrastructure, the available fund is quite low and not sufficient (Nair, 2014). Public sector organisations are facing issues to manage urban planning with the limited funds provided to them. That is why it can be said that the challenges faced by the public sector have made a negative impact on practices of land use and its effective utilisation. Gamborg et al. (2012) said that the suitability of land use as an ethical issue. The study emphasised that farmers are using bioenergy production practices to raise their production, but the use of this technique is a moral issue and decrease the acceptability of projects.

6.5 Theme 3: Objective 3: Practices from a sustainable development perspective.

This research also presents the difference between both strategies and how they both impact land utilisation management. Islam, Rehman, and Jshimuddin (2018) identified the fact the Cellular Automata model is an approach to predict strategies. The focus of the model is making sustainable land use, and it defines the starting point with images to change simulation while the ANN worked with the multilayers which sense the images with remote classification. Artificial neural networks based on the empirical evidence, maintain the relation between developers and land users while the Cellular model based on the methods of trial errors. In the ANN model, people are not bounded to define the explicit rules and make them transparent, and on the other side in the cellular automata model, people have to set the rules clearly to make them open.

The quantitative analysis through descriptive statistics shows that strategic land development practices can play a significant role in Qatar's land utilisation as per the respondents of the private sector. The central part of responses is generated from neutral criteria in which participants agreed for sustainable land development. De Wit and Verheye (2009) suggested some issues that can arise in the event of sustainable land, and these issues may have a negative influence on land management. The author gave an example of Africa as the country made a lot of effort for the development of sustainable land to achieve the globalisation opportunities, but political instability

was the one major issue that arises in the event of viable land. Hilhorst and Songwe (2014) also highlighted some other factors which can degrade land use management. The constraints are cultivation and agricultural yields. The reason is that the area available for agriculture is much higher than the actual region using for cultivation. The cause behind this yield gap is insufficient planning by public sectors and construction companies. In public sector institutes, more land development initiatives can be explored. This can play a significant role in economic growth in Qatar. Furthermore, the property rights for Qatari households can also be evaluated and can be beneficial in optimum land utilisation.

In the third interview question, participants have highlighted some considerations, which should be focused on while adopting an inclusive strategic framework for sustainable land use. De Wit and Verheye (2009) research in this aspect said that these strategic frameworks can be supportive to enhance the economic stability of countries and can also transform their GNP (Gross National Product). Furthermore, the authors showed that 44% of individuals from all around the globe are mostly doing farming as their sole work alternative. This occupation has empowered them to be ever-evolving. Agribusiness is a process of multiple activities that include animal raising, milk production, cropping, harvesting, and others to fulfil the basic food requirements. This agricultural industry is based on the natural eco-system, including forests, water reserves, fertile land, and temperature. All these natural resources are not renewable and in case of redeveloping them, a lot of time will be required, so these resources are a valuable asset of the world and play a vital role to Active County's economic health

The results steered in this research are revealing that better land usage could not only take the economy of Qatar to a much higher level but this careful and well-planned usage of land. It could also support the economy of Qatar in the long-term as the country is sea-locked and therefore should use this non-imitable natural resource carefully. This careful usage of land could be achieved through the devolution of policies related to sustainable land usage UAE. The policy is the way of controlling both private as well as public factors doing land-related activities in Qatar. This aspect is visible through the research conducted by Alawadi, Khanal, and Almulla (2018). Land use in the context of Qatar could aid in strengthening the economy by prolonging the provision of this limited resource otherwise threatened due to its misuse. Interestingly, Langemeyer et al. (2016) presented a contrasting view and emphasised that careful planning of

land is a programmatic document allowing urban and rural construction and land management practices.

Research outcomes of Woertz (2017) study highlighted the fact that land improvements enacted in 1950s and 1960s, and as a result liberalisation caused in bureaucratic reforms that influenced both the public and private sectors of the Middle East. Saudi Arabia efficiently transformed its position with land reforms which enabled the country to gain self-sufficiency in the agricultural industry to adopt higher trends in land development. Concerning the Middle East companies, the contribution of Saudi Arabia was highest with amounting to 20.2% in 2012. This study emphasises on the development of effective policies like Saudi Arabia for sustainable land management and also should be a source of income for individuals.

The effect of sustainable land use was positively supported by the results of a descriptive analysis performed in chapter five of this dissertation. As per the analysis, respondents strongly agree with the positive effects being felt in the overall economy of Qatar due to a reduction in traffic congestion on the roads. Loss of fuel during massive traffic jams, medical bills as well as such sustainable development of land can also aid in cutting down the emissions into eco-system. Sustainable land development is depicted by AB2 and AB3, responses to this duo fall between neutral and agree, this pictures recognition of reality related to this factor. Answers for AB1 and AB2 fall on strongly agree on level and these were levelling unto 56% and 50%. While, in AA3 solutions were falling on agreed criteria, and this percentage was almost 32%. These responses had been gathered through employees involved in public departments.

As per Al Naimi, Karani, and Littlewood (2018), one of the significant challenges in the application of sustainable land usage practices is the management of the different interests of the various stakeholders. Stakeholders are a group of people who have the power to affect the creation and even implementation of these policies because these policies can eventually make these people. In the context of Qatar, such people include government in general and some departments in particular, army, society in general, farmers, land developers, corporations, hospitals, schools, and others. All these people shall be particularly affected by land-related problems, even changing their operations permanently. Therefore, they could be brought on one page claimed Zaina (2017), engagement by the land department with all the stakeholders could bring to sight these people's concerns against land-use planning.

The findings of this research also highlight the importance of technology and its impact on agricultural production as it is affecting the utilisation of land (Pretty, 2007). The research preview whether the effects of the latest technologies supportive in crop production or not and according to the observations, technology can enhance crop production over time. According to Pretty (2007), many areas with the advanced legal system are offering property on a lease so that farmers can investing it and get output production, which can make the most of their earnings as well as productivity in agriculture. The social factors are changing due to the trend of rising in income distribution, and that is why rich people required more places based on their family needs. They also prefer single-storey houses and do not find attraction towards high rise building systems which is the reason for issues in the housing of a large population in the limited area. These social trends are revealing a profound change in land utilisation management. The deterioration in the agricultural sector might be seen as one of the outcomes, and this can lead to the possibility of a decrease in economic development and growth of the region because the reduction can cause in decline in GDP or national income contributed by this sector, which can ultimately influence the economic development (Nair, 2014).

The findings of the research show the need for new policies and strategies for the development of new systems; the first step is planning. It is a pre-process of policy development for efficient land utilisation. Companies can develop the best land consumption policy through proper planning first. There are some objectives include in the planning process for Qatar's new system of land utilisation, and one of them is the division of land. This is necessary to full the social and economic needs of society and also helps to preserve the resources of the future(Hamdouch et al., 2016). The land is the primary and most important economic resource, and rapid urbanisation is negatively affecting the area (Long et al., 2014). Nelson (2014) stated that area could be bright for construction by pushing back the sea, but this strategy is not a viable option, and logically, it cannot be sponged off entirely. The world's one-third part is covered with water, and that is why it is increasing day by day as the impacts respired into the sky from the smokes caused due to human activities (Harvey, 2018).

As per Middleton (2017), highlight that Qatar's higher landscape in deserts is also a reason for the land limitation. The theories of Shepherd et al. (2016) also stated that changing the ecological environment results in sand storms and the reason behind it is human activities. Rapid

constructions and developments are causing dangerous pollution exhaled into the environment in the form of fumes and fuel-guzzling. Doha's industrial spread is the home of many foreigners who are also changing Qatar's economic activity but they are free from paying for the long-term damages.

According to Zaina and Furlan (2016), the land of Qatar is getting limited day by day because of the natural causes like floods, sand storms, and heavy rains are the alarming situations for Qatari government to take actions regarding it and take preventive measures. The Emir of Qatar, Sheikh Tamim Bin Hamad under the vision of Qatar 2030, has identified the land development policy in Qatar. The planning evolves in land development policy required the influence of traffic jams, high carbon emissions, loss of fuel, and highly populated areas on Qatar. The authors Zaina and Furlan (2016), said that the Qatari government is the role model for its citizens, and the government has the authority to network them with the law of division. Many stakeholders are involved in land development from which some are the powerful ones and only be controlled by the government so the government should make policy concerning both healthy and influential stakeholders of land development to fulfil the social needs.

Researchers Brown, De Bie, and Weber (2015) highlighted that these stakeholders comprise land buyers, investors, and land users. The Qatari government has to take into account the buyer's demands that influence land usage by the land developers while planning the policy. Haque and Asami (2014) also noted the other side of the picture land developers emerging the assigned land being industrialised using universally defined principles of land management. The developers must be following the policies for land development procedures, and the Qatari government must use its power to plan an active strategy. By adopting this policy, the zoning can be governed by the type within a city, several lanes between communities, size of the road, approaches adopted to decrease the ecological influence on the environment by defining a tree ratio per lane routes which are connecting each community with another, alternative route and parking slots. These factors will make a land development policy robust and efficient.

The research of Rizzo (2014) also stated that the master planning of several years and also concerning the current growth rate of the population would be a success. In addition to this, economic activities have the potential to create issues in the development of megacities. Kaphengst (2014) has clarified that this is the reason that megacities are being developed using some

principles. These principles are known as five pillars of land management, and in the making of Qatar's land management policy, these pillars will help to make it successful. These pillars are productivity, security, protection, viability, and acceptability.

As the main aim of this research is to identify the best land utilisation policy for the public sector of Qatar and based on the findings collected through the survey questionnaire from employees of the public sector of Qatar, it is observed that the Government has a significant role in land utilisation policy. Fleskens and Stringer (2014) researched that the government has the authority of controlling the land users. The severe punishments should impose in case of not following the policy to secure from the decline of economic and social sustainability of society. Zoning of the city is a significant factor to generate the economy of the country. This zone planning will help in sustaining all levels of classes in society. The fuel of economic disparity is the central market of the region, and it is the principle that makes the wealthy people wealthier and poor to more miserable. The role of government in this matter is to make devising policies and its proper and forceful implementation to avoid the poverty of the society.

Gatto, Wollni, and Qaim (2015) also evaluated the role of active policy in decreasing poverty from society. The wealthier land developers have resources, and their capacity to buy lands/property for investment purposes can affect land development in Qatar. Increased prices of these lands restrict the lower-class population of Qatar to buy homes for a living. Same as this, the farmers also fall victim to the landowners. Warriner (2014) have shown that land management policy's implementation should help in farmer's trouble with land developers as the land developer's commitment to buying land without thinking about its productiveness for sustaining the Qatari society's economy in the long-term shall miss the parts of productive land. It will also impact the production of original items and become the cause of an increase in misbalance in society. The farmers will also have to suffer from land loss as they will lose their source of income which will affect their living style.

Already developed land utilisation models identified in this research from which Cellular Automata is one. Basse et al. (2014) summarised that this model could be proved beneficial continuously because the model is based on four principles, including, region space, transition rules, time steps, and cell states. The land is specified with space zones, and these zones have an impact on surrounding as development, in particular, will change the plan of the whole region.

Like to connect the country's economic hub with remote areas, a street is developed which connects them but after some time when the population increased, and housing or commercial activities will crop up the street's both sides. Artificial Neural network is another model, and according to Qiang and Lam (2015), the latest computer software and programs can predict the land-based maps with the historical records of development to predict the future image of the land. This model represents the mix of primary usage of land and technical progress and produces the idea of socio-economic conditions.

Yuan, Van Der, and Khorram(2009) further evaluated these models based on their characteristics. The artificial neural network model has some elements irrespective of the implementation logic. For instance, the model contains the neurons which process the data, and this data is based on a large number of weighing. The connection between these weighed elements provides a proper data representation. Companies can implement this model for knowledge acquisition regarding land utilisation. The model has the ability for the classification of land use and contains patterns for the analysis of land use. This model is way too better than statistical methods as they offer quality information without any non-parametric data. Due to its image classification characteristic, the model does not require any previous knowledge regarding lands and sense the remote data automatically.

The model has multiple land utilisation benefits but also has some operational issues as the network architecture is dense and complex and required a large size of data for quality training. For instance, the quality output is based on the practice of data sets which represents the complete description of every category individually. Another problem in the model is the number of input and output nodes are already defined by the application and identification of hidden nodes can be difficult while dealing with a single layer problem. The model is involved operationally, but the model's variability in the desired classes can increase land use. It provides the accuracy required to decide for land utilisation (Yuan, Van Der, and Khorram, 2009).

Findings of the research also highlight the importance of urban planning in land utilisation management as Schulte et al. (2014) reflects that the lands with adverse climatic conditions can be maintained with the urban planning as it can keep the land management positively. The justification is that urban planning opens the opportunities for different business activities in which includes the development of marts, retail stores, malls, and grocery markets. This will result in

increasing the trading activities of the area, and by maximising the trading activities in any region, the country's economic conditions grow with high speed, and this will enhance the living standards of the economy. Frigo and Anderson (2009) said that change management could be contributed to efficient urban planning. Public sectors of Qatar have to develop new strategies for urban planning for the accommodation of a higher population with a specific piece of land. These research outcomes will help the public sector of Qatar in the development of Qatar's national economy and Qatar national vision of 2030.

As per the requirements of the research topic, qualitative analysis is performed and observations obtained from the first question of an interview according to which, improvements in land utilisation initiatives required in Qatar show that enhancements are needed in policies of land utilisation. Regular investors should invest in government properties for commercial and private land use. Furthermore, findings also showed that the main factor of a country's economic growth is its partnership with different sectors. Kerr et al. (2016) produced a study based on a similar research area of Brazil for land utilisation and considered it a categorical system along with presenting some ideas of the FAO (Food and Agriculture Organisation). For instance, with isolated soil characteristics such as surface, absorbency, etc., are not enough and construes these attributes in terms of environmental assets such as water accessibility, nutrients, etc. Kerr et al. (2016), also said that, however, the main features that have delayed the dispersion of the methodology are the struggle of its understanding by non-specialists in the field and the non-application of the organisation in some cultures. The researcher proposes as critical measures for the enhancement and promotion of the use of this methodology as its adaptation will enhance the county's main crops and will improve the quantification of the environmental potentials used in the assessment.

6.6 Theme 4: Objective 4

The research outcomes suggested that proper planning is significantly essential for land use and during the preparation of land use, social interactions, and economic developments should be considered. Interests of public and private sectors should also be considered, and innovative approaches must be taken into consideration. These practices can help land users in land management activities.

The study of Reitsma et al. (2015) said that to meet the needs of an increasing population in the world, agricultural production should increase. As food facilities are already insufficient in many

undeveloped countries and this will be expected to continue in coming future as well. In contrast, developed countries' need for food is not a problem now, but the growing environmental issues linked to the production system become a challenge in food formulation. Madbouly (2009) highlighted some elements for urban planning in Middle East countries, in the last 20 years, the land management strategy was introduced, and the approach suggested new housing options which support urban planning.

Furthermore, another essential facet of the plan is to upgrade the land by gaining informal settlements. Based on that, the regularisation program was introduced, which helps a lot in old areas redevelopment. Political and central policies may also have a significant impact on land management. With these land management strategies, the socio-economic development of the country can also be achieved.

The findings observed from the second question of the interview show the diverse aspects of land utilisation frameworks from which one point is religious practising places are more as compared to the commercial facilities. Participants suggested that currently, the central element of land utilisation is providing accommodation areas for citizens; meanwhile, the metropolis is implementing the strategic plan of development such as commercial aspect. Al-Thani et al. (2019) stated that the call for the land is increasing in Qatar for industrial development and residential purpose and currently the land in the country has become to some extent expensive due to its shortage as the population is increasing day by day that is why the land utilisation effectively is pivotal. In Doha, which is the capital of Qatar, it can be observed that 80% population of Qatar exists in the city. Neither this land is justifiable or secure, nor it comes in the liveability directories of numerous global cities indexes. Nyanga Kessler and Tenge (2016) found that the overall financial states of Qatar and the profitability of the land's impact on Qatar's GDP. Primary products of daily use including dairy, fruits, vegetables, animals raising for eatable meat utilises a similar land as the industrial factories using for secondary products. It is conceivable to set up such manufacturing plants on a bit of barren land. The trees, rivers, lakes, animals living on the land and underwater, all have a significant influence in keeping up the natural eco-system.

According to Hrelja (2015), land utilisation management research is a relatively new field, although there are many different aspects of land use, mainly agriculture, forestry, environmental, and ecology, which have been considered for many decades. Now countries are more emphasising

on land use development, management, and what future consequences land-use modification may cause. According to Yilmaz, Çağdaş, and Demir (2015), a classified sequence of uses is expected in the agricultural system of Brazil, which is implied in the definite structure. The system works in a descending sequence as the primary goal will be considered first and then further sub-goals will be considered as the best land is assigned for annual crops and the rest of land unsuitable for cropping used for the other agricultural purposes. The reason for this classification is to provide more considerable attention to food production, and the concept is also applicable as, if the land is useful for short cropping cycles, then it will also be helpful for intense and long crop cycles. Not all cultures are agreed with this Brazilian agricultural system, but the main point of this classification is to utilise the unfit land for environmental preservations.

The research work of Kerr et al. (2016), also based on the similar exploration area of the Brazilian system for land utilisation and even mentioned it as a definite system but along with some other concepts of the FAO system. FAO stands for Food and Agriculture Organisation, and the author's study said that with isolated soil attributes such as texture, permeability, and others can be interpreted in terms of environmental qualities such as nutrients, water availability, etc. For the expansion of these concepts, food and agricultural firm combined the experience of a Brazilian classification system and American soil with the knowledge of combined surveys (Kerr et al., 2016). Though, because of the connection between the concepts and various interpretations, a new term introduced to represent the concept which is 'suitability'. While land-use size valuation typically refers to extensive agricultural uses, suitability within the FAO system suggests the clearly defined land-use practices.

6.7 Implications to Stakeholders

Stakeholder analysis is performed in this section to overview the influence of research implications on different stakeholders of the public and private sectors. A significant challenge in implementing land use planning policies is the reaction of these groups, so, once their concerns come to Light, shaping of these policies shall become easier. According to MAHMOUD (2018), the stakeholder has the power to follow policies and cast their effects into shaping the future of Qatar's economy as per the vision reflected in the minds of policymakers. From chapter five, it is apparent that most of the stakeholders agree on the implementation of policies regarding sustainable land use.

Therefore, their concerns must be alleviated, in the landscape of Qatar; these stakeholders could be put into the following two categories:

6.7.1 Public sector stakeholders

6.7.1.1 Government

Shubbar and Furlan (2018) observed that the government, in general, is concerned with the running of Qatar in the long-term because of its obligation toward people voting it into power. This responsibility shall be deemed achieved if Qatar can provide aid to the global economy through features that are unique to it alone. Therefore, the government already feeling the heat from the worldwide community to contain the effects of Qatari economy on the global eco-system, change in which, is not only threatening Qatar itself but the entire globe. Thus, the government is very interested in implementing policies that shall trigger sustainable use of land in Qatar, thereby supporting the burgeoning populations' housing requirements. Dietary requirements, financial upkeep of the Qatari economy in long-term and reduced effects of human activity on eco-system, thus, reducing the change in climate and decreasing its catastrophic results on the global community. Such impacts include the thinning of the Ozone layer. Since these policies affect all stakeholders, this then requires gleaning into what its sub-departments, Qatari society at large is thinking, therefore, this chapter of the research can aid the government in getting an idea about kind of policies it should devise. In this way, the Qatar government shall not trigger a challenge from concerned quarters while simultaneously, it shall be able to implement land-use policies and reduce Qatar's land-use effects on the global community.

6.7.1.2 Land department of Qatar

Rizzo (2017) summed that the land department of any country has a significant role in aiding policies relating to land use. This is because land management is based on the devolution of a piece of land between commercial, residential, industrial, agricultural, and community types. Each type is different from one and other due to nature of activity conducted on it, this activity generates different worth of revenue for the land user and therefore, price of land must be set while keeping this in mind, another thing is period of lease for which this piece of property is being offered. Until this period ends, the department shall not be able to earn through this land. Another factor is the yearly tax being received for this land; type of zone again comes into play and shall be higher

based on the level of activity; damages being suffered by that particular piece of land due to that activity. Besides, the impact of this activity on the immediately surrounding area due to excessive water use or other natural resources.

Moreover, the level of exercise can severely taint the eco-system. Since the land department has these stakes to consider as well as ensure that efficient usage of land is being done at the same time, therefore; it is also one of the significant public stakeholders. The policy implementation can affect the revenue being earned devolution of land because, during the execution of policy, a piece of land cannot be made industrial if it could be better used for agricultural activities.

6.7.1.3 Revenue department of Qatar

AlSuwaidi and Furlan (2018) explored that the revenue department is the finance division set-up by the government to manage public revenues and expenses. Qatar is part of the most visited place in the world; therefore, historical sites must also be preserved during planned usage of land to attract foreigners and a potential source of income. Besides, transport infrastructure and hospitality infrastructure, as well as, to some extent availability of food as per these foreigners' taste is also pretty necessary to aid the stay and movement of foreign visitors from one place to another site. Naturally, transport layout shall affect revenue from foreigners as shall the preservation of historic sites would. Therefore, the revenue department should not only have to take into effect the financial cost to the Qatar economy of constructing, maintaining, and running such a system but ecological damage to the Qatar of this system. More technical such a system is going to be, higher the amount of import bill is going to be, possibly tipping the trade balance on imbalance side.

Qatar's army

Fadli and AlSaeed (2019) found the reasons behind the army's success in the countries defence is the availability of quick landing spots for fighter jets. These places include wide roads, a piece of land far removed from residential areas, or public activity. Besides, the land-use policies can also control the construction height for buildings, reducing the risk of collision of fighter jets with them in case of during war conditions or emergency following the occurrence of a natural disaster. Further, allocation of places for public landfills can also resolve troubles for the army in the form of loss of visibility due to columns of smoke issuing from places scattered across Qatar, not controlling air pollution can initiate smog. Zilinskas (2017) explained that the burning of wells

allowed respite to the Kuwaiti army during the war, as it clouded the visibility of the attacking army; thus, clear demarcation of such places is essential. Moreover, the provision of land for training its troops for war-related manoeuvres can also severely taint the army's ability to defend the country. With this research, the government can get a better idea into numerous other concerns simmering within this strategic asset of Qatar.

6.7.2 Private sector stakeholders

6.7.2.1 For Foreign Tourists

Furlan and Sipe (2017) noted that foreigners visit Qatar to view its natural beauty as well as get an idea about the country's rich history. Under vision 2030, the government is intent on increasing its revenues from industries other than just selling oil or gas. Income from tourism being the second most important source is the cause of concern for the department of revenue, department of land, and government in general; the industry is also a significant source of income for the Qatari society in general. However, to sustain this industry, a well-connected and efficient transport system must be laid out, as the system shall enable the foreign visitors to get to different sites without causing additional traffic congestion on the roads. Also, the model can support the government in reducing the emissions from the regular traffic by accommodating the general public of Qatar within this system as well. The Transit system shall facilitate the reduction of general society's cost of living in the form of personal cars, but it shall also lend a reduction of transit times arising out of congestion on the small Qatari road network.

6.7.2.2 Hospitals

Al-Dewik et al. (2018) observed that clinics and hospitals operating in Qatar are materially affected by how a city is planned. A hospital or clinic is a place of health and respite for the person feeling sick and not being able to get to work. Thus, these places of health shall be able to discharge their duties if they are easily accessible to the general population of Qatar. That is they can be reached by a road network as well as public transport with ease and without getting stuck in usual road congestion. Qatari government wants to plan the use of land for an economically better from before the economy and economy stems from its people. However, if these people are not healthy, then they would be lethargic all day long. This sluggish attitude shall also affect their productivity, which in return shall cause an economic slowdown by customer orders not being fulfilled on time,

thereby delaying exports or even imports. Moreover, with climate getting worse, emissions getting stronger, and commuting people's number on the roads increasing by day the role of hospitals and clinics is not only becoming more important but is also becoming challenging to maintain. There responsibilities' discharging shall be made a lot easier if policies controlling land allocation for the type of activity is managed through the drafting of policies channelling economic activity of Qatar.

6.7.2.3 Qatari society

Salama and Wiedmann(2016) found that if people are strong and healthy, they would be able to work productively, adding to the economy as a whole every minute. In contrast, preoccupied people, commuters stuck in a traffic jam, people wearied through sickness are considered more of a burden because they consumer but do not generate to the economy as a whole. This is the reason that the people of a well-planned city are considered more yielding than people residing in a town that stifles under traffic clogging because half the day time is lost while cursing on the road to office. The rest of the day passes by with a person's mind pre-occupied with post-traffic trauma. The general society of Qatar includes professionals, labour, house-wife, patient, doctor, industrialist, student, and varied people. All these people want to get to their destination in time and be not troubled by a group of people hurrying toward their destination. Because each person could play a beneficial role in the development of Qatar under the government's vision 2030, students are considered future pillars of the economic upkeep. Therefore, their studies must not be punctuated with irritating transit times.

Similarly, professionals (including both private and government) are working for the economy in some manner by thinking strategic direction for their charge, to skirt it around external forces. Therefore, their time is essential, and it can cost the economy billions if lost while being stuck in the traffic. The labour class performs work in this strategic direction. Thus, they must reach their work on time; otherwise, the economy as a whole shall suffer from orders remaining unfulfilled. To keep supporting all these activities, land use should be made efficiently, to ensure that these people reach their destination in an untroubled manner without getting caught in a swarm of traffic that does not concern them. Policies, directing zoning of land could aid draw a line, thereby, connecting residential areas through roads bypassing schools or hospitals or other commercial stripes. Similarly, schools or hospitals could be zoned as far away from industrial places to assure

that children and patients are not pinned among heavy traffic resulting due to industrial activity. All this could be made possible through policies managing land use; therefore, Qatari society as a whole could also benefit from such and would support the government in this regard.

6.7.2.4 Multinationals working in Qatar

Suresh et al. (2018) examined the effect of policies on multinational and local businesses' profits regarding land use planning in Qatar. The authors found that by playing through the rules and regulations, devised by the government, companies operating in Qatar would be able to work sustainably as they would not have to face costs in the form of penalties being imposed by the government for using land that is fit for agricultural activities. The operation of multi-level corporations as well as local start-ups is vital for the economic development of Qatar because one of the sources of government revenues is to tax these companies. Nevertheless, an economy shall be able to operate sustainably in the long-term if it applies fair usage of natural resources, and for Qatar, this is essential because it is densely populated but has limited land to conduct economic activities required for the running of the economy. Under such a scenario, logically these companies, as well as the government, want to apply fair usage of land to be able to operate sustainably in the long-term and continue providing benefit to their stakeholders until the foreseeable future.

This aspect is visible through the research conducted by Alawadi, Khanal, and Almulla (2018). Land use in the context of Qatar could aid in strengthening the economy by prolonging the provision of this limited resource otherwise threatened due to its misuse. Interestingly, Langemeyer et al. (2016) presented a contrasting view and emphasised that careful planning of land is a programmatic document allowing urban and rural construction and land management practices.

Careful land usage had been explained by Kite et al. (2016) as a process through which, piece of land is allocated and zoned to maintain a balance between residential, commercial, industrial, and farming and charity lots. It is this process that ensures that a properly developed city comes into being. Since the city's development depends on how productive its inhabitants are, being able to increase its revenues by allowing it to grow enough goods that it can then sell to other cities.

6.8 Summary of Key Discussion points

This shall become possible if the life of inhabitants is not punctuated by getting stuck in long traffic queues, dying on the way to the hospital, or lack of clean water and other utilities. Certainly, zoning can create chaos because residents either work in industries or commercial or agricultural areas to make their living; they send their kids to schools, colleges, or universities. Visit parks for recreation and go to hospitals for medical aid. So, if a city is well laid out, then traffic for schools can avoid clashing with transportation related to industrial and commercial centres. Similarly, residents returning from work to home shall also not be thwarted by the people visiting community lots or parks, thereby, allowing them to save time and instead use it more productively.

In contrast to a well-planned city developed without usage of proper tools, Brown, Sanders, and Reed (2018) concluded that such cities become a hub of chaos and violence as people would often feel irritated to travel due to fear of getting stuck in a traffic jam. As a result, their productivity at work would suffer, thereby affecting the cities revenues. In the absence of a plan, school traffic would clash with industrial and commercial traffic that would lose students from learning due to the already stressed-out brain. Loss of concentration in education can cause them to fail in understanding the concepts that are crucial for every technical field. Lack of knowledge shall make them incapable of dealing with the practical world, where they are supposed to deploy their learned skills and benefit the activity by taking it to a higher level. Furthermore, not being able to reach medical aid in time shall deteriorate the health of the residents, this shall also serve as a counterforce against their productive work thereby making them incapable of doing work and generating to the good of Qatar's economy.

The effect of sustainable land use was positively supported by the results of the descriptive analysis performed in chapter five of this dissertation. As per the analysis, respondents strongly agree with the positive effects being felt in the overall economy of Qatar due to a reduction in traffic congestion on the roads. Loss of fuel during massive traffic jams, medical bills as well as such sustainable development of land can also aid in cutting down the emissions into eco-system.

Chapter 7: Conclusion and Recommendations

7.1 Introduction

This chapter presents the outcomes of the research in a summarised and meaningful manner. The chapter will summarise the research methodology used for data collection and also discuss the findings obtained after performing data analysis. The discussion is made on all the observations obtained in this research and based on these observations; recommendations are shaped. Future research options will also be included, which can be used by other researchers in the future.

7.2 Research Contribution

7.2.1 Methodological Contribution

The mixed methodology is used in this research to make the research more reliable and authentic as the qualitative data allowed to make richer interpretations of the findings obtained from the quantitative data. To achieve the specific aims, the quantitative research methodology is utilised to discover measurable outcomes of the research as it allows the integration of reliable thoughts. Pragmatism philosophy was applied to produce empirical results of land utilisation framework in the Qatari public sector.

To gather quantitative data, the survey questionnaire was developed with close-ended questions related to land utilisation strategies and frameworks with different factors. The probabilistic sampling technique is used to select a group of people for the survey questionnaire, while non-probabilistic sampling is used to form up a group for obtaining data from interviews. Survey questionnaire data is accumulated with a sample size of 100 from which 50% of the respondents are employees of the public sector, whereas 50% of respondents are private-sector employees. The interviews were also conducted to examine the different perceptions of employees from both sectors regarding policy development of land utilisation.

For the analysis of quantitative data, the SPSS tool is used, which plays a significant role in the evaluation of regression analysis, correlation and descriptive statistics. While for qualitative analysis, the content analysis technique is used, and reliability analysis is performed using Cronbach Alpha. The special attention is provided towards the ethical considerations in this research by maintaining confidentiality, anonymity, and informed content.

From qualitative evaluation, it has been gathered that sustainable land management is a situation where land management of Qatar can sustain economic activity in the long-term. Respondents to the survey are of the view that the first step to achieving this development is possible if the government of Qatar. In this regard, responses to question one were meaningful, and respondents felt optimistic about the future of Qatar with better land management sustaining the Qatar economy in the long-term. However, in the middle of the rising population of Qatar.

7.2.2 Land Utilisation policies and sustainability in Qatar

Policies are a model because if applied, and then the results were checked regularly, could ensure that mismanagement of land is avoided. Moreover, the effects of economic activity on the climate could also be avoided. Responses to the strategic framework were meaningful, and the government can benefit from these to ensure continued compliance with policies related to sustainable land management. The government can introduce a licensing system whereby every landowner must be required to renew the license provided the applicant had submitted the report. The report must carry easy to understand facts and figures that are verifiable from an independent party. Not only such a framework shall ensure that policies related to land use are being complied practically. Besides, the method can also avoid Qatar as a whole reduce the impact on eco-system arising out of its economic activities being conducted on land.

Benefits of sustainable land management could be ensured once the channel had been established for the entire Qatari society to follow. In the absence of such direction as well as criteria required for fulfilling it can aid the reduction of climate change taking place in Qatar. Loss of land due to its efficiency being affected through dumping of hazardous toxic waste, directing chemical containing water through it and other instances, which, could stop if policy is applied. Meanwhile, checking the damage to lands' ecology as well as the atmosphere's pollution-related figures regularly and offering rebates to the activity performer. Or awarding penalties can aid the containment of pollution being increased and thereby allowing land usage to be supported in long-term. Responses regarding framework are supported by land reforms done in Qatar for attracting investment in the country. These land reforms not only attracted the FDI into the country, thus allowing the factories to be opened up for achieving a higher level of economic activity. Moreover, also aiding the incoming of the foreign graduated and experienced professionals, thus, allowing

the education of Qatar to be reformed. The enhancement of education system supported the generation of skills required for the happening of these activities.

Similar kind of reforms regarding land management could aid the expanding Qatari economy to survive in the long-term. Though commercial activity had been levelled, however, sustainable land management as regards to agricultural activity is required as is the need to direct the economic activity of Qatar for reduced ecological effect on the climate, through regular and surprise checks. The land reforms in the past had checked the bureaucracy in the government departments as the measurement of energy being used in the department is also counted in the pollution, causing a change in the Qatar climate. Thus, reducing these departments budget in the past had aided to contain economic activity through the use of energy in a sustainable manner.

Thus, from these responses, it is evident that in the past land reforms had brought increases into Qatar's economy; however; these reforms had not introduced checks and balance on ecological costs. As a result, at the expense of social losses, economic activity is being performed, which in short-term is brightening Qatar's commercial revenue. However, in the long-term, looming crises of climate change shortening the availability of land as well as expanding population facing a looming food crisis. Is threatening ever closer, because land once subjected to economic activity does not remain fit for the performance of the agricultural business for a long-time. As the company not only corrupts the fertility of the soil but besides, it drains off the underground sweet water, and the fresh water is essential for the survival of the crops. Unavailability of this resource can threaten the benefits of agricultural produce. This, in return, affects society as whole health that eventually impacts the productivity of Qatar's economic activity through health being threatened.

7.2.3 Contribution to the professional practice

Contribution to the professional practice can be seen from the responses of participants, which are showing how land-utilisation can affect the agricultural sector, construction firms, public and private sector companies that are involved in real-estate operations. Moreover, for crops growth, maintenance of the natural eco-system related to weather cycle is also crucial as crops require sun and rain at designated intervals. With unchecked economic activity comes the climate change due to pollution. This affects the natural weather system causing untimely rains and thereby destroying the crops due to the availability of excess water. Moreover, the changing weather cycle also causes

the extinction of non-human beings created for the upkeep of the vegetables. Although chemicals could be used to aid the survival of the crops, yet their side effects on human health cannot be ignored. Thus, with uncontrolled economic activity Qatar is exposed to the risk of innumerable losses that could not be rectified by any measures known to humankind. Therefore, it is better, effective and efficient to implement land reforms to direct the economic activity. Moreover, determine a structure that allows measurement of the effects of this economic activity on natural eco-system, the fertility of the land regularly. The structure shall aid the survival of earth supported commercial business of Qatar in the long-term.

The identification of these kinds of effects on society depicts the level of acceptance in the group of stakeholders linked with land management. The recognition of these factors shall allow the government to focus on creating the best land-related policies which are going to be implemented by these stakeholders. Implantation of the policies is going to be effective because stakeholders are ready to accept the governments' interference regarding sustainable land management. With the research, a major challenge of the Qatari government has been overcome because, during the application of policies, a major challenge is a reaction from concerned people. With this research, not only the possible kind of feedback on the implementation of policies had been unearthed. Besides, a framework following which these policies could be created had been laid out as well.

In the quantitative section of the research, descriptive and frequency analysis were used for converting the raw data into viewable information. Moreover, regression evaluation was also used to determine the strength of the relationship between dependent and independent variables. For this research, sustainable land development is an independent variable because its definition depends on every new level of efficiency is achieved. Efficiency is created through current land-related practices; therefore; it is a dependent variable because the impacts left by them shall enable the users to conclude. The correlation does not end here, and for the research, another set of links was used. The link is also related to land management in Qatar. Land development is an independent variable because it shall generate benefits to Qatar economy as a whole and these economic as well as health-related benefits shall be depending on land development.

Regression examination established that the government can direct the Qatari society through policies relating to sustainable land management, thus, channelling the Qatari society as a whole toward a better economy of Qatar. Through this analysis, it was established that a slight change in

the policies could cause a related change in benefits being gained from land practices. Since these benefits cannot be achieved in short-term because of their nature; therefore, it is better to choose a technique that is going to allow their measurement in the short-term. Based on findings, it can be said that policies is a shorter route and it is easy to compute the effects on Qatar economy left by them these policies could be changed as and when a new level of sustainable land development is born. Drafting of the policies is time-consuming; however, once established and applied, re-drafting them is not so tedious a job. This is because only the results about the path taken by the benefits from sustainable land development need to be controlled now through these changes being embedded into initial policies, these findings are crucial because the government is responsible for the upkeep of Qatar's future; this future is going to be bright. If natural resources, particularly the ones required for doing an economic activity including land, water and human resources, are kept safely and used wisely. The findings are also understandable because measurement of the pollutants being exhaled into the sky due to the type of business activity is not only causing visible damage to the land. Moreover, it is also causing loss of resources found within the land, underground water, minerals, wastes left by mammals and other living beings maybe not visible to the naked eye. Nevertheless, they are vital for land's survival in the long-term.

Since economic activity might create hazardous wastes which affect human health directly, exaggerating even more due to lack of land management from a communal point of view, moreover, health might be affected indirectly through harmful gasses being generated from the business activity, causing loss of fertility of the land. Agriculture depends on fertility and is very fragile, and the activity cannot be conducted unless the land is secure of all perilous kind of containment. Judging by the results of frequency scrutiny, respondents think so too. The world agriculture had been used by almost all the respondents if not all of them. It means that the fact is crucial, and it becomes even more so when it is realised that human activity is measured in terms of productive output. A type of production that had been created the first time correctly and truly benefited the target person, this is possible if people burnt out from work-related exhaustion. In case, they can find peace in the community-based park created at a short-walk distance to serve the exact purpose for people working in the offices on the entire block.

Merely sitting down and looking at trees gives the stressed person a feeling of satisfaction and feels motivated to work. Thus, the respite ensures that the rest of the day passes productively and

that person plays a role designated to him for levelling-up Qatar economy as a whole. The person, through his production work, had been able to generate for the economy higher than the cost paid for him by the Qatar economy. The productivity of the workforce also gets affected if the worker is not able to find a solution to his sickness because sustainable land management had not been spewed by the government to provide hospitals at-least on strategic points. Shortage of hospitals can not only generate overwork on the doctors, therefore, affecting the quality of their work and causing harm to the patients. Also, it can result in workers work inefficiency; the situation can climb higher and damage the Qatar economy through its inability to deliver value to foreign economies on time. Qatar being a major contributor to the global economy through the supply of oil and gas and other natural resources, stands to lose a great number of revenues if it is unable to deliver goods on time.

This technique is not sustainable land development in long-term because the economy of Qatar is paying the sick as well as a healthy human in equal amount. In the case of a deficient person, the amount is unsustainable since because the cost paid by the economy is not being recovered through efficient productivity. Though it is not workers fault; however, it is relevant because the circumstance arose due to a lack of management in land development. Management is affecting the benefits being earned by the Qatar economy through current land practices adopted by the government of Qatar. The health of the Qatar workforce in particular and society, in general, is also being affected by the consumption of a type of agriculture produce being grown in the economy. From the frequency analysis of responses, it is visible that stakeholders affected by land management are worried about the agricultural industry of Qatar being affected by the current land management. The current level of economic activity is supposed to damage the fertility of the land on which economic activity is being performed. Besides, the surrounding area as well, since toxins generated by some sorts of economic activity have a parasitic toxic nature; therefore, they damage the fertility of land forever.

Consumed pieces of land are consumed lost and could not be re-used for agricultural activity again. With improper land management, it is causing shrinking of land available for the agriculture industry in Qatar and the population of Qatar expanding due to the rise of economic activity level. A negative gap is being created that could only be filled in by proper sustainable land management.

Failing at policy's implementation might cause Qatar after long-term to feed the economy from sources bought from foreign markets.

Respondents to the survey also spoke highly about the requirement of mass-transit system required to reign in the climate changes being initiated by pollution. The pollution is also caused by individual relying on a privately owned vehicle rather than a well laid out mass-transport system. The system consists of trains, underground rail system, connected busses or trams and other modes that allow general society of Qatar to get from point A to point B in time. The objective of such a highly structured mass transport system is to make sure that Qatar society can reduce their social costs of transport on the Qatar economy by using the system provided by the government. The system also aids the reduction of fuel cost and loss of productive time wasted during traffic long-time spanned traffic jams. Respondents thought that ineffective transport system is the dual cost that is not adding to the benefit of land management to Qatar economy. Because people trying to get to their point of destination in a hurry are not using this system and are using the private mode of transport, their non-use of the system is cost. Because the system is meant to reduce private load and its failure to achieve that is an additional cost because its cost is not being generated based on the number of users. Rather the nature of its design, allowing it to carry a certain capacity at the simultaneous time.

The mass-transit is also meant for carrying loads of products being produced by Qatar economy as a whole. Private companies are always considered to manage their time efficiently, and their concern is to earn by delivering the value in time. This means that the ineffectiveness of the system is also generating traffic of privately owned trucks and carriers by the businesses; these are used to fill the void created by the current ineffective transit system. These trucks not only cause large traffic jams but waste time and energy of the other government departments, who should then spend time in controlling the traffic. Planning the roads to be laid out effectively is vital, as these roads are not built on a structure other than land. Thus, the ineffective mass-transit system generates another sort of land use that could otherwise be avoided. Besides, these roads must be maintained since goods produced are heavy and their transfer through trucks from one place to another point cave these roads in. Maintaining these roads regularly is an additional cost that is though generating benefits to Qatar. Nevertheless, these benefits are similar to those that could have been generated had the mass-transit system been well-planned. The responses, therefore,

agree that all these benefits could be achieved through clarification of policies related to land-use practices.

7.3 Research Recommendations

1. It is suggested that the drafting of procedures required for checking the activity related to land. As the nature of business being conducted in the surrounding area of land also leaves a lasting remark on connected pieces of land. While unconnected areas are often impacted by the climatic change being pulled through economic activity, with such policies, this kind of mismanagement of land could be controlled drastically.
2. Right now, the policies relating to the estate are focussing on giving Qatari's a better place to live in, no thought is being spared for development of the recreational areas. Also, future development is being ignored by not spawning policies related to agricultural pieces of land.
3. Moreover, it is suggested that the efficient utilisation of land should be done. One of the main issue faced by Qatar is the unavailability of land for crop production. Therefore, the limited land area available to farmers should be utilised efficiently. In this instance, the vertical farming concept can play a strong role, were more than double production of crops in contrast with traditional farming setups (Al-Chalabi, 2015). This is considered as one of the sustainable practice of land utilisation for crop production.
4. For the development of urban areas, it is suggested that projects should be assigned to public sector companies or groups of companies should be formed. These companies should first have to come up with city plans, where proper construction framework, traffic framework, Municipality designs should be formed up. These designs should encourage economic output as well. Therefore, office avenues and workplaces or commercial buildings should also be included (Rodriguez, Ürges-Vorsatz&Barau, 2018).
5. The design of urban areas must be kept sustainable. For this, it is suggested that recycling plants should be set up somewhere near the cities in a manner that fumes from the plant might not negatively affect the lives of individuals. In this way, waste management can be done effectively as waste can be conveniently transferred to these plants, where it can be recycled properly. In this way, landfills, waste or solid material creating pollution can be avoided.

6. Another important thing needed to be considered in the framework in greenings the surroundings of the urban area. The plantation of trees can be supportive to wash out impurities from the air, which cannot create air pollution.

7.4 Research limitations

This research, however, is subject to several limitations which are listed below,

- One of the major limitations of this research is the sample size, as the scope of the research is very wide and a questionnaire survey has to be done with participants including both public and private sectors of Qatar for which sample size of 100 is very limited to obtain the significant results. While the sample size used for an interview is also small as more sample size will help to generate different perceptions of people regarding land utilisation strategies.
- Lack of previous research studies on this topic is another limitation as to the past literature on land utilisation is mostly based on traditional strategies and it was very concise to the topic and did not discuss sustainable and latest land utilisation strategies specific to Qatar.
- Access to the respondents for data collection is also a limitation of this study as employees of both the public and private sectors of Qatar were not willing to participate voluntarily due to the lack of resources and time. Some of them also were not comfortable discussing the topic, which makes the interview process hard.

7.5 Scope for Further Research

The hierarchy introduced in this study offers options for future research. In this research, a deep discussion has been made on strategic framework development on different factors with a wide amount of literature specific to the Qatar public sector. However, researchers can utilise this research for further research on different regions for the development of land utilisation strategies as different areas, or countries have different rules and regulations regarding land use.

The limited sample size of this research opens the option for future research on the same topic as researchers can research by selecting the respondents from different stakeholders and companies involved in land utilisation. The literature available for this research is also very limited, and some of the researches are paid so future researchers with a greater budget can get access to more

authentic and reliable researches which will help to conclude the outcome of the selected topic with more authenticity.

The findings obtained from this research highlight the importance of renewing the land utilisation policies with the latest technologies and inventions for sustainable land development. Thus, further researches can be conducted based on this research for the development of land utilisation policies.

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