



**CARTOGRAPHY PORTFOLIO OF TOURIST ATTRACTION  
PLACES IN ERBIL GOVERNORATE USING  
GEOGRAPHICAL INFORMATION SYSTEM**

**Karwan Hama Saeed Hama SHAREEF**

**Master Thesis**

**Department of Soil Science and Plant Nutrition**

**Supervisor: Prof. Dr. Alaaddin YÜKSEL**

**2017**

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**REPUBLIC OF TURKEY  
BİNGÖL UNIVERSITY  
INSTITUTE OF SCIENCE**

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**Cartography portfolio of tourist attraction places in Erbil governorate  
using geographical information system.**

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**SOIL SCIENCE AND PLANT NUTRITION**

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## **PREFACE**

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**Karwan Hama Saeed Hama SHAREEF**

**Bingol 2017**

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## LIST OF SYMBOLS

CVA	: Change Vector Analysis
DEM	: Digital Elevation Models
ETM	: Enhanced Thematic Mapper
FCC	: False Colour Composite
GIS	: Geographic Information System
ID	: Image Differencing
LULC	: Land Use Land Cover
LULCC	: Land Use Land Cover Change
LZRB	: Little Zab River basin
ML	: Maximum Likelihood
MLC	: Maximum Likelihood Classification
MNDWI	: Modified Normalized Difference Water Index
NDMI	: Normalized Difference Moisture Index
NDVI	: Normalize Difference Vegetation Index
NDWI	: Normalize Difference Water Index
NDWI	: Normalized Difference Water Index, Modified
OLI	: Operational Land Imager
PCD	: Principal Component Differencing
RS	: Remote Sensing
TM	: Thematic Mapper
USGS	: United States Geological Service
UTM	: Universal Transverse Mercator
WGS	: World Geodetic System

# COĞRAFİ BİLGİ SİSTEMLERİNİ KULLANARAK ERBİL İLİNİN KARTOGRAFİK-TURİSTİK PORTFÖYÜNÜN BELİRLENMESİ

## ÖZET

Bu araştırmanın amacı, Turizm Genel Müdürlüğü ve Hawler Turizm Müdürlüğü'nün her ikisinden de elde edilen verilere dayanarak Erbil ilinin turistik yerlerinin haritalarını yapmaktır. Veriler, ilin turistik yerlerini ve turistler için önemli olan yerleri de içermektedir. Ayrıca CBS kullanılarak bu alanlara giden yolların Arcmap 10.3 ile haritaları oluşturulmuştur. Bu sistemin uygulanması, turistlerin hedeflerine daha kolay ulaşmalarını ve turizm otoritelerinin ekonomik kazanç sağlamasına yardımcı olacaktır. Elde edilen sonuçlar, Erbil'in turistik yerlerinin çoğunun, Erbil'in kuzey kesiminde Hasarost ve Zagros dağlarında yer aldığını göstermiştir. Bu tür turizm yerlerinin yüksekliğinin 3000 metreye ulaşması ve düşük hava sıcaklıklarına sahip olması, bu bölgeleri Ortadoğu'da önemli turizm alanları haline getirmektedir. Erbil'den Hacı Ömeran'a uzanan 180 km uzunluğundaki Hamilton Yolu gibi eski ana yollar Erbil şehrini turistik yerlere bağlamaktadır. Bu yol üzerinde Pirmam, Korre, Shaqlawa, Khalifan, Soran, Rawanduz, Gali Ali Bag, Choman ve Haji Omaran gibi ünlü turistik yerler vardır. Hamilton yolu çok eski, bir tarafı ve dar olup, sık sık trafik sıkışıklığına ve kalabalığa neden olmaktadır. Son olarak, ilin kuzey kesiminde çok önemli turizm yerleri mevcuttur: Halgurd Mountain, Hasan Bag Mountain, Sakran Mountain, Gomy Bekodian ve Przha gibi. Bunlar, Hamilton Ana Yolu'ndan on kilometre uzakta, yolu kötü, arazi yolu olarak kabul edilir ve bu yolda dört çekerli arabaya ihtiyaç duyulmaktadır.

**Anahtar Kelimeler:** Uzaktan algılama, CBS, değişim tespiti, sınıflandırma dijital elevasyon modeli (DEM).

# **CARTOGRAPHY PORTFOLIO OF TOURIST ATTRACTION PLACES IN ERBIL GOVERNORATE USING GEOGRAPHICAL INFORMATION SYSTEM**

## **ABSTRACT**

The purpose of this research was to make some maps based on the data that gathered from both; the general directorate of tourism and Hawler directorate of tourism. The data including touristic places and residential places for the tourists. Furthermore the roads and directions to those places using GIS and creating map with Arc map 10.3. Applying this system would help tourists to reach their destination much easier as well as helping the tourism authority of making economic profits. The results showed that most of Erbil tourist places were located in the northern part of Erbil province within Hasarost and Zagros mountain area. The elevations of such tourism places reach 3000 m.a.s.l, with low air temperatures makes these area an important tourism places in the Middle East. There are some old main roads connected Erbil city with the tourism places such as Hamilton Road from Erbil to Haji Omaran with 180km long. There are some famous tourism places on this road such as Pirmam, Korre, Shaqllawa, Khalifan, Soran, Rawanduz, Gali Ali Bag, Choman and Haji Omaran. The Hamilton road is very old, one side and narrow, and frequently causes traffic jam and crowd. Finally, There are some incredible tourism places in the northern part of the province such as Halgurd Mountain, Hasan Bag Mountain, Sakran Mountain, Gomy Bekodian and Prrzha located tenth of kilometers far from Hamilton Main Road and characterized by worse roads and considered as off-road and need four wheels cars.

**Keywords:** Remote sensing, GIS, change detection, DEM, accuracy assessment, landsat satellite, supervised classification.

## **1. INTRODUCTION**

Tourist cartography will much more combine to the technique of GIS, GPS and RS. The technical system will be established with the technique promotion of computer soft and hardware, in which it can realize the more combination of computer cartography and computer publication system. For tourist cartography and its product, it will further realize the popular and digital and marketable goal. At the same time, there will be more and mixed cartographic methods of tourist cartography which will enrich the cartography greatly.

To determine the potentials of tourism activities for a given area, a comprehensive land use planning via ground surveys, RS and GIS techniques are commonly required. Thus, a meaningful relation can be established among various tourism activities. Although tourism development cannot draw big fundamental capitals as compared with other tourism markets, it can preserve the natural resources involving local people in ecotourism activities (Khosravifard 2002).

As such, the potential for GIS applications in tourism is significant. GIS is now recognized widely as a valuable tool for managing, analyzing, and displaying large volumes of diverse data pertinent to many local and regional planning activities. Its use in environmental planning is rapidly increasing (Bualhamam 2009).

The amount of traveler maps disbursed in electronic approach has substantially accelerated attributable to increasingly more internet customers. internet has profoundly affected the developmental fashion of traveler cartography. The travelers are the usage of the traveler maps and get admission to them each other in a bran-new way. the ones traditional merchandise of maps might be meaningless in a way once they understand the alternating cartography thru net (Michael 2000).The correlative technologists in the realm of cartography should see certainly such developmental trend and have degree-headed cognition of it. They need to continuously eliminate the stale and convey forth the clean

technically and sell the technical improvement of traveller cartography by means of introducing superior community approach to traveler cartography.

It has been beyond the traditional cartography categories for modern tourist cartography Besides the technique of network, GPS, correlative technique of GIS and RS has more deep and extensive application in tourist cartography (Ke 2004).

Geographic Information Systems (GIS) and tourism share a common characteristic, that is, both cross the boundaries of disciplines and application areas. GIS has been applied in many disciplines including geography, forestry, urban planning, and environmental studies. Similarly, tourism has been a subject of interests to geographers, economists, business, environmental planners, anthropologists, and archaeologists (Wayne Giles 2003).

These criteria are individually considered to identify areas of opportunity (areas suitable to the land use under consideration) and constraints (areas not suitable to the land use under consideration). The main objectives of this study are: Protect and conserve cultural heritage and natural resources; Create new tourism opportunity; Promote ethnic diversity; and Facilitate equitable economic growth (Zopounidis Doumpos 2002).

One interesting effect is that hard ecotourists can unintentionally act as tourist pioneers who open these remote areas to more intensive and possibly more harmful levels and types of tourism activity, as per the exploration stage of Richard Butler's well-known destination life cycle model (Butler 1980).

Hard ecotourists, also unintentionally, can introduce diseases and weeds into these remote areas, such as the backpackers who have introduced alien bacteria into some remote water pools in Australia's Lamington National Park (Buckley et al. 1998).

The convergence of the International Year of Ecotourism with the International Year of Mountains provides an unusual opportunity to focus on the role of ecotourism in facilitating the economic, environmental and socio-cultural development of mountain regions, as well as other peripheral locations. My talk will focus on this topic of the relationship between ecotourism and development in mountain regions, and will be

divided into three main sections. First, I will make some observations about the definition and variable nature of ecotourism. Secondly, I will consider the potential environmental, economic and socio-cultural impacts, both positive and negative, of ecotourism. Lastly, I will tie this material together by discussing a planning and management framework that facilitates the role of ecotourism as an agent of development.

One critical commentary is that in mountain areas, ecotourism frequently happens as just one factor in a much wider tourism product that emphasizes journey tourism and cultural tourism, as well as ecotourism. Dr. David Fennell of Brock College in Canada (Fennell 1999) has coined the time period *ace* tourism that is, adventure tourism, cultural tourism, ecotourism to describe such products.

### **1.1. Aim and Objectives of The Study**

- To develop tourism with dignity, respect and nurture local cultures so that they enrich the tourism experience and build pride and confidence among local communities.
- To minimize environmental, economic, and negative social influences of mass tourism and promote sustainable tourism.
- To provide marketing, training, financial and mentoring support which foster the development of community-based tourism products.

## **2. LITERATURE REVIEWS**

The conception of traveler cartography has been transformed as a consequence due to the effect of marketplace economy within the cutting-edge statistics society (Chengwen 2000). Within the beyond, the visitor cartographers in particular considered the way to satisfy their work on time table as opposed to analyses the travelers' mentality of the way to use the vacationer maps they offered. The maps have become consciousness of interest within the cartographers' thought of tourist cartography at some point of the path of labor. Many cartographers unilaterally emphasized the preciseness and accuracy of visitor maps and seldom taken into consideration the vacationers' actual requirement and a few critical statistics correlative with showplaces because of the kingdom of traditional concept of tourism cartography in their brains. Such maps had been continually unmeaning and limited. The vacationers could only get little beneficial facts by using studying those visitor maps. It became difficult for those travelers to attract them to apply such visitor maps for now not fulfilling their actual requirements. It'd no longer only block the technical improvement of tourist cartography and bring terrible impact to the evolution of visitor market.

Geographic facts structures (GIS) and tourism percentage a commonplace characteristic, this is, each cross the boundaries of disciplines and alertness regions. GIS has been implemented in many disciplines together with geography, forestry, city making plans, and environmental research. Similarly, tourism has been a topic of pastimes to geographers, economists, commercial enterprise, environmental planners, anthropologists, and archaeologists (Wayne Giles 2003).

As such, the potential for GIS applications in tourism is significant. GIS is now recognized widely as a valuable tool for managing, analyzing, and displaying large volumes of diverse data pertinent to many local and regional planning activities. Its use in environmental planning is rapidly increasing (Bualhamam 2009).

Tourism is a pastime quite dependent on environmental resources. It is also a phenomenon, which within the occasion of a lack of planning and management is in all likelihood to erode its environmental base. As a result, the power of tourism planning can be enhanced by GIS applications. GIS may be perceived as presenting a toolbox of techniques and technology of extensive applicability to the achievement of sustainable tourism improvement. This paper will talk about the ability of GIS programs in tourism. Specially, it will spotlight the constraints of tourism-specific GIS programs. In an effort to compare the price and scope of GIS in tourism making plans and development, this paper will overview existing GIS programs which might be pertinent in tourism planning (Savigny and Wijeyaratne 1994); speak about a few methodological limitations in making use of GIS in tourism planning; and become aware of a few potential regions of applications in Hai An, Quang Nam province, Vietnam. Website suitability is a system which analyzes the desirability of viable places wherein a described use or interest can be carried out (Opadeyi and Nizeyimana 2005). Although it is usually not mentioned in regional development studies, the visitor is a key element of the development.

The visitor is the one who realizes the expenses in those destination areas and for whom the tourism infrastructure is built (Goeldner and Ritchie 2009). Hence, attendance in an area (its quantity and quality) is fundamental for the realization of the development potential of tourism within the destination area. All of the above-mentioned factors led the authors to opt for the identification of tourism development areas in its spatial meaning as the aim of this paper.

The main benefits come from the visitors' expenses in the tourist destinations, as well as investment in tourism infrastructure by businesses coming from the areas that generate tourists (Sharpley 2002).

With recognition to environmental affects, ecotourism is meant to foster caring and benign behavior at the part of practitioners and vacationers, so its consequences, theoretically, ought to all be fantastic. The emphasis in this environmental ethic, but, disguises the principle environmental gain of ecotourism in peripheral regions, that's its potential incentive fee in retaining natural resources that would otherwise be used in a much less benign way, along with with land being cleared for farming or animals hunted for food.



this incentive effect was tested several decades in the past in the blanketed regions of the African savannah, where the financial cost of an elephant herd or adult male lion as an ecotourism product became exponentially more than its price as a trophy animal or, worse, as a meals supply (Sherman and Dixon 1991).

The emphasis on this environmental ethic, however, disguises the main environmental benefit of ecotourism in peripheral areas, which is its potential incentive value in preserving natural resources that would otherwise be used in a less benign way, such as with land being cleared for farming or animals hunted for food. This incentive effect was demonstrated several decades ago in the protected areas of the African savannah, where the monetary value of an elephant herd or adult male lion as an ecotourism product was exponentially greater than its value as a trophy animal or, worse, as a food source (Sherman and Dixon 1991)

Eco tourists and hard eco tourists in particular, are said to seek out authentic experiences, and thus are more likely to produce a high multiplier effect because of their desire to consume 'authentic' local goods and services. However, this may be nothing more than wishful thinking by proponents of ecotourism. Dr. Kreg Lindberg, who is a leading ecotourism economist, estimates that around 90% of tourism revenue is lost through leakages such as imports and profit repatriation in most ecotourism destinations (Lindberg 1998).

There's a new definition (Michael 2000) for the traveller cartography because of internet with the popularization of internet and the enhancement of switch of pace of community. Net maps seemed which can be new styles of maps and feature extra chance in the software of digital traveller maps. Map facts may be stored in community servers and transmitted to the travelers with very speedy speed inside the internet maps. Tourists can browse and question traveler records and recognise the information at any moment and can query synoptic, dietetically, resident and traffic records by the method of hyperlink. Internet maps can grow more characteristic of get right of entry to every different between people and computer systems and show and distribute different sorts and intuitionistic contents of maps extra without problems. Net maps can also offer speedy methods and modes of getting tourist information to the tourists. At the identical time, net

maps can be updated with quite rapid speed and have enormously new contents, which could fulfill the vacationers and attract them to buy and use to exquisite extent.

With the great advance of modern technology, there is rapid development in the various realms of society. People standards of living have been enhanced greatly than ever. They have not simply satisfied daily basic necessities of life and have required higher demand of physical and culture content. Tourism has been popularized because people have more money and time to spend. Tourism has become an important component in the people spare time under this condition. When people go on a tour of tourist attraction, due to being in the strange environment they will face many problems, such as the position and distribution of showplaces or tourism routes along with the processing of contingency thing, etc. (Jingwei 2003).

It will plenty more loom massive than ever inside the more and more wealthy person budget visiting underneath above-mentioned circumstance. some kinds of tourism maps should be supplied to the various vacationers to be able to resolve those problems. therefore, traveler cartography has more and more acted as a more vital and lively role in the contemporary cartography methods and affected profoundly the holistic improvement of mapcartography.

The Internet is helping to redefine how maps are used. Maps are now delivered to the user in a fraction of the time required to distribute maps on paper allowing them to be viewed in a more timely fashion. Weather maps, for example, are posted on an hourly basis. Most importantly, maps on the Internet are more interactive. They are accessed through a hyperlinking structure that makes it possible to engage the map user on a higher-level than is possible with a map on paper. Finally, the Internet is making the distribution of cartographic animations possible. The Internet presents cartographers with a faster method of map distribution, different forms of mapping, and new areas of research (Peterson 1997).

Contemporary debate and research in cartography has stressed the role of the map reader in the process of cartographic communication, and cartographic experiments have been carried out to examine the cognitive processes involved in map interpretation. Some of

the issues raised by such studies are discussed with particular reference to how methods from recent psychological research can be applied to these cartographic studies. It is also emphasized that cognitive cartographic research needs to develop theories about cognitive processes which can be empirically tested, and it is suggested that one way to generate such theories is to adopt the approach and methodology of studies in Artificial Intelligence (Blades and Spencer 1986).



### 3. MATERIAL AND METHODS

#### 3.1. Study Area

Erbil it is one of the oldest continuously inhabited cities in the world and has an urban life that could be dated back to at least 6000 BC (UNESCO 2010). Erbil is one of the governorates of the north Iraq . The location of Erbil governorate is between latitudes  $35^{\circ} 30'$  and  $37^{\circ} 15' N$ , and longitudes  $43^{\circ} 22'$  and  $45^{\circ} 05' E$  and 136 -3609 m altitude . The Erbil border Extends to Iran in the East and to Turkey in the north. It is the third largest city in Iraq, as well as its fastest growing city. The plains in the south of Erbil governorate are important parts of the agricultural production.

Erbil Governorate is located between the two rivers known as the Greater Zab in the west and the Lesser zab in the east. The area of the Governorate is around 15074 km<sup>2</sup>. It consists of seven districts (Erbil, Makhmur, Koya, Shaqlawa, Choman, Soran, and Merqasur).

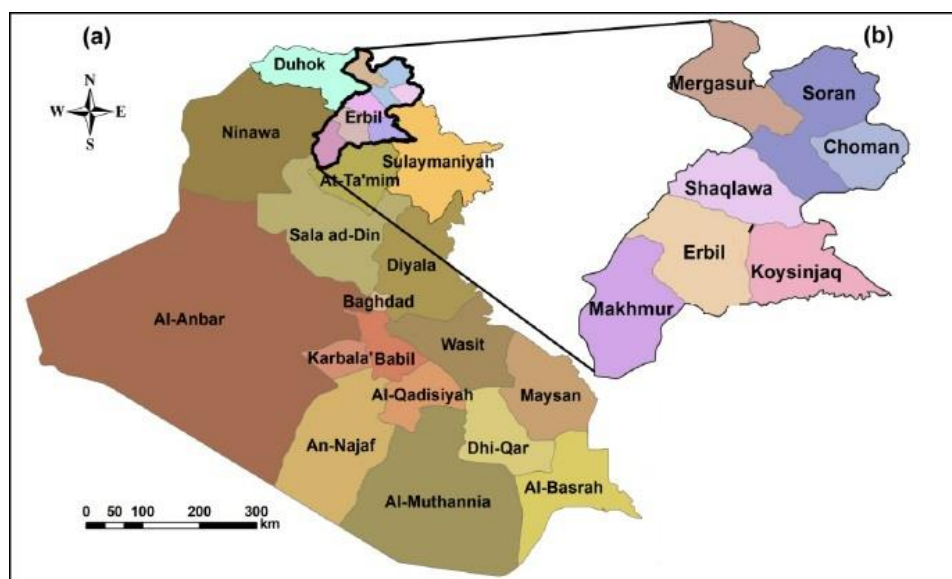


Figure 3.1. The location map of Erbil province

In Erbil Governorate 41% of the area is arable land and 59% is non-arable land. 93% of agricultural crops depend on rainfall and only 7% of the land is irrigated Erbil City, according to Köppen's climate classification system, is located in a transition climate zone between the Mediterranean climate (Csa) and the Arid climate (Bwh). The climate of the Erbil Governorate is comprised of cool and snowy winters and hot dry summers. The plains in the south have semi-arid climate conditions. Usually precipitation starts in October and ends in May. Erbil Governorate climate can be classified into two main.

### 3.2. Categories

1. Mediterranean climate region: this is in the north and northeast of Erbil governorate, this region is characterized by abundant rains between 600 and 800 mm per year.

2. Warm climate region of steppes: This region is located in the south and south-west of Erbil governorate. The average temperature is approximately 20.2 °C. Rainfall changes over the year. Rainy days are low in this region compared to the Mediterranean climate region. The rainfall is less than 543 mm per year, and therefore the winter agriculture is at risk of drought (Kahraman 2004).

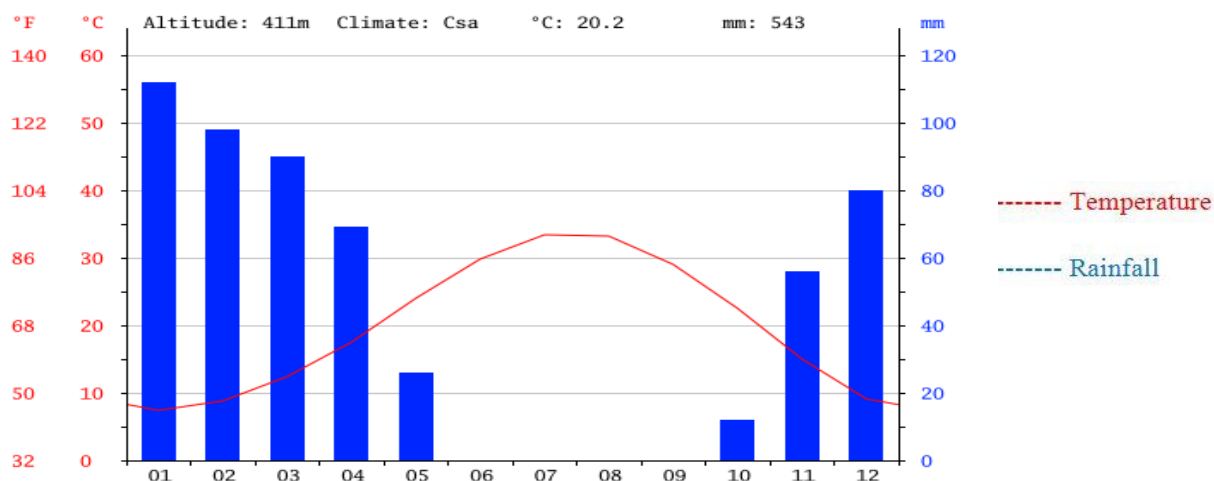


Figure 3.2. Calculated percentage rainfall and temperature in study area

The amounts rain and snow precipitation in Erbil are changing from year to year dependings on the, topographical differences. Changing amount of precipitationhas impacted the water levels in the rivers and springs. January is the coldest month of the year and July is the hottest month of the year (Heshmati 2009).

### 3.3. Slope

The slope is generated from a topographic ratio, which represents the ratio of the elevation difference between two points divided by the horizontal straight distance between the two points (Winnaar 2007). The slope is derived from the Digital Elevation Model (DEM), and classified into 5 slope percentage classes according to the FAO slope classification (Winnaar 2007).

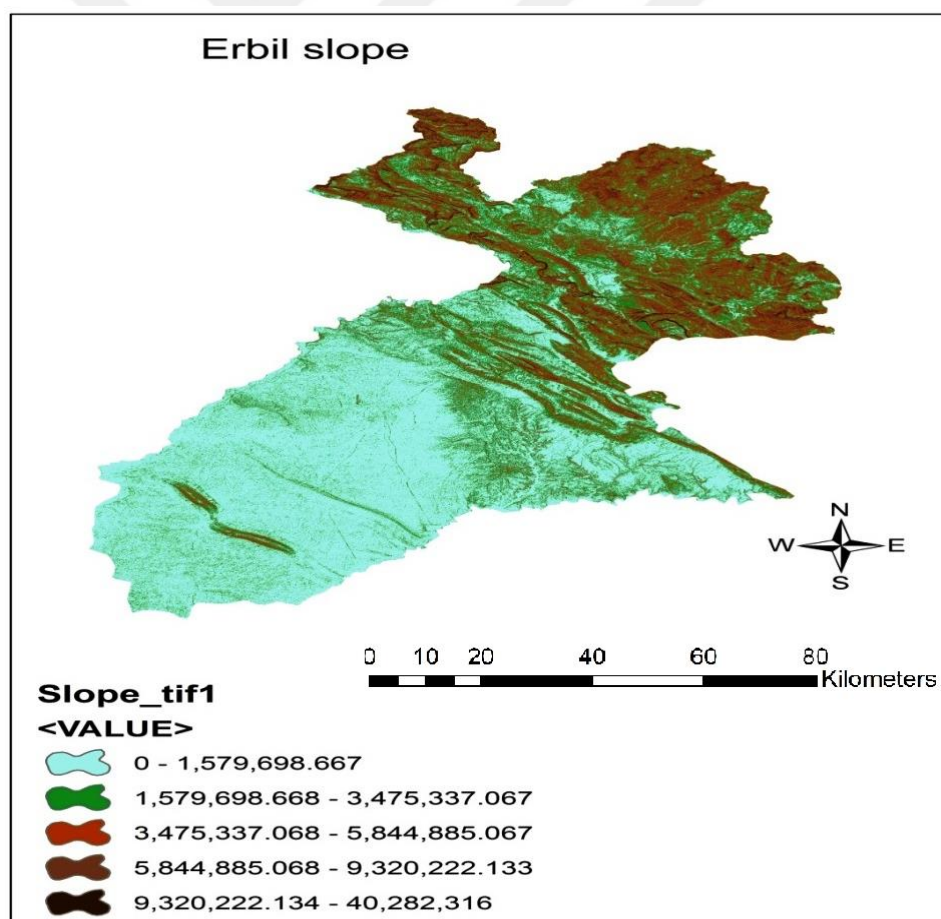


Figure 3.3. Slope map of the study area.

### 3.4. Mountains

All mountain in Iraq contain to north Iraq. Exactly in Erbil governorate such as (Halgurd- Qandil Safin - Zagros - Karux - Hasan bag – Bradost-Korak - Shirn - Hasarost . Awagrđ - Bawaje - Sakran - Hndreen - Zozk – and Argosh) Halgurd is the highest mountain in Iraq 3609 m above sea level.

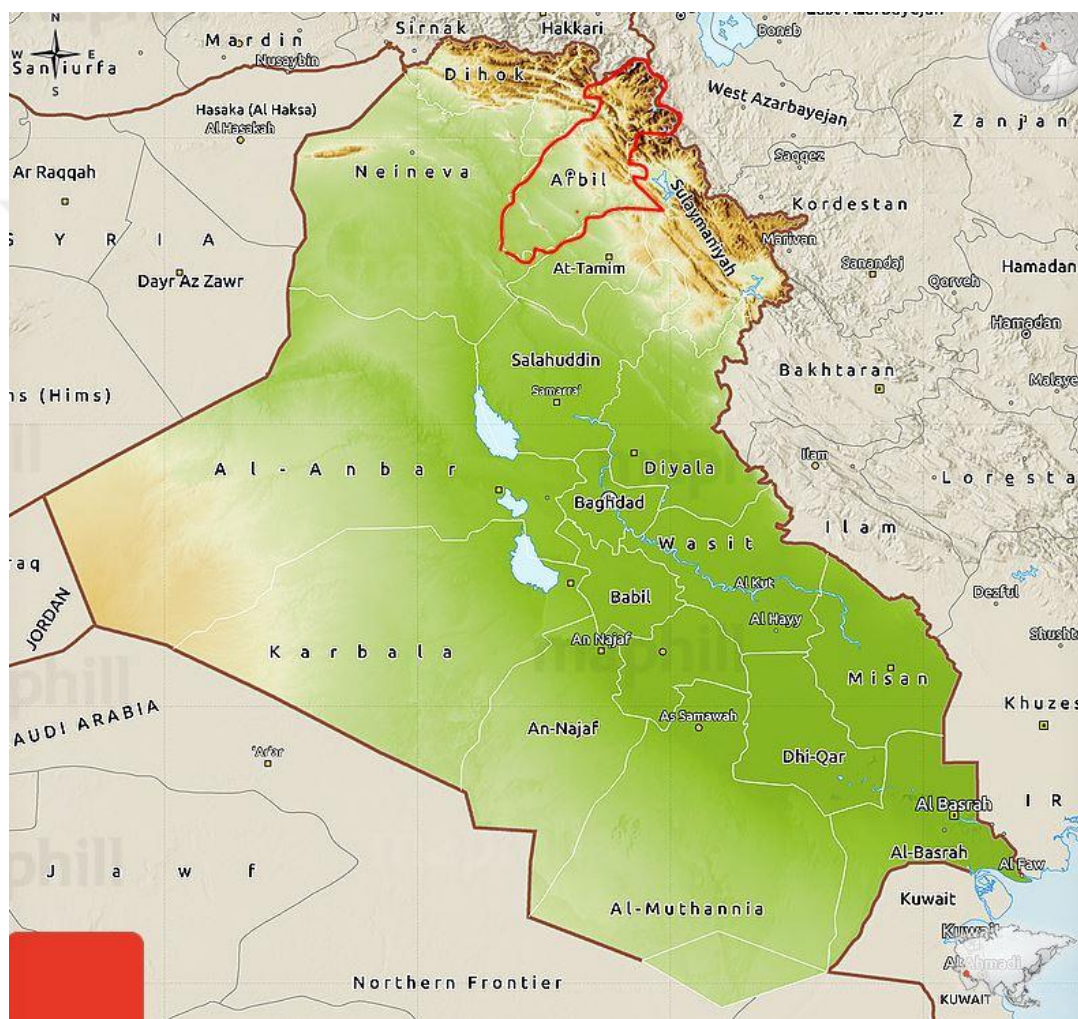


Figure 3.4. The mountain location of Erbil province

### 3.6.1 Software Used

ENVI version 5.2 and ArcGIS 10.3 were used to analyses images and guess the effects mapping. Microsoft excel can be shared statistical analyses goals for creating chart and info graphs.

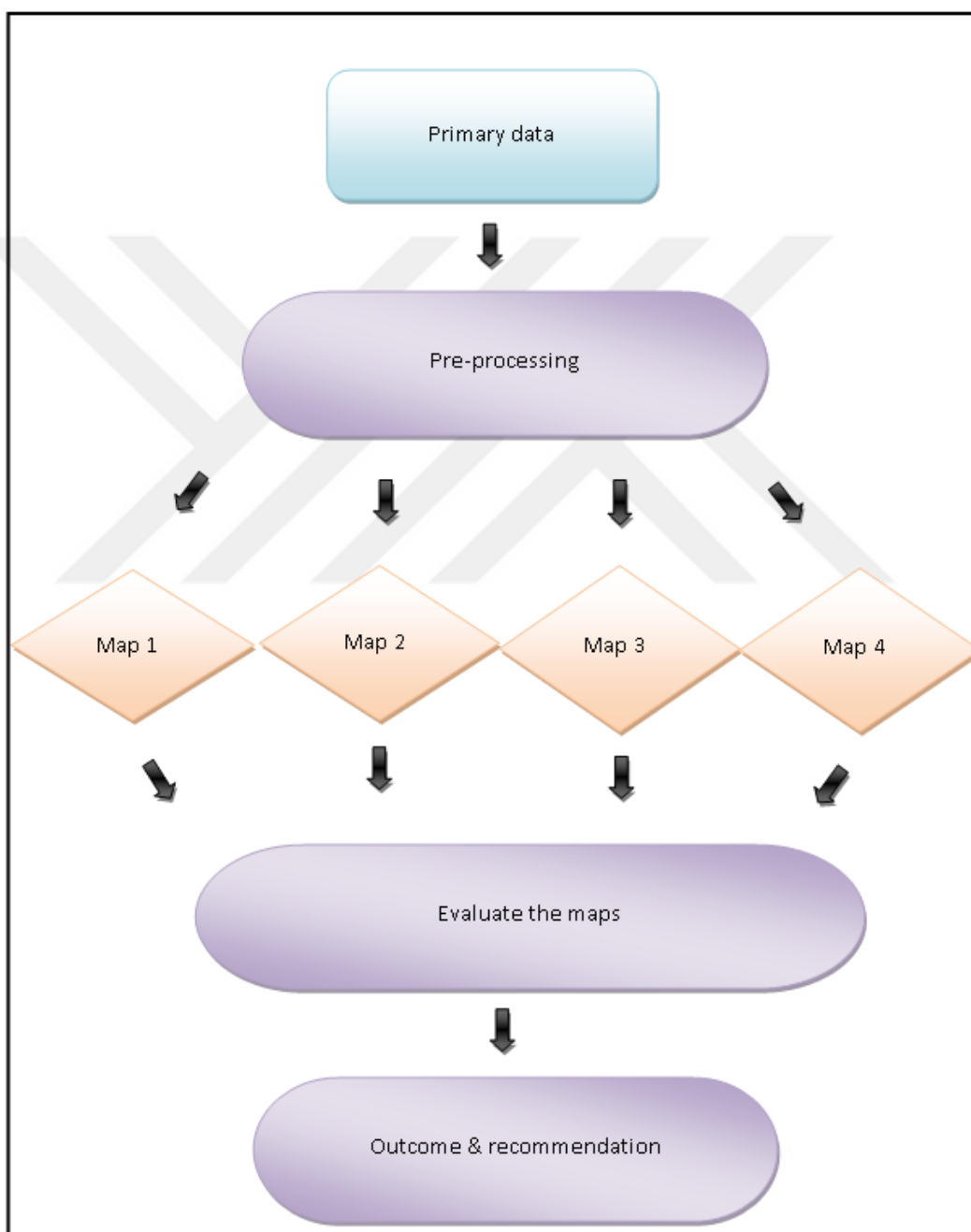


Figure 3.5. The flowchart of the study



### 3.6.2 Geographical Distribution of Eco-tourism Locations in the Erbil province

#### 3.6.2.1. Resort

##### Gali Ali Bag Resort

It is one of the most beautiful resorts in the area and in Erbil province, known for its' astonishing waterfall, located in a narrow valley which belongs to township of Khalifan. Also the resort is located in the west of Kani Maran resort on the main Hamilton Road which plays a significant role on tourism movement and its development. This Resort is 4.9 km away from center of Khalifan township, 8 km from Soran District, and 95 km from Erbil province. Located on longitude line 44 76 47 east and latitude 36 37 53 north. This resort is 579 m above the sea level.

This resort comes first among the resorts in the area. 26% of tourisms reported that the location is appropriate for Eco-tourism, and this resort is one of the most touring locations in the area. There are three restaurants in the resort (Brayate, Korek, and Shalal) and one Motel (Brayate) with place for car parking. Tourists can have rowboats in the waterfall pond in addition to several places to rest alongside the river which passes through the resort with trees on the riverbanks, birds and wild animals that attracts higher proportion of of the interest of tourists to the area which leads to an improvement in tourism sector.



Figure 3.6. Gali Ali Bag Resort

## Kani Maran Resort

This resort is located 1 km away on the east of the Gali Ali Bag Resort on the main Hamilton Road, and belongs to district of Dyana. This resort is famous by Kani Maran waterfalls and fabulous fountains which has a dramatic role in tourism attraction in the area. The resort is located 10 km, 7 km, and 96 km away from Dyana, Soran and Erbil respectively and lies on longitude 44 27 58 east line and horizontal circle 36 37 35 north and it is 543 meters above the sea level. There are only one restaurant and several places to rest around in the waterfall, and on the side of fountains there are six restaurants and five shops with few relaxing places in addition to other tourism facilities.

According to a study, enormous number of Iranian tourists have been visited in the resort due to suitability for passerby tourism. 12.3% of the tourists visited the resort reported the appropriateness of the location for tourism purpose and comes in the third place amongst resorts in the Soran district, and this has negative influence on tourism improvement in the area.



Figure 3.7. Kani Maran Resort

### **Hassan Bag Resort**

This resort is the highest in the area, and its 1804 m above the sea level, and located in a mountainous place which belongs to Dyana District and on the left side of the city. The resort is 24 km, 27 km and 128 km away from Dyana, Soran and Erbil cities respectively. And located on 44 37 41 eastern longitude 36 43 16 northern latitude. There are few fountains and natural springs surrounded by natural trees which attract tourists. According to the field study this resort come as fourth desired locations for tourism, and percentage of 8.7% of tourists reported the appropriateness of the location for tourism and people are desired to visit such places.

This resort is known for its moderate temperature which will not exceed 25°C in summer and that attracts enormous amount of tourists at the beginning of spring until the end of summer. This resort comes among the best resorts after mountain Korek for skiing because snow fall starts at winter and remains until the end of the spring and that is due to low temperature and the resort's height above the sea level.



Figure 3.8. Hassan Bag Resort

### **Malakan Resort**

This resort belongs to Khalifan district and located on the east of the district and north of Kure Tang resort, and its away from Khalifan city center by 29.1 km, 42.8 km from Soran and 113 km from Erbil province. Likewise, the resort is located on the longitude line 44 35 26 east and horizontal circle 36 27 43 north with 912 meters above the sea level. This resorts is features by its picturesque views with a temperature below 30 degrees in the summer and known for its natural springs, revers with trees alongside them in addition to beautiful wild animals made the resort one of the beautiful places in the area. Furthermore, 5.3% of research sample preferred this place for tourism purposes for its appropriateness for different tourism activities.



Figure 3.9. Malakan Resort

### **Kuri Tang Resort**

This resort is located in Alana Valley east of Kahlifan district and its height above the sea level reaches 797 meters. And located on the longitude line of 44 25 51 east and horizontal circle of 36 33 01. The resort is located 22 km away from Soran district and 94 km from Erbil province and its placed on the side of Alana river. The area is known for its moderate temperature which will not exceed 34 degrees in the summer because of its height above the sea level alongside with having a river in the place in addition to several natural springs and enormous amount of trees. There are many restaurants and shops in the resort. 4.4% of the research sample preferred the area for tourism purpose which has an influence of tourism improvement in the district.



Figure 3.10. Kuri Tang Resort

### **3.6.2.2. Tourists Lodges**

The term tourism lodge is defined as a piece of land which features by one or several natural, artificial, cultural or social tourism attractions in addition to various services needed by tourists (Danial 2010). Furthermore, tourist lodges are featured by desired and appropriate places for tourism activities especially mountainous lodges which are most visited by tourists. Therefore, the study area is suitable for these types of lodges which negatively affect the development of tourism in the district. The following are the mountainous lodges in the Soran district.

#### **Korek Touring Lodge**

This lodge is located on the northern side of Korek Mountain which is 2115 m in Khalifan district and its 1790 meters above the sea level. Its placed on longitude line 44 27 28 east and horizontal circle of 36 35 42 north. The lodge is 2.9 km away from Khalifan city center on Khalifan – Korek rout, 9.9 km on Khalifan – Bekhal road, the lodge is 17 km away from Soran district on Bekhal – Gali – Soran road, and 115 km away from Erbil province on Erbil – Khalifan – Korek road, also 109 km on Erbil – Khalifan – Bekhal and it's the biggest and the widest mountainous lodge in the area included in the study.

The lodge contains 37 apartments and 149 single rooms with ultimate modern services offered such as unique restaurant which provides various eastern and western dishes in addition to soups and grills. The lodge also includes party hall, Arabic room, VIP room, smoking room and classic room, Café and relaxation chairs, artificial springs and games for all ages. There are also a field for sport games, library, health center and car park etc. (www.thekorekmountain.com 2015). A tourist can enjoy playing various activities in the lodge such as chairlift, watching wild birds and animals, skiing, glider rides regardless of fresh air and breathtaking view, hiking, paragliding, mountain cycling, swimming in artificial pool, photography and walking in through the wonderful nature etc.

The results of the field study shows that the percentage of arrival tourists reaches 22.3% of the research sample and the lodge comes in the second place amongst touring places in

Soran district and this because of the tourists desire for the mountainous places and performing activities in such place in addition to modern services provided in the lodge.



Figure 3.11. Korek Touring Lodge

### **Zargali Touring Lodge**

This is one of the mountainous lodges in the area and located in a gorge from north of Khalifan. The lodge is 825 meters above the sea level with 2.9 km away from Khalifan center and 11, 93 km away from Soran and Erbil province respectively. Furthermore, the lodge is located on the longitude line of 44 42 80 east and horizontal circle of 36 62 91 north.

The space of the lodge is 3100 square meter (General directorate of tourism in Erbil 2015). Waterfalls of Zargali and Gali River are passing through the lodge with trees on the sides of the river. In addition, there are 10 motels, a restaurant, vast garden, car park, partying and wedding hall, relaxation places and a shop in the lodge. The outcomes of the study reported that the proportion of tourists visited the lodge is reached 4% of the

research sample, and this percentage is low comparing with Korek lodge and the cause belongs to the lack of the services, the size or space of the lodge and the shortage of relaxing places the lodge contains.



Figure 3.12. Zargali Touring Ledge

### **Bazhena Touring Lodge**

This lodge is located between Zargali lodge and Gali Ali Bag resort on the Hamilton main road. The height of the lodge above the sea level reaches 821 meters. The lodge is 3.4 km, 11.5 km and 93.5 km away from Khalifan, Soran and Erbil respectively. Furthermore, the lodge is placed on the longitude line of 44 43 11 east and horizontal circle of 36 62 76 north. There are several cafes and a Middle East restaurant, 6 apartments, one Tourism House in addition to other touring services. Tourists are visiting the lodge especially those Iranian people whom using land transportation which has a significant role on tourism attraction and improvement in the area.





Figure 3.13. Bazhena Touring Lodge

### 3.6.2.3 Promenades

Promenades are places visited by tourists for pleasure, relaxing and performing touring activities in addition to enjoying the nature with the appropriate weather and site for such activities. Soran district includes several promenades with wonderful nature includes natural plants, birds and wild animals which contributes in improving tourism in the area, and tourists are visiting such places mostly in spring. Usually they spend a day there and they will return to the nearer cities at night such as Erbil, Shaqlawa and Soran etc. because there are no tourism services in those promenades and there is no doubt that this must be taken care of. The following are the most famous promenades in the district:

### **Khalan Promenade**

This promenade is located in the Byawa Valley west side of the Khalan Village. The height of the promenade reaches 515 meters above the sea level. The place is located on the longitude line of 44 21 19 east and horizontal circle of 36 41 12 north. In addition, the promenade is 20.1 km, 34 km and 94 km away from Khalifan, Soran and Erbil province respectively. There are several natural plants in the area such as Oak, Walnut, pistacia atlantica, hawthorn, wild pear, wild figs, mulberry, raspberry etc. with existence of wracks and grass that afford the picturesque view especially in the spring and thus attracts the tourists to visit the promenade to have leisure time, performing touring activities, participating in national festivals such as Nawroz. Furthermore, the tourist are enjoying watching wild birds and animals while a river crosses the promenade gives it a wonderful view, also it is only 1 km away from Bestun Cave. At night, the tourists are return to the surrounded cities due to the lack of services in the promenade which forces the government to look after the it because its contributes in activating the tourism improvement in the area included in the study.



Figure 3.14. Khalan Promenade

### **Hanara Promenade**

This promenade is located in the west of Byawa Valley at the west of Hanara Xwaru Village. The height of the place above the sea level reaches 432 meters with 27.1 km, 41 km, and 96.5 km away from Khlifan, Soran and Erbil respectively. In addition, it is placed between the longitude line of 44 19 41 east and horizontal circle of 36 41 52 north. There are various kinds of birds and animals in the promenade with natural plants and most importantly the joining of both Rezan and Khalan rivers in it which gives a unique view of the place. These factors attract tourists to visit and do several touring activities in the area, but due to the lack of tourism services such as accommodation hotel and motel tourists are unable to remain at night in the promenade only a few whom brought a tent with themselves, the remaining must return to the both Soran and Shaqlawa. Therefore, government has to reconsider about placing touring services at all promenades located in the area included in the study.



Figure 3.15. Hanara Promenade

### **Gora Promenade**

This promenade is located 1 km away from Khalifan and at the west of Jolmerik Sarw Village. The place is 775 meters above the sea level, and its 13.9 km and 90.1 km away from Soran and Erbil respectively. In addition, the promenade is located on the longitude line of 44 24 43 east and horizontal circle of 36 35 45 north. The appropriateness of the place for school activities and national festivals makes tourists to visit it particularly in the spring because of the wonderful view and atmosphere for the touring activities and visitors will feel relaxed there. Likewise other promenades, this place also features natural plants, birds and animals, but visitors unable to stay there because of the lack of touring services provided which must be developed and shortages taken into account.



Figure 3.16. Gora Promenade

## Bradost Area

This area is located in the north of Erbil province 135 km away alongside the border of Iraq, Iran and Turkey. This area has historical importance due to the existence of both Kelashin and Tobzawa obelisks regardless of the existence of hundreds of historical places which belongs to impire 750-1300 BC, furthermore, in term of fountains and atmosphere, the Bradost area is known as a part of paradise on earth, with fresh water and mountain breezes which made the temperature not exceed the 28 degree in the summer, however, in the winter the temperature will reach -22 with the fall of snow throughout the season (Touring Guide of Soran Area 2014).

In addition, the area is the most preferred, because of mountain lakes and oasis such as Dindaran, Hasab and Sard lakes and Mir, Dukan, Shi, Khnzira, Hawni, Khelashin and Kni Khumar oasis which attracts enormous amount of visitors during summer. In addition, there are several valley in place for example, Sidakan, Berkm, Shakif, Khwakurk valleys with several high inclined mountains for instance, Barbazin, Shakif and Khwakurk etc. mountains which forms a wonderful and natural environment as a touring area.



Figure 3.17. Bradost Area

Table 3.1. Development of tourism motion in Erbil province from 2005 to 2016

<b>Year</b>	<b>Number of tourists –Erbil province</b>	<b>Increased percentage (%)</b>
<b>2005</b>	102450	-
<b>2006</b>	195934	91.2
<b>2007</b>	377397	92.6
<b>2008</b>	558860	48.1
<b>2009</b>	791345	41.6
<b>2010</b>	1313841	66
<b>2011</b>	1702390	29.6
<b>2012</b>	2217993	30.3
<b>2013</b>	2952027	33.1
<b>2014</b>	1229434	-58.3
<b>2015</b>	1008589	-69.2
<b>2016</b>	992398	-72.5
<b>Total</b>	11441671	-

Table 3.1 shows an increase in tourism rate visiting Erbil province, and the raise percentage started by 91.2% in 2006, then the proportion was slightly increased to 92.6% in 2007. In addition, the development in tourism belongs to government interest toward tourism projects and services, stability of political and security situation during 2005-2007. Surprisingly, the rate was dramatically decreased to 48.1% and 41.6% in 2008 and 2009 respectively. Then the percentage was raised to 66% in 2010 followed by a sharp fall which reached 29.6%, 30.3% and 33.1% in 2011, 2012 and 2013 respectively. Moreover, the proportion reached the lowest percentage -72.5% in 2016 and the reason belongs to the lack of security and political stability in the middle and south provinces in Iraq generally which has a negative effect on tourism rate in Erbil province, in addition to poor economic situation in the region because of the budget cut from the central government in Baghdad as well as due to the conflicts and wars occurred in Iraq and surrounded countries in 2016 which occurring until present day, all that have influenced all life aspects in the area regardless of various other causes.

Table 3.2. Development of tourism motion in North location from 2005 to 2016

<b>Year</b>	<b>Number of tourists</b>	<b>Increased percentage (%)</b>
<b>2005</b>	6100	-
<b>2006</b>	6300	3.3
<b>2007</b>	6500	3.2
<b>2008</b>	6900	6.1
<b>2009</b>	7300	5.8
<b>2010</b>	7500	2.7
<b>2011</b>	8000	6.7
<b>2012</b>	8935	11.7
<b>2012</b>	9882	10.6
<b>2014</b>	3188	-67.7
<b>2015</b>	2811	-71.5
<b>2016</b>	2919	69.4
<b>Total</b>	70605	-

The Table 3.2 illustrates the tourism motion in north location as well as the increased annual proportion of arrival tourists to the area included in the research which starts with the low percentage of only 3.3% in 2006, and 3.2% in 2007, then the rate gradually raised to 6.1% in 2008 followed by a decrease in 2009 with percentage of 5.8%. Moreover, the rate was 2.7%, 6.7%, 11.7% and 10.6% in 2010, 2011, 2012 and 2013 respectively.

As can be seen from the table, the annual increase for arrival tourists to the area is low comparing with Erbil province and the region at same years, and thus because of the following reasons: lack of tourism services in the majority of the area, in addition to the distance of the lodge from Soran city center and other provinces such as Erbil, while its located in north of Erbil governorate and on the international border of Iraq, Iran and Turkey. In addition, the lack of tourism projects in area except of the Korek mountain tourism lodge. However, the lowest percentage reached -69.7% in 2016 and this because of the mentioned causes above in Table 3.1 and for the same years.

## 4. RESULTS AND DISCUSSION

After creating the study area map, it has been found that the most of tourism areas in Erbil province are located in the north east which pointed in the Figure 4.1, and it's been found that there are more tourism places but because of the lack of services they cannot be visited. Moreover, the map also shows in all of the resorts and lodges there are no restaurants and resting facilities such as hotels and motels.

The field observations of the current study after visiting the different tourism places within Erbil province (Figure 4.1) showed that most of them located in the northern part of Arbil Province within Hasarost and Zagros mountain area. The elevations of such tourism places reach 3000 m.a.s.l, with low air temperatures makes these area an important tourism places in the Middle East.

In the middle part of Erbil province, include Erbil city, there are some beautiful and famous tourism places which attract tourists from other parts of Iraq and neighbor countries. These places include Parks and city games which makes Erbil city the Capital of tourism of Arabic countries in 2014.

The famous tourism places within Erbil province include the following:

1. In north and north east there are Gali Ali Bag, Bekhal, Haji Omaran, Rawanduz, Sakran, Soran, Dolli Akoian, Choman, Khalifan, Kani Maran, Chiay Korak and Chiay Hasan Bag. These places are far from the center of Erbil city from 100 to 200 km.
2. In middle part of the province which located within 30 to 60 km from the center of Erbil city. The tourism places include Hanara, Pirmam, Korre, Shaqllawa, Shekh Turab, Kosary Gashtiary, Chnarok, TaqTaq and Dolli Khoshnawaty.



3. In the center of Erbil city there are Samy Abdulrahman Perk, Shanader Perk, Minara Park, Komalgay Gashtiary Family Mall, Abu Shahab City, Komalgay Gashtiary Majidy Land and Aqua Tarin. These places located within Erbil city municipalities.

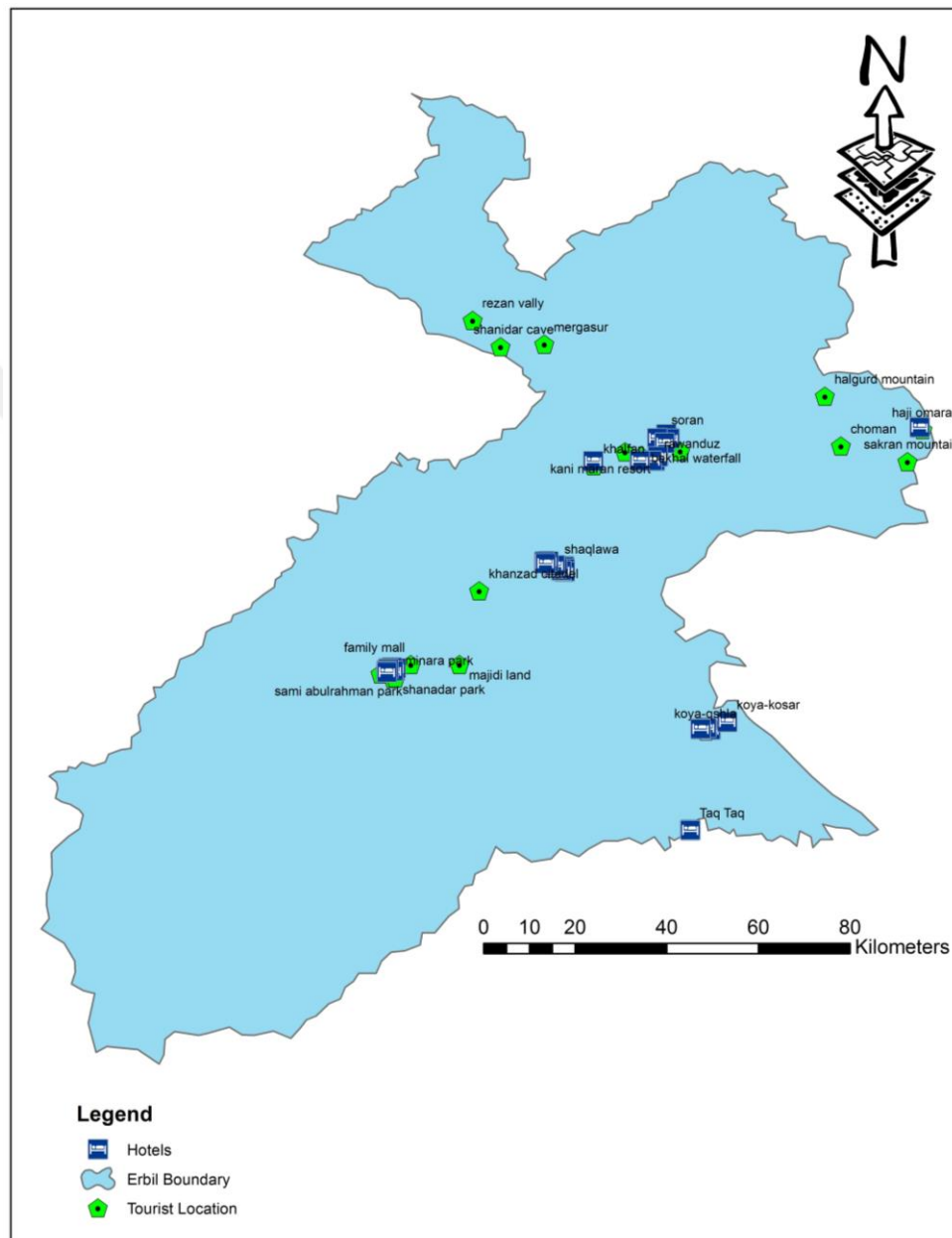


Figure 4.1. Hotels & Tourist location of Erbil province

This map shows the road of tourism places, the main roads and sub roads exists in the towns are not totally safe, as it shown in Figure 4.2, there are several places which have sub roads and this creates a barrier for tourist to visit all of the tourism lodges and resorts.

It was concluded from (Figure 4.2) and data obtained from Erbil Tourism Directorate that there are some old main roads connected Erbil city with the tourism places such as Hamilton Road from Erbil to Haji Omaran with 180km long. There are some famous tourism places on this road such as Pirmam, Korre, Shaqlawa, Khalifan, Soran, Rawanduz, Gali Ali Bag, Choman and Haji Omaran. The Hamilton road is very old, one side and narrow, and frequently causes traffic jam and crowd. On the other hand, there is a sub-road from Khalifan to Mergasor, Rezan, Shanadar, it is very old, one side and unsafe.

There is also a main road from Erbil to Sulaimani through Koya town, some tourism places such as Hawina Hawary Kosar and Chnarok on Haibat Sultan Mountain. The only two sides new road is the main road from Erbil city to Shaqlawa which connect Erbil city to Pirmam, Hanara, Bastorra, Shaqlawa.

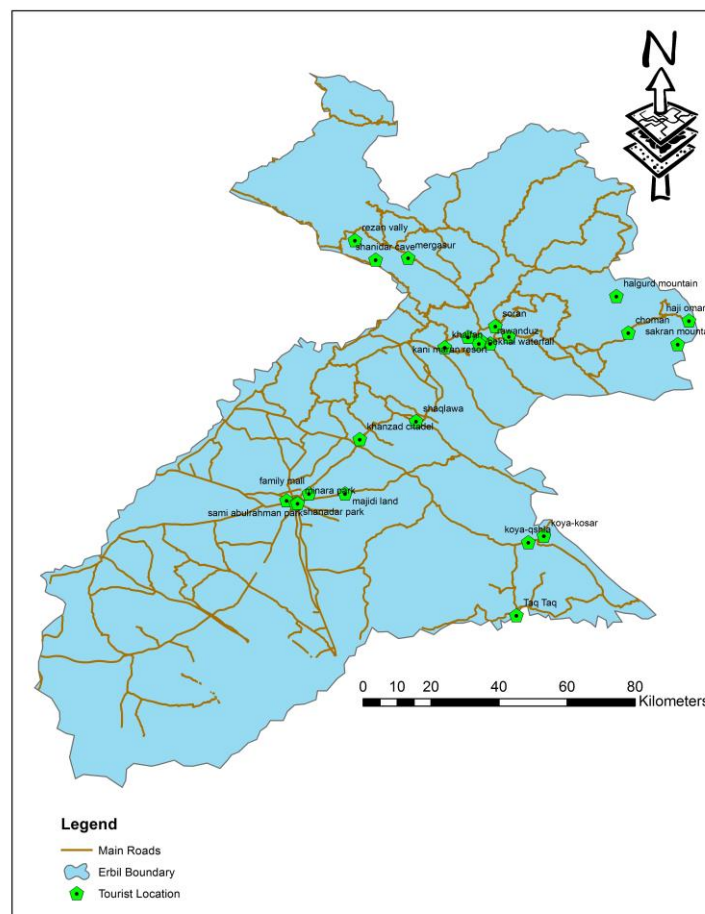


Figure 4.2. Tourist Location & Main Roads of Erbil province

There are some incredible tourism places in the northern part of the province such as Halgurd Mountain, Hasan Bag Mountain, Sakran Mountain, Gomy Bekodian and Przha located tenth of kilometers far from Hamilton Main Road and characterized by worse roads and considered as off-road and need four wheels cars.

In this map it can be seen that the hotels and resting places are only exist in the town and tourism places which are on the main roads and this influences on tourism accommodation as it shown in the Figure 4.3.

On one hand, the observations from field visiting and from Figure 4.3 revealed that there are insufficient Hotel, Motel and Restaurant services in the north and north east of Erbil province, especially in Sakran Mountain, Choman, Bekhal and Gali Ali Bag. On the other hand, there are few tourism places in the area such as Gulan Park in Soran, Komalgay Gashtyary Korak and Komalgay Gashtyary Haji Omaran characterized by good and modern tourism services which attract tourists to resident in 2500 m.a.s.l. with low air temperatures in summer season. In the middle part of the Province there are a lot of five star hotels and modern restaurants in tourism places such as Pirmam, Shaqlawa and Koya.

Finally, the center of Erbil city characterized by more big five star hotels such as Divan, Rotana, Erbil International, Dedeman and Canyon, and there are some big modern resturants such as Abu Shahab City, Samad Restaurant, Kabab Yasin, Dawa Restaurant and ABC Restaurant. There are also some big malls such as Family Mall, Majidy Mall, Royal Mall, Mega Mall and Tablo Mall which attract more tourists to Erbil city.

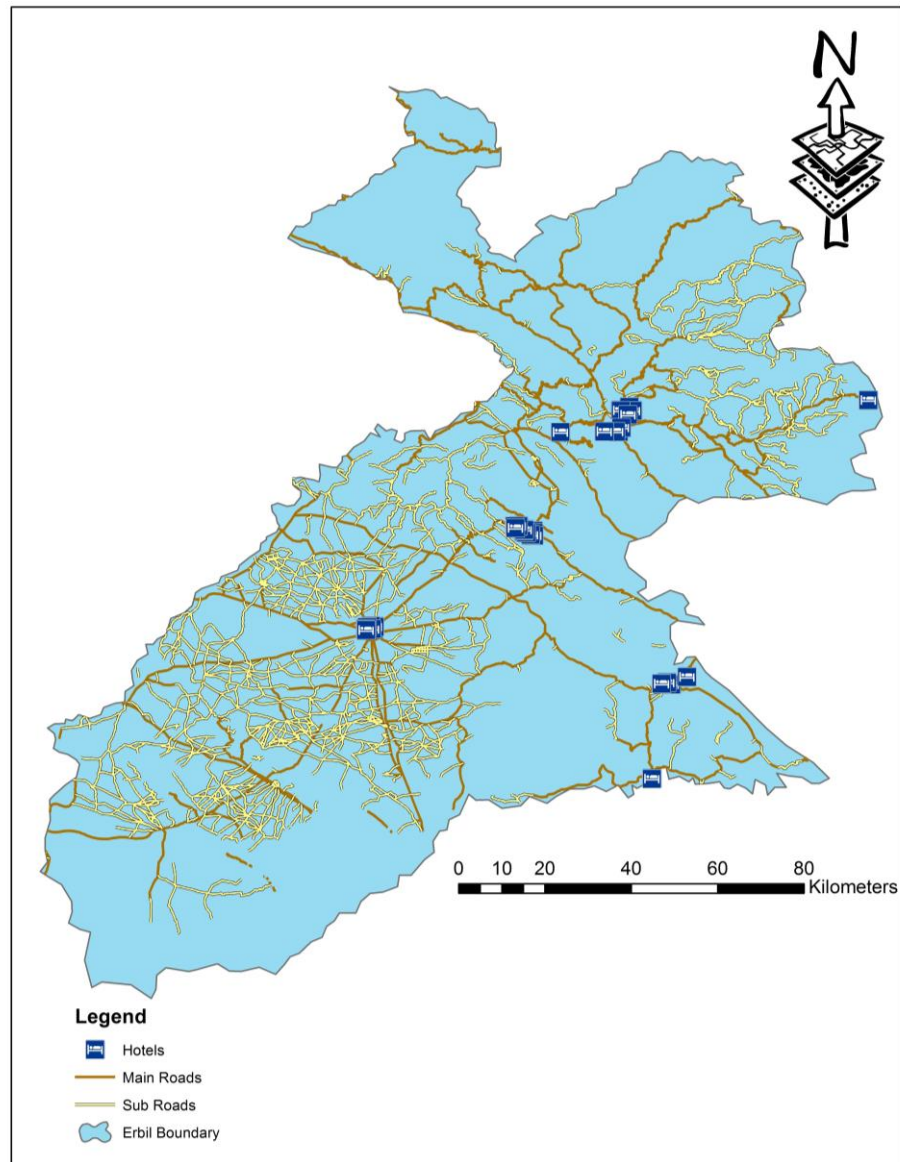


Figure 4.3. Hotels and roads of Erbil province

Main road and tourism map shows several resorts close to cities and towns have safe paths and roads, but there are still more resorts have no safe paths leading to them and because of that tourists cannot visit. Figure 4.4, illustrates more new tourism resorts near to cities and if safe ways are constructed toward them will lead to an increase in the number of tourism resorts and lodges and the number of tourist will raise and this will positively affect the tourism sector.

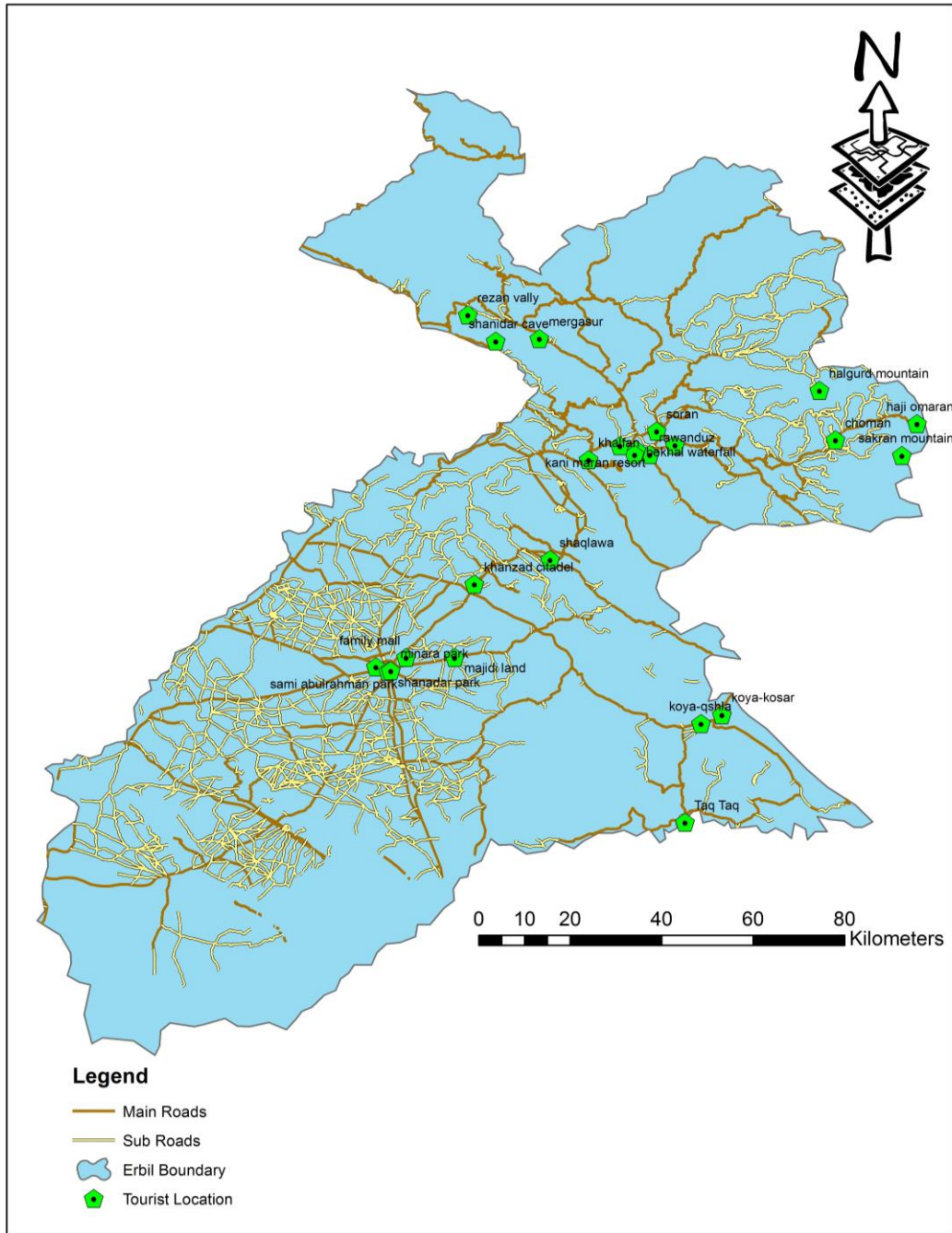


Figure 4.4. Tourist Location of Erbil province

Table 4.1. Area, yield, and wheat production in Erbil governorates for winter 2012-2016

	<b>District</b>	<b>Area/Donum</b>	<b>Yield Kg/Donum</b>	<b>Production/Ton</b>
<b>Erbil</b>	Erbil District	172,334.50	589.6	103,195.80
	Erbil Plain	174,700.50	452.5	84,597.20
	Khabat	96,153.00	544	45,774.70
	Koya	100,923.00	432.5	44,174.30
	Shaqlawaw	74,084.00	430.5	33,083.00
	Rawandoz	3,188.50	481.8	1,533.60
	Soran	8,647.00	491.5	4,260.10
	Mergasor	4,486.00	499.1	2,140.50
	Choman	2,312.00	456.6	1,096.70

According to data obtained from Ministry of planning, Erbil plain include the largest area for wheat production with 174700 donum, followed by Erbil district with 172334 donum, but the highest production amount was from Erbil district with 103195 tons, followed by Erbil plain with 84597 tons, then Koya district with 44174 tons.

It is worth to mention that, the famous tourism places were located in mountainous area, while in plains there are few places for tourism because of high air temperature, but it is the best places for wheat production.

Table 4.2. Area, yield, and barley production in Erbil governorates for winter 2012-2016

	<b>District</b>	<b>Area/Donum</b>	<b>Yield Kg/Donum</b>	<b>Production/Ton</b>
<b>Erbil</b>	District	Area/Donum	Yield Kg/Donum	Production/Ton
	Erbil District	36,792.50	419.1	14,257.50
	Erbil Plain	46,124.00	407.1	18,499.50
	Khabat	6,215.00	412.5	2,491.20
	Koya	29,024.00	474.4	13,726.90
	Shaqlawaw	12,559.50	272.9	3,377.00
	Rawandoz	1,507.50	461.5	697.5
	Soran	4,067.50	500.4	2,034.70
	Mergasor	413	488.3	198

On the other hand, Erbil plain include the largest area for barley production among other Erbil districts with 46124 donum and 18499 tons, followed by Erbil district with 36792 donum with 14257 tons, then Koya district with 13726 tons.

Table 4.3. The Number of Farmers Who Cultivated Summer Crops in Erbil Governorate for 2016

<b>District</b>	<b>Number of Farmers</b>	<b>Cultivated Areas / Donum</b>
<b>Erbil center</b>	1,007	17,490
<b>Erbil Plain</b>	361	6,462
<b>Khabat</b>	426	7,486
<b>Koya</b>	1,006	6,137
<b>Shaqlawa</b>	624	7,181
<b>Rawandoz</b>	147	235.5
<b>Soran</b>	387	4,008
<b>Mergasor</b>	765	1,515.
<b>Choman</b>	1,323	10,861

According to the data obtained from Ministry of Planning, among different districts within Erbil province, Erbil center district characterized by the highest cultivated area with 17490 donum, followed by Choman district with 19861 donum, then Shaqlawa district with 7181 donum. On the other hand, Choman district characterized by the highest farmer number with 1323 farmers. The cultivated area affects the climate of the area, and as a consequence affect the tourism nature of Erbil province, especially in Shaqlawa and Choman districts.

The agricultural area of Erbil province includes about 7791049 donum. Among them, about 2505120 donum are arable area, 2322580 donum fed by rain, and 1403999 donum are natural pasture. Whereas, irrigated, natural area, irrigated orchard, rain fed orchard and artificial pasture are totally composed of about 1500000 donum.

Table 4.4. Agricultural area in Erbil

<b>Land Nature</b>	<b>Area / Donum</b>
<b>Arable</b>	2505120
<b>Rain fed</b>	2322580
<b>Irrigated</b>	182540
<b>Artificial Area</b>	14500
<b>Natural Area</b>	1304369
<b>Irrigated Orchard</b>	22850
<b>Rain fed Orchard</b>	23780
<b>Natural Pasture</b>	1403999
<b>Artificial Pasture</b>	11311
<b>Total Area</b>	7791049

Table 4.5. Number of villages and summer crops farmers in Erbil governorate 2016

<b>District</b>	<b>Villages</b>	<b>Farmers</b>	<b>Planted area</b>
<b>Khabat</b>	34	361	6348
<b>Erbil plain</b>	66	468	3498
<b>Rawandoz</b>	33	297	461
<b>Soran</b>	102	724	2743
<b>Shaqlawa</b>	54	340	1788
<b>Choman</b>	164	1322	4838
<b>Koya</b>	75	759	4557
<b>Mergasor</b>	47	235	825
<b>Erbil center</b>	57	667	11497
<b>Total</b>	632	5173	36555

Generally, Erbil province includes 9 districts, 37 sub-districts, 632 villages and 5173 farmers. The highest number of villages and farmers were belongs to Choman district, followed by Soran district, then Koya and Erbil center district.

As mentioned before, Choman district include the most famous places for tourism in Erbil province such as Sakran, Haji Omaran, Hallgurd and Przha. Although, Choman district characterized the highest numbers of villages and farmers within the province. On



the other hand, the second famous place for tourism in Erbil province, i.e. Soran district, include the second highest number of villages and farmers within Erbil province.

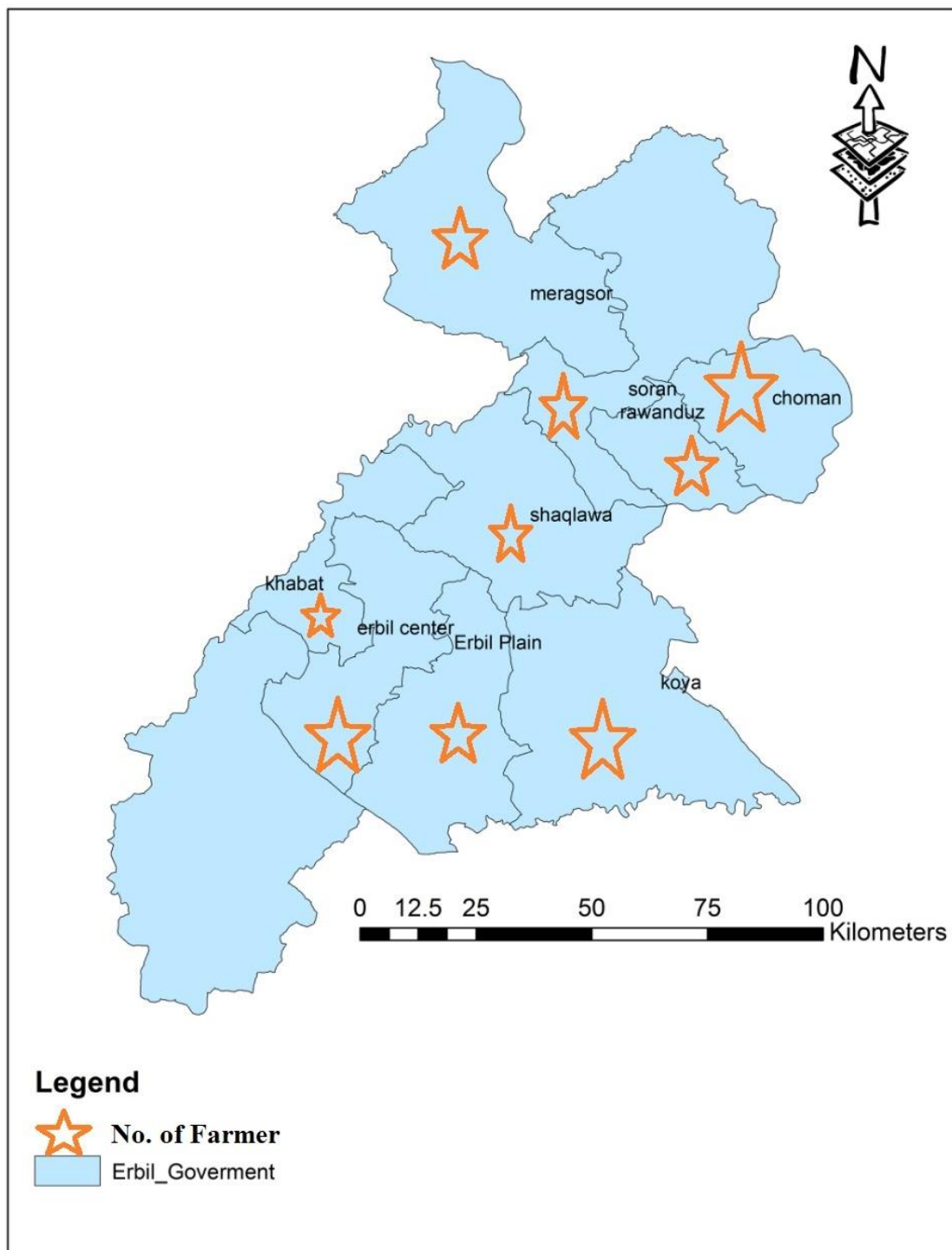


Figure 4.5. The Number of Farmers

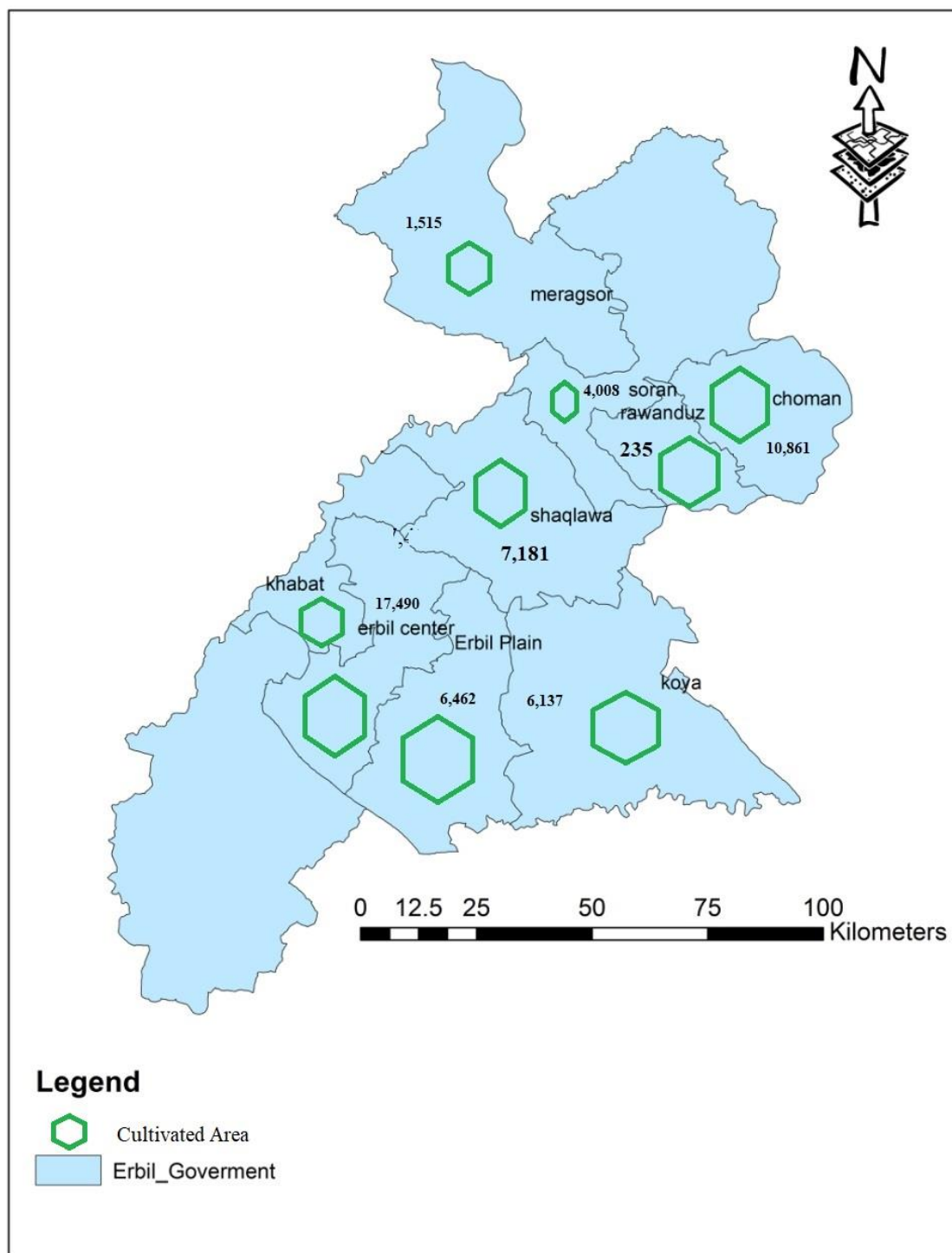


Figure 4.6. Cultivated Area

## **5. CONCLUSION**

During the studied period in Erbil tourism places, the following conclusions were noted:

1. The tourism places of Erbil province classified into North and North East, Middle of the Province and Center of Erbil City.
2. Most of the incredible and famous tourism places located far from Erbil City about 150 km, characterized by poor tourism services include bad roads, few hotel, motel and restaurants which affect negatively on number of tourists to these area.
3. Increasing number of professional hotels and restaurants.
4. Setting an electronic system for tourism resorts and lodges.

Thus will lead to an increase in the number of tourism which also vitalize privet sector and mixes foreign cultures with Kurdish culture.

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