



UNIVERSITI PUTRA MALAYSIA

***PERCEPTIONS TOWARDS ROOFTOP GARDENS AS ALTERNATIVE
TO OPEN GREEN SPACES AMONG RESIDENTS IN
SULAYMANIYAH CITY, KURDISTAN***

LAMIA KARIM ABDULRAHMAN

FRSB 2014 22



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SULAYMANIYAH CITY, KURDISTAN**

By

LAMIA KARIM ABDULRAHMAN

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia
in fulfilment of the Requirements for Degree of Master of Science**

December 2014

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia
In fulfilment of the requirement for the Degree of Master of Science

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December 2014

Chair: Prof. LAr. Mustafa Kamal bin Mohd Shariff, Phd

Faculty: Design and Architecture

Rapid urban development has caused shortage of open green spaces in Sulaymaniyah, Iraq. This has created many problems to city residents and visitors such as lack of recreational spaces, formation of urban heat island and loss of tourism revenues. Creating new green spaces is not quite favourable due to the high cost of land in the city. Creating green areas on rooftops such as a rooftop garden is a potential alternative that requires investigation. This study aims to discover the views of public officials and residents of Sulaymaniye regarding developing rooftop gardens as a viable alternative to increase green open spaces in the city. This research surveyed 60 public city officials (architects, engineers, city planners and city administrators) on their awareness of rooftop gardens and their potential in increasing green open spaces. This was followed by a visual preference survey of 391 residents of Sulaymaniyah. Respondents were asked about their preferences for different forms (Formal, Informal, Naturalistic and Productive) of rooftop gardens as well as their willingness to support the development of rooftop gardens. Finally, in-depth interviews were done with 21 city officials to examine their views of rooftop gardens as a means to increase green outdoor spaces in the city. Results indicated that the majority of Sulaymaniyah public officials were aware of developing rooftop gardens as a strategy to overcome the lack of green outdoor spaces in Sulaymaniyah. In addition, city residents indicated that they preferred roof gardens as a strategy to overcome diminishing green open spaces in the city, and that they would support the initiative. Furthermore, the Informal Rooftop Garden type was the most preferred while the Productive Rooftop Garden type was the least preferred among the residents. The findings of this study may contribute to the discovering of solutions to the problem. This information is useful to the city planners and administrators as their knowledge on what the residents prefer for their rooftop gardens and the residents' willingness to support the effort will help them to make future plans or decisions in solving the problem.

Abstrak tesis yang dikemukakan kepada senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Master Sains

**TANGGAPAN TERHADAP TAMAN BUMBUNG SEBAGAI ALTERNATIF
RUANG TERBUKA HIJAU DIKALANGAN PENDUDUK BANDAR
SULAYMANIAH, KURDISTAN.**

Oleh

LAMIA KAREEM ABDULAHMAN

Disember 2014

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Pembangunan bandar yang pesat telah menyebabkan kekurangan ruang hijau di bandar Sulaimaniyah, Kurdistan, Iraq. Ini telah membawa banyak masalah kepada penduduk dan juga pelawat bandar tersebut. Ini termasuklah kekurangan ruang rekreasi, pembentukan pulau haba bandar (UHI), dan kehilangan potensi hasil pelancongan. Mewujudkan ruang hijau tambahan baharu bukan merupakan alternatif yang baik oleh kerana kos tinggi tanah dalam bandar berkenaan. Mewujudkan kawasan hijau atas bumbung bangunan seperti taman atas bumbung mempunyai alternatif berpotensi yang lebih baik tetapi memerlukan kajian lanjut.

Kajian ini bertujuan untuk menyelidik persepsi pegawai awam dan penduduk bandar Sulaymaniye terhadap pembangunan taman atas bumbung sebagai alternatif berdaya maju untuk menambah ruang hijau bandar. Dengan menggunakan kaedah kaji selidik, seramai 60 orang pegawai awam bandar (arkitek, jurutera, perancang bandar dan pentadbir bandar) telah ditanya mengenai kesedaran mereka terhadap taman atas bumbung dan potensinya dalam meningkatkan ruang hijau bandar. Kajian ini disusuli pula dengan satu kajian pemilihan visual melibatkan seramai 390 orang penduduk bandar Sulaimaniyah. Responden ditanya mengenai pilihan mereka terhadap jenis taman atas bumbung (Formal, Informal, Naturalistik, dan Produktif) yang digemari serta kesediaan mereka menyokong pembangunan taman atas bumbung. Akhirnya temu bual mendalam telah dilakukan dengan 21 orang pegawai awam bandar untuk menyelidiki pandangan mereka mengenai taman atas bumbung sebagai satu cara untuk meningkatkan ruang hijau dalam Bandar di Sulaymaniya.

Hasil kajian mendapati bahawa majoriti pegawai awam bandar Sulaymaniya sedar tentang potensi taman atas bumbung sebagai satu strategi untuk mengatasi kekurangan ruang hijau di bandar Sulaymaniye. Sementara itu penduduk bandar Sulaymaniye pula lebih suka taman atas bumbung sebagai satu strategi untuk mengatasi kekurangan ruang hijau bandar dan akan menyokong inisiatif meningkatkan pembangunan taman berkenaan. Penduduk juga menyatakan bahawa

mereka lebih suka taman atas bumbung Informal dan sangat kurang menyukai taman atas bumbung Produktif.

Hasil kajian ini menyumbang dalam mencari penyelesaian kepada masalah berkaitan dengan kekurangan ruang hijau bandar melalui pembangunan taman atas bumbung. Ia memberi maklumat berguna kepada perancang, dan pentadbir bandar Sulaimaniye mengenai apa yang penduduk gemari mengenai taman atas bumbung dan sokongan mereka terhadap pembangunan taman berkenaan.



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A lot of thanks to Sulaymayiah Urban Planning Department for providing me with a facilitate study leave, especially the director of Sulaymaniyah urban planning department Architect Tariq Nuri to help me to pursue this post-graduate study in landscape study.

I certify that a Thesis Examination Committee has met on 16 December 2014 to conduct the final examination of Lamia Karim Abdulrahman on her thesis entitled "Perceptions Towards Rooftop Gardens as Alternative to Open Green Spaces among Residents in Sulaymaniyah City, Kurdistan" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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LIST OF ABBREVIATIONS AND GLOSSARY OF TERMS

Q	Question
RQ	Research question
Main-RQ	Main-research question
Sub-RQ	Sub-research question
PW	Public's Willingness
RG	Rooftop garden
POA	Public Official Awareness
Perception	It is the cognition which is produced through a sense-organ coming into relation with an object. In addition, perception is the process by which organisms interpret and organize sensation to produce a meaningful experience of the world.
Awareness:	“It is the state or ability to perceive, to feel, or to be conscious of events, objects, or sensory patterns. In this level of consciousness, sense data can be confirmed by an observer without necessarily implying understanding. More broadly, it is the state or quality of being aware of something. In biological psychology, awareness is defined as a human's or an animal's perception and cognitive reaction to a condition or event”
Preferences	“In psychology, preferences could be conceived of as an individual's attitude towards a set of objects, typically reflected in an explicit decision-making process (Lichtenstein & Slovic, 2006). Alternatively, one could interpret the term “preference” to mean evaluative judgment in the sense of liking or disliking an object (e.g., Scherer, 2005) which is the most typical definition employed in psychology”.
Willingness	Is the quality or state of being willing; free choice or consent of the will; freedom from reluctance; readiness of the mind to do or forbear.

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

People move to larger cities for many reasons, and this has contributed to an increase in the number of urban population and urban extension all over the world. The growing urban population in many heavily populated cities creates many problems which include difficulty in managing waste, pollution, energy and etc. Development of new cities and expansion of existing ones have led to the extinction of global biodiversity. Furthermore, these have decreased the comfort, safety and advantages for urban residents as cities become more crowded, unhealthy and unattractive (Russ, 2004). However, it has been highlighted that green open spaces in the cities can contribute to improve urban living and sustainability (Hollis and Fulton, 2002).

Unfortunately, provision for green open spaces needs to compete with land allocated for urban development. Commercial developments usually overshadow the allocation for these open spaces. Nevertheless, as buildings grow taller, and cities become more saturated with development, there is a need to look for alternative spaces for open space development. Green open space developments above the ground such as on building rooftops have the potential to be developed into the much-needed open spaces in cities (Thompson, 2002). Therefore, different policies have been implemented at various cities with different densities and spatial scales in order to create and preserve a green outdoor environment. Numerous cities in the United States of America (USA), for instance, have created green belts, green networks and different programmes to protect green spaces (Gustanski and Squires 2000).

Increasing urbanisation and associated problems have also been discovered in the city of Sulaymaniyah. Thus, Sulaymaniyah was selected as the centre for this study. "Sulaymaniyah (or Slemani) is the capital of Sulaymaniyah Governorate and one of the cities in Kurdistan, Iraq. Sulaymaniyah is surrounded by Azmar Range, Goizha Range and Qaiwan Range in the Northeast, Baranan Mountain in the South and Tasluja Hills in the West. The city has a semi-arid climate which is very hot and dry in summer and is very cold in winter. Sulaymaniyah served as the historic capital of the Kurdish principality of Baban from 1784 to 1850" (<http://www.sulresidence.com>).

"The city is actually known as the "windy-city" in the region among Kurds. The modern city of Sulaymaniyah was founded in November 14, 1784 by a Kurdish prince, Ibrahim Pasha Baban who named it after his father, Sulaiman Pasha" (Ali & Meer, 2014). Since its establishment as the capital of a powerful Kurdish principality, Sulaymaniyah has rapidly developed into a large city with a current population of about 1.5 million people. It has become the cultural centre for the Sorani-speaking Kurds and an important economic centre for Iraqi Kurdistan (<http://en.wikipedia.org/wiki/Sulaymaniyah>). Due to the continuous increase in the population and urbanisation of the city, most of the trees in the mountains surrounding Sulaymaniyah have been cut down to create space for

building constructions. Furthermore, most of the land that was allocated for open spaces in the master plan has been used for commercial and residential buildings since 1991, after the city achieved its autonomy.

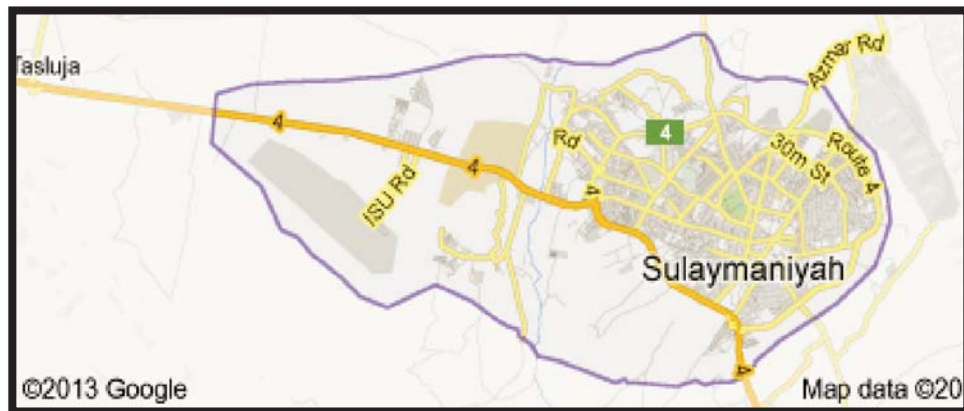


Figure 1.1: Map of Sulaymaniyah Source: Google Map

Images of some parts of Sulaymaniyah



Figure 1.2: View of Sulaymaniyah from the west
Source: <http://ds-lands.com/as-sulaymaniyah.html>



Figure 1.3: View of North of Sulaymaniyah
Source: <http://www.kurdsat.tv/>

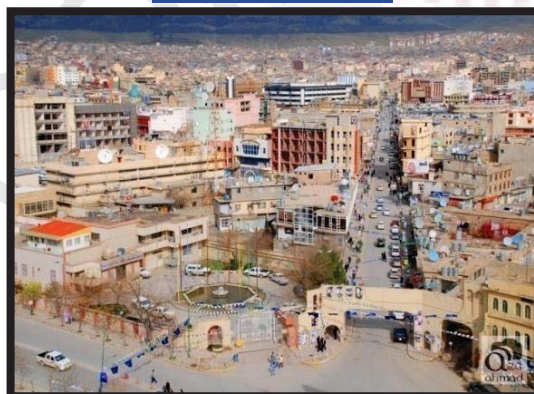


Figure 1.4: View of Sulaymaniyah city centre
Source: <http://ds-lands.com/as-sulaymaniyah.html>



Figure 1.5: View of the west of Sulaymaniyah.
Source: <http://www.kurdsat.tv/>

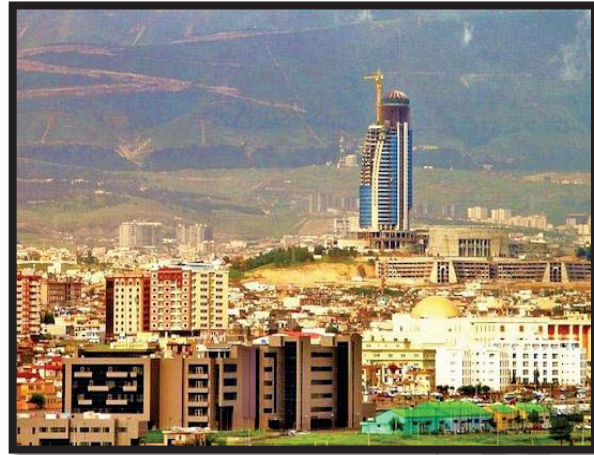
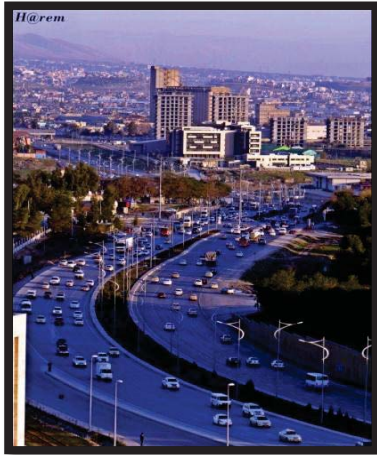


Figure 1.6: View of South of Sulaymaniyah city
Source: <http://www.kurdsat.tv/>

Sulaymaniyah is a city of four seasons; images below show the different scenery during the different seasons.



Figure 1.7: View of Sulaymaniyah in the Winter
Source: <http://www.kurdsat.tv/>

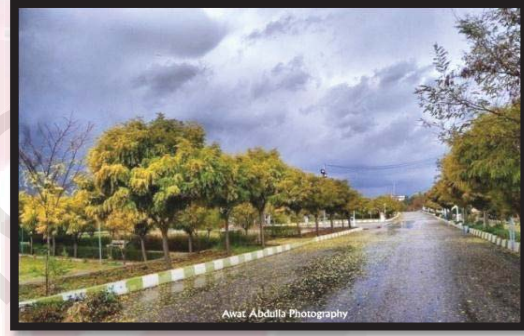


Figure 1.8: View of Sulaymaniyah in the Autumn
Source: <http://www.kurdsat.tv/>

1.2 Problem Statement

From 2000 to 2012, the number of residential areas in the city has increased from 27 to 162 (Niyaz, Directorate of Statistics 2012). This has created many issues related to extreme urbanisation; however, one of the most concerning issues is the rapid urban development which has caused a decrease in green outdoor (Bahroz, governor 2012). In addition, the increase in the price of land has made it quite difficult for city residents to find new land for constructing open spaces in the city centre. With new development, the proportion of green outdoor spaces is reduced each year as the population in the city increases.

The proportion of green outdoor gardens or trees inside Sulaymaniyah is currently at 8%, which is half of the global standard. The standard global allocation proportion for open green spaces in cities is generally set at 15% (Director of Gardens, 2012). Therefore, in order to comply with the global standard, the city has planned to

increase its green spaces by 2015 through the employment of various strategies. One of the strategies identified was the rooftop garden (Minister of Municipality and Tourism, 2012). However, before this strategy can be implemented, the acceptance of this idea by the public is crucial to ensure the success of the programme. Unfortunately, no study has been done to ascertain the opinion of city officials and residents about having rooftop gardens as a strategy to overcome the shortage of green spaces in the city. It was the aim of this study to investigate the awareness and perception of the residents and city officials in constructing rooftop gardens as a strategy to increase green spaces in the city of Sulaymaniyah. The results of this study will provide important information for policy makers and city planners in planning green spaces for the city.

1.3 Research Questions

The research questions of the study are:

Main RQ: What is the perception of the public in Sulaymaniyah in having rooftop gardens as an enhancement to green open spaces in the city?

Sub-RQ1: What is the level of awareness among Sulaymaniyah's public officials on rooftop gardens as a way to increase green spaces in the city?

Sub-RQ2: Do the residents of Sulaymaniyah prefer rooftop gardens and why?

Sub-RQ3: Which rooftop garden type and design are suitable for the city?

1.4 Research Goal

The aim of the study was to determine the awareness level and perception of Sulaymaniyah officials and residents in having rooftop gardens as a strategy to increase urban green spaces in the city.

1.5. Research Objectives

The objectives of this study are:

RO1: To examine the awareness level of Sulaymaniyah public officials of rooftop gardens as a means to increase green outdoor spaces in the city.

RO2: To determine the public preferences (like or dislike) for the different forms (Formal, Informal, Naturalistic and Productive) of rooftop gardens.

RO3: To investigate the willingness of Sulaymaniyah public in supporting rooftop Gardens.

1.6 Hypotheses of Study

The study has the following hypotheses:

- H1. Sulaymaniyah public officials are aware of having rooftop gardens as a strategy to overcome the lack of green outdoor spaces in Sulaymaniyah city.
- H2. The public of Sulaymaniyah city prefer all types of rooftop gardens as a strategy to enhance open green spaces in the city.
- H3. The public of Sulaymaniyah are willing to support the idea of using rooftop gardens as a way to enhance the green outdoor spaces in the city.

1.7 Assumptions

This study concentrates on proposing rooftop gardens on buildings as the best way to enhance open green spaces in Sulaymaniyah city. The study chooses public officials and academicians such as architects, city planners, engineers and city administrators from different universities and departments such as Sulaymaniyah University Halabja University, Koya University, Ministry of Municipality and Tourism, Directorate of Public Parks, the Mayor of Sulaymaniyah and the Urban Planning department including the private sectors. The public of all four parts of Sulaymaniyah, the North, South, East and West are selected to participate in the survey. The study is limited to the scope:

1. This study assumes that public official and academicians of Sulaymaniyah (architects, engineers, city planners and city administrators) have been exposed to what a rooftop garden is, and they are aware that having rooftop gardens is a good strategy to increase the open green spaces. Therefore, their perceptions of rooftop gardens do affect their willingness to implement them.
2. It was also assumed that public official and academicians of Sulaymaniyah (architects, engineers, city planners and city administrators) are concerned about the lack of open spaces in the city, and they may have the ability to influence the implementation of rooftop gardens to make these changes.

1.8 Significance of Study

This research is the first of its kind in the Iraqi Kurdistan that studies the green outdoor environment and rooftop gardens in Sulaymaniyah. It aims to provide information for architects, urban planners, engineers and city administrators on the usage of rooftop gardens so that they are well-informed of the benefits and use this strategy in their development choice.

The study also provides further understanding of the green outdoor environment and rooftop gardens to the previous research done on the same issue. This will help others to understand the planning of rooftop gardens and relevant policies, and their

implementation in different cities with different climates. Furthermore, this study provides recommendations to the officials (planners and policy makers) in Sulaymaniyah to form a Green Kurdistan Society, where the public will play a main role in realising it. In addition, the study provides information on the appropriate strategies that could be used by the residents of Sulaymaniyah to increase the awareness and willingness at all levels of the city. Thus, this study is particularly important for those researchers and practitioners in Kurdistan, Iraq. Finally, this research acts as the first step for other Kurdish researchers, scholars and students in dealing with similar problems occurring in Sulaymaniyah.

1.9 Organisation of thesis

Chapter 1 introduces the issues that have led to this study, the problem statement including knowledge gap, point of departure for this study, the research goal, research objectives, hypotheses, assumptions and limitations of the study and knowledge contribution.

Chapter 2 consists of a review of relevant literature based on important topics related to this study. It analyses the literature involved, summarises and discusses major contents in relation to this study.

Chapter 3 outlines the method used to gather and analyse the data. It shows in detail the data collection instrument used, the sampling design and size of respondents, and outlines the procedure for data collection as well as the measures adopted to control the reliability and validity of the data.

Chapter 4 analyses collected data. It provides the background knowledge of the problem and its influencing factors. This chapter is divided into two sections: the first section presents the results of quantitative data which were gathered from in-depth interviews with 21 public officials to identify their definition of rooftop gardens; to examine if rooftop gardens increase open green spaces; to identify their views on the importance of increasing open green spaces; to determine whether they are supporters of rooftop garden development in Kurdistan; to identify the challenges that arise in implementing rooftop gardens in Sulaymaniyah. The second section addresses the results of the qualitative data which was conducted through a visual preference questionnaire survey given to the Sulaymaniyah public and public officials. The survey showed different pictures of rooftop gardens to examine the awareness level of the public and officials of Sulaymaniyah, and to determine the public preferences (like or dislike) and willingness for the different forms (Formal, Informal, Naturalistic, and Productive) of rooftop gardens. 391 representatives from the public and 60 public officials participated in the survey.

Chapter 5 This chapter summarises and concludes the findings of the thesis. The findings provide recommendations to the residents and public officials of Sulaymaniyah. It ends with recommendations for future studies.

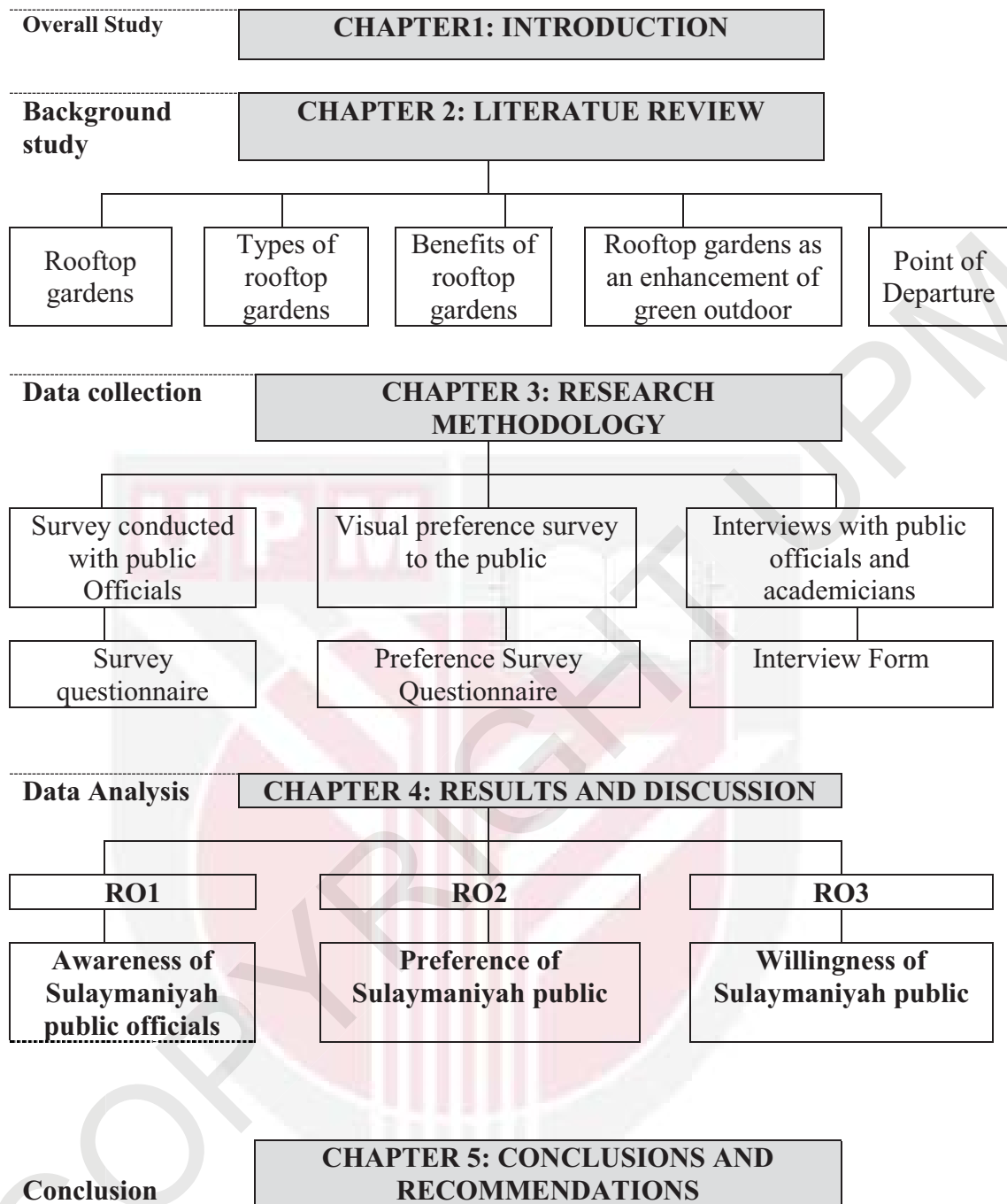


Figure 1.9: Research framework of this study

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