A SOCIOLOGICAL STUDY EXPLORING INFLUENCE OF NATURAL FLORA ON LIVELIHOOD STRATEGIES OF RURAL COMMUNITIES (A CASE STUDY OF MARGALLA HILLS)

RESEARCHER
SAEED AKBAR
32-FSS/MSSOC/F09

SUPERVISOR
DR. SAIF ABBASI
ASSOCIATE PROFESSOR

DEPARTMENT OF SOCIOLOGY
FACULTY OF SOCIAL SCIENCES
INTERNATIONAL ISLAMIC UNIVERSITY
ISLAMABAD, PAKISTAN

2012

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Researcher

Saeed Akbar

Reg. No. 32-FSS/MSSOC/F09

Supervisor

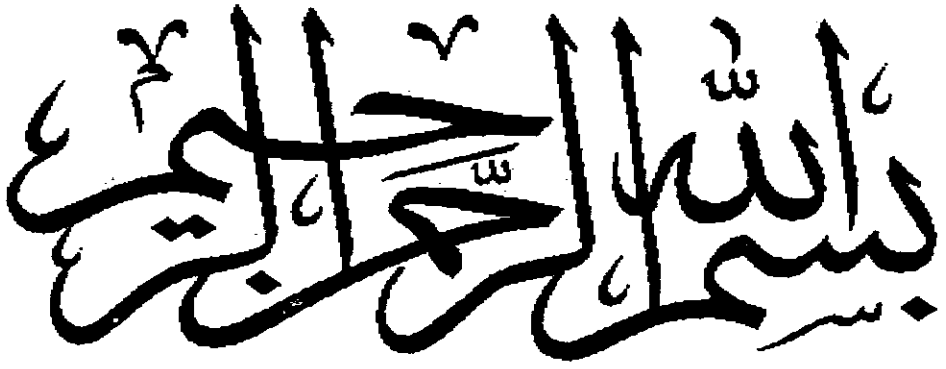
Dr. Saif Abbasi

A thesis submitted in partial fulfillment

of the requirements for the degree of

MS in Sociology

2012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INTERNATIONAL ISLAMIC UNIVERSITY, ISLAMABAD
FACULTY OF SOCIAL SCIENCES
DEPARTMENT OF SOCIOLOGY

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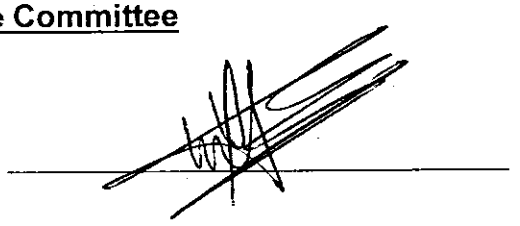
Supervisor:

Dr. Saif Abbasi

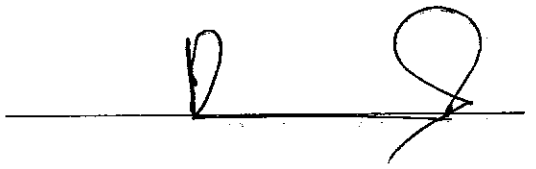


External Examiner:

Prof. Dr. M. Iqbal Zafar

Internal Examiner:

Mr. Akhlaq Ahmad

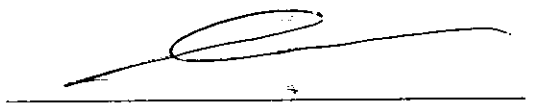


Head Department of Sociology:

Mr. Akhlaq Ahmad

Dean Faculty of Social Sciences:

Professor Dr. Nabi Bux Jumani



Dedicated

To

MY WIFE,

My Daughter

KHADEEJA,

&

My Son

ABDULLAH

(KHADEEJA AND ABDULLAH BOTH BORN DURING MY STUDY OF MS)

CONTENTS

LIST OF TABLES

CLASSIFYING NATURAL VEGETATION BY SCIENTIFIC AND VERNACULAR NAMES

S.No.	SCIENTIFIC/ ENGLISH NAME	VERNACULAR NAME
	MEDICINAL PLANTS	
i.	Mallouts Philippiensis	Kameela
ii.	Pistacia Chinesis	Kanga
iii.	Obea Ferruginea	Kao
iv.	Solanum Nigrum	Kuchmach
v.	*Centella Asiatica*	Brahmi Booti
vi.	*Punica Granatum*	Daruna
vii.	Euphorbia Heliscopia	Dhodal
viii.	Carissa Opaca	Granda
ix.	*Cassia Fistula*	Amaltas
x.	*Ricinus communis*	Arind
xi.	*Ficus benghalensis*	Bohr
xii.	*Justicia adhatodea*	Bhaikar
xiii.	Convolvulus Arvensis	Lehli
xiv.	Acacia Modesta	Phulai
xv.	Albizzia Lebbek	Shirin
xvi.	Berberis Lycemus	Sunmloo
xvii.	Mallouts Philippiensis	Kameela
xviii.	Pistacia Chinesis	Kanga
xix.	Obea Ferruginea	Kao
xx.	Solanum Nigrum	Kuchmach
xxi.	*Centella Asiatica*	Brahmi Booti
xxii.	**FARM IMPLEMENTS**	
i.	Wooden handles	*Kelay*
ii.	Wooden pegs	*Dastay*
iii.	Wooden rake (2 & 3 prongs)	*Trangal Sangal*
iv.	Wooden rake	*Pohra*
v.	Wooden plough	*Hull*
vi.	Yoke	*Punjali*
vii.	Wooden plank	*Majh*
viii.	Wooden spade	*Karai*
ix.	Wooden blade (leveler)	*Karah*
x.	Hand hoe for looping tree branches	*Dhanga*
xi.	Donkey cart	*Rahra*
xii.	Wooden coach box	*Jandri*
	DOMESTIC PRODUCTS	
i.	Wooden pen	Kalam
ii.	Sticks	Soti
iii.	Charpoy	Charpai
iv.	Wooden weaven stool	Piheri
v.	Basket	Tokra
vi.	Broom	Jahroo
vii.	Wooden ladder	Parsang
viii.	Wooden mesher	Gohtna
ix.	Wooden churner	Madhani
x.	Wooden churner's stand	Nihni
xi.	Wooden roof drain	Prenala
xii.	Table & Chair	Maize kursi

ACKNOWLEDGEMENTS

All praises for **ALLAH SUBHANUHU WA TALA.** No knowledge is hidden to **HIM** either past, present and future.

There be infinite bestowment and *Darood-o-Salam* upon **HOLY PROPHET MOHAMMAD (SALLALAHO ALIHE WA ALLIHI WASSALAM)** the last messenger of **ALLAH SUBHANUHU WA TALA.**

I express thanks and appreciation to my supervisor, Associate Professor Dr. Saif Abbasi, Department of Sociology, Islamic International University, Islamabad.

I also thanks to my students Naeem Adil, Shoukat, Tehseen, Irfan, Asim, Ihsan, Umair, for their help. I say thanks to my friends Umair Abdul Khaliq and Hafiz Abdur Rehman for their cooperation at different stages of work. I extend my heartiest and sincere gratitude to my parents who gives me the prayers, guidance, suggestions and moral and technical support. At last, Special thanks to Assistant Professor Mr. Akhlaq Ahmed, Head of Sociology Department, Islamic International University, Islamabad for his cooperation in academic as well as administrated help.

(SAEED AKBAR)

ABSTRACT

A socio-economic research was conducted at Margalla Hills. The area was selected due to its pristine beauty and ecological significance. There are 20 villages present in these Margalla Hills, which itself shows it's socio-economic importance. For the research, 10 villages (out of 20) were selected by random sampling. Eight villages (four for each) were located in districts of Islamabad and Haripur while two villages were located in Abbottabad district. Through proportionate random sampling, 354 households were selected in 10 villages by the help of voting list. The results revealed that the villagers have huge dependency on fuel wood, timber, fodder and forage and other direct and indirect products provided by natural vegetation in their domestic use. This results in the increase in income and decrease in monthly expenditures. There are very few tourist spots in study area providing limited tourism opportunities to the visitors coming from all over the country. This results in very low dependency of local community on such a profitable activity. Therefore, in order to preserve ecological integrity of the area and to provide employment opportunities to the villagers, various ecotourism related jobs should be provided by utilizing the ecotourism potential of the area. Moreover, the area is devoid of alternate energy options to fuel wood which leaves the villagers absolutely with no choice rather than to exploit and extract fuel wood. Therefore, alternate energy options should be provided to the area that includes biogas and solar energy. The study revealed that local communities of Margalla Hills are and will depend on natural vegetation to satiate their variety of domestic needs. This highlights the needs for finding alternative sources to sustain the symbiotic relationship of people and plants.

CHAPTER ONE

INTRODUCTION

Natural Resources such as air, water, soil, natural vegetation and wildlife have deep influence on the life of human beings. Since from the inception of human history, human beings remained dependent on natural resources to fulfill their basic requirements such as food, shelter and clothing. Rural communities, around the globe, highly depend upon natural resources to fulfill their socio-economic needs. Scientific studies have revealed that natural resources played a vital role in economic growth of a country. Different experiences of development during 19^{th} and first half of 20^{th} century have shown that natural resources are engine of socio-economic growth of a country. Natural capital can boost the economic development and accelerate the economy of a country (Behbudi, 2010).

Forests, particularly the natural ones, are the major source of natural resources containing variety of plants and associated wildlife species. These are the territories which not only conserve the nature in its pristine form but also help in maintaining the overall environment of a given area. Forests, being abode of the natural reserves for variety of goods and services such as trees, shrubs, grasses, medicinal herbs, natural fruits and edible flora, wildlife, water springs and aesthetics, provide a multitude of goods and services to the local communities thus ensuring their socio-economic well-being (Khan, 2006).

Pakistan, with its vast rural landscape, and rural communities possess a unique culture of old traditions and the local people have their traditional style and preference for a village site, house, family, dress, ornaments, cultural functions, festivals and socio-

cultural norms. Lack of effective communication networks have kept them closer to nature where they derive many of their day-to-day needs. The rural folks develop deeper observations of nature and possess indigenous knowledge about local plants that they have acquired through generations. These communities use natural vegetation as food and fodder, medicinal plants for human and veterinary treatment, timber products, oilseeds and many other products for their socio-religious and other purposes. Local people in villages gather indigenous medicinal plants in different seasons around the year for marketing as well as for personal use (Ahmed, 2003).

Amir (1992) mentioned that socio-economic value of trees and shrubs is very high having dual role as fuel and fodder. Their economic significance can be determined from the fact that they can provide year-round fodder for livestock. Moreover, being important component of the natural vegetation, they extend many other multiple advantages such as fuel wood timber for housing furniture and farm implements and leaves and shoots to feed domestic livestock. Furthermore, vegetation also provides enumerable environmental benefits. In three major continents of the world; Asia, Africa and Latin America, the use of trees and shrubs is common. In Middle East, livestock owners grase extensively their animals on shrubs and small trees.

In Pakistan principal land uses include agriculture, forestry and livestock production. Out of the total cultivated area of about five million hectares, 24% area is rain-fed (barani) while 16 million hector (76%) is irrigated land. About 60% of the entire area of the country is comprised of rangelands which support about 160 million heads of livestock. Natural forests are confined to only 4.5% of the country which yield only almost 0.3 million cubic meters timber and about 0.4 million cubic meters of fire wood (Mohammad, 1989). The shortfall of wood against the demand is met either from

farmlands or through import of wood and wood byproducts from other countries. In northern mountainous region of Pakistan, the major land use is forestry followed by crop cultivation. Livestock grazing is widespread in the forest areas. In Balochistan, about 97% of the area is comprised of rangelands and people primarily depend on the livestock production from its rangelands. Livestock is also an essential source of income in the arid and semi-arid areas of the provinces of Punjab and Sindh.

Local communities have their own distinct way of life, beliefs and traditions in Cholistan desert of Punjab and they have been using local plants for various purposes over generations. The plants of the deserts have great importance for local community such as forage, fruit and agricultural implements. Thus the natural vegetation plays a significant role in the socio-economic well-being of the desert communities (Shinwari, *et al.* 2002c).

Livestock is the main source of earning in remote areas in general and that of Margalla hills, in particular. This is easy and inherited profession for the people staying in different hilly areas of the country. Then role of women in this profession is worth mentioning for certain reasons. Rural women perform better in feeding the livestock, cleaning of their waste and offering informal care (Shafiq, 1988).

Forests are regarded as the super markets considering the extent of goods and services they provide for the society. Direct economics value is gained from food, constructional material, medicinal plants and other goods and services such as recreational benefits. Indirect economic value is achieved from different other environmental services such as regulation of climate, purifying water and, maintaining the fertility of soil. Aesthetic value is also a huge benefit of natural vegetation. Ethical values of plants are derived from belief which is acceptable in many cultures. The use of

non timber forest products is yet another benefit of natural vegetation. In this regard Martin (1995) argued that forests have immense economic values.

Wild plants were critically important for the survival of the hunting and gathering societies of the European settlers in North America. The people of the traditional communities cultivated wild plants to fulfill their basic requirements like food, medicines, fuel wood and timber etc. These forests also extend job opportunities for harvesting natural vegetation (William, 1990).

Traditional indigenous knowledge of mountainous society particularly that of culture and biodiversity management in relation to forest resources is one of the main issues in such areas as a source of sustainable development. Therefore, indigenous knowledge is not only important for cultures but also for the scientist striving to improve conditions in rural societies (Warren, 1990). People of the traditional communities, which are located in the vicinity of forest areas, use vegetation for different purposes. Some people use vegetation as a timber but most of them use vegetation for fuel wood. Some people of the local communities also use different medicinal species for making medicines for human and livestock diseases. However, the population of non-timber products is declining with the passage of time on few places due to excessive use (Salik, 2005).

In certain cases, the location of a particular site in a given landscape particularly in the vicinity of the natural vegetation is important for the local communities and also for the tourists for its scenic value. Such places attract visitors from all over the world to see and enjoy their beauty, which is mostly due to natural vegetation. Thus tourism in such areas plays an important role for the economic development of such regions (Mathieson and Wall, 1982). Tourism has both direct and indirect effects on the people of

local communities. It is most significant for the economic development which indirectly affects the culture and the environment (Farooq et al., 1995).

Local indigenous culture of hilly areas is always very fascinating. The protection of natural resources of local area under the umbrella of national park is obvious protection of the traditional culture of Margalla hills. Margalla hills include historical and archaeological sites within its boundaries. Little information of local culture is public because of the lack of the sociological research of the area and its people (CDA, 1980).

1.1 SIGNIFICANCE OF STUDY

Scientists of both natural and social sciences normally work in isolation. The scientists of basic sciences and those who are specialized in soil, water and agriculture consider that they can better observe, understand and explain the advantages of natural vegetation. The isolated approach proved to be a major hurdle in the better understanding of socio-economic benefits of natural vegetation for human beings in general and local communities, in particular. Social scientists, however, can better evaluate the socio-economic benefits of natural vegetation for mankind and teamwork of both natural and social scientists can even prove to be more beneficial in this regard. Through the current study an effort has been made to explore the socio-economic benefits of natural resources of selected forests with the focus on the following specific objectives.

1.2 OBJECTIVES

- To study the socio-economic characteristics of the respondents.
- To explore the livelihood strategies of the local communities.
- To examine the extent of socio-economic dependency of local communities on natural forests.
- To suggest the role of rural communities for conservation of forests of Margalla Hills.

1.3 HYPOTHESIS

1.3.1 There is a relationship between land ownership of the respondents and livestock rearing.

(a) More the landownership of the respondents' families more will be the livestock rearing.

1.3.2 There is an association between types of fuel used by respondents' families and household expenditure.

(a) Higher the use of natural vegetation as fuel, lower will be total household expenditure

CHAPTER TWO

REVIEW OF LITERATURE

Farnsworth (1985) conducted research on "Guides on the conservation of medicinal plants". The findings of the study are that the medicinal plants are used by the people of the local communities from centuries. Different traditional communities which are located around the forestry areas are using different plants for different purposes. Findings also showed that medicinal plants are most effective for the human beings in making medicines for different diseases both for human and livestock. The people of developing countries even 25% population of America are interested in usage of medicinal plants for various purposes.

Clark (1990) narrated in his report for Pakistan that the aim of forestry development project is to encourage the locals to grow more forest. As 90% of the timber came from private lands, it is important to control the eucalyptus supply as it exceeds the market requirements. There is also a need to evaluate more species for plantation timber and detailed studies on it. No communication channel exists between farmer and consumer of timber. Knowledge about eucalyptus and its usage is limited. In provincial forest department, there is a need to revise the sale policy. Lack of proper training for the farmer is also one of the major problems.

Miami (1990) mentioned that natural vegetation is most beautiful and adoptable natural resources providing simultaneously wide range of economic, social, sentimental and cultural benefits and services to human beings. Today global environmental amelioration natural vegetation represents a unique role preservation and suitable

development of all types of natural vegetation. The term environmentally sustainable economic development is more commonly recognized now-a-days as a sustainable development and has been globally populated by the report of the world commission on environmental and development. Production of industrial wood or fuel wood, the shielding of water sheds use as ecological reserves, wild life environment and reservoirs of biodiversity all are the major environmental advantages of natural surrounding for comfortable development.

Warren (1990) observed that local knowledge system of mountain culture and biodiversity management in relation to forest resources management is one of the main issues in hilly culture. As a source of agreeable development therefore, native knowledge system is not only of value for cultures from which they emerge, but also for scientist and the planners craving to ameliorate circumstances in rustic societies.

Hansen (1991) conducted a research with title "Monitoring Natural Vegetation in Southern Greenland". The research area of his research was Southern Greenland. The application of the Normalized Difference Vegetation Index (NDVI) for monitoring natural vegetation and biomass production has been evaluated for a sheep farming area in southern Greenland. The satellite-based monitoring has proved to be a useful tool to avoid overgrazing, which in this foehn-affected area easily implies soil erosion. It is a quick and low-cost method, and in combination with meteorological and soil water data, it is possible to forecast the dry biomass production at the beginning of each growing season. This facilitates agricultural management and planning of the potential breeding capacity in this vulnerable Marginal environment.

Soejarto (1993) conducted research in Switzerland. The finding of the study showed that according to the World Health Organization, the medicinal plants are decreased because of excessive use. People of traditional societies are more interested in using medicinal plants as compared to modern societies, that's why medicinal plants play a vital role in the life of local communities. Medicinal plants are almost finished on some places because the Government of Switzerland is not taking steps for the care of nature vegetation.

Qurushi (1993) mentioned that the range area of Pakistan is extremely in terms of soils, climates vegetation and productivity. Shortage in forage yield naturally resulted in reduction in livestock production. Potohar upland (districts of Islamabad, Rawalpindi and Chakwal etc) is a good instance of high potential range areas of Pakistan. Lavishing forage shrubs and grasses are more in this area along with quality. The grazers of Pakistan are not keen in proper range-livestock management and improvement. This is due to the traditional alienation of private ownership and less potential of some rangelands. Owning large livestock herds instead of quality of animals is the status symbol in many communities.

Gohar (1994) while studying the linkages of natural vegetation with the requirements of local communities of northern Pakistan mentioned in the recent past that people would grow non fruit woody biomass for timber, fuel and fodder on their lands marginal for crop production. However because of declining natural forests and linkage of villages with market through road networks, farmers have now commenced yielding forest trees on their farmlands for commercial purpose also. Depending upon the altitude trees like *poplars, Russian olive, black Locust, willows mulberry* and *ailanthus* are

frequently yielded on farmlands to supplement their cash income.

Khan and Zaidi (1994) observed that a variety of medicinal plants as "minor forest products" are growing in different parts of Pakistan. There are many rewarding products picked up from medicinal plants such as volatile oils, essential oils, tennis, sapofanins and gums etc. Huge amount of medicinal plants are only used as drugs but few species are also cultivated on the basis of their commercial significance and medicinal use. Export of medicinal is very low due to standard restrictions /limitation inflicted by advance countries.

UN (1994) noticed that livestock are an essential source of protein for human being. The present livestock rearing system and practices in the territory are less productive and inefficient due to less heed on livestock feeding, breeding and health. At present stuff resource for livestock incorporate pastures and grassland, communal grazing land, wayside grazing forage trees and shrubs, crops, oil seeds, non-conventional by products of agro industrial processing user and animal and poultry industry by products.

Dove (1995) postulated the human-ecological role of forestry of farm in Pakistan based on a study carried out in 113 villages of Barani (rain fed) districts of the country including Chakwal. The study focused such villages as were situated 2.4 miles away from the paved roads. Researcher mentioned that the waste lands in rural areas are generally such areas, as which are not cultivated and these areas are used for growing trees, bushes and grasses of economic value. So such waste lands are the main source of products and services obtained through fuel wood, timber and fodder etc.

Karmann and Larbach (1995) studied the livelihood of majority of rural households in Africa that are in fact on the natural vegetation and woodlands as a source of agriculture land, firewood, charcoal and NTFPs such as wild fruits and vegetables, fiber and medicines. About 150 local trees and shrubs were recorded during the survey of the rural communities in Africa for utilization of categories like timber and non-timber including carpentry, firewood and charcoal.

Miller (1995) said that one third Himalayan land is covered by rangelands over three-fourths of the Tibetan plateau. A large livestock population and possibly 10 million livestock dependent people use the grazing lands of the region. Most of the Asian's major rivers originate in these rangelands. Pastoralists are found throughout the Himalayas and on the Tibetan plateau with major occupation. Primary land use in higher elevation areas i.e. (> 3000m) grazing for livestock. Covering about 2.5 million square kilometers, that plateau is one of the major rangeland ecosystems of the world. Rangeland is covering 70 percent of the total land area of the plateau. That plateau is a pastoral region and is really a valuable place for wildlife pastoralism in the Himalayas and on the Tibetan plateau having its own beauty differentiated from the classic examples of nomadic pastoralism found in various regions of world such as Africa (Ekvall 1968). Trans-Himalayan trade presents an essential element in the economy of the many pastoralists found in the area of northern Nepal. The rangelands of the Tibetan plateau have many important species of medicinal plants and wildlife also.

Tarawali (1995) in his study showed that the grass, fodder and forage are very necessary for the survival of live stock. Some people of the local communities can not afford the expense of their live stock so they are highly depended upon natural

vegetation. The people of the communities who are lives in forests, have large number of animals because of the availability of fodder and forage free of cost. So, natural vegetation is very important for those people who have domestic animals.

UNDP (1998) in its report narrated that:

> "*Biodiversity resources play a critical role in the region's overall economic development and in the survival and well-being of its people. Thousands of species of plants and animals supported the development of early societies and provided the basis for hunting and gathering, agriculture, animal husbandry, forestry and industry. Development of the mountain economy in the region will depend on the sustainable use of biological resources, including maintenance of diversity in mountain agriculture crops, improved management of pastures, rangelands for livestock and multiple-use management of forest resources with an emphasis on non-timber forest products (NTFPs), medicinal plants, fruits, bamboo and rattan and bee keeping. These are accessible means of increasing food production and generating income for mountain communities in the Himalayas*".

Athar (1999) described that the fuel wood from forest is a major source of energy to heat and survive through the severe cold season and to cook while the alternatives of fuel wood are not cheaply available to the people. The village institutions have started to compact tree plantations on lands coming under new irrigation ways, which might be another source of fuel and timber wood in future.

Dam (1999) said that, Chagna (*Bromelia Hieronyni*) is a plant traditionally used for the food and fiber. The local community of Wichi (Argentina) is a basically hunting gathering society. Majority of Wichi families earn their livelihood from the sales of crafts that they produce. Crafts are made from chaco hardwood, some are made by using the local plant Chagna. Women are to travel in the forest for harvesting that plant. The Chagna, as most other natural resources such a fresh water fish, animal and forest fruit is a resource that is freely accessed by the local community of Witchi. In the middle of nineteenth century Witchi lived as a hunter gathered and fisher men but they changed

their way of earning and approached the natural vegetation. During the rainy season they move in to the forest and during the dry season they fish on the rivers. So, the natural flora has deep economic colour in their lives.

Al-Sadhan (1999) conducted a study on the "Miswak, A cultural and Scientific Heritage". His finding showed that natural vegetation is very important for all human beings and the people of the local communities use natural vegetation for different purposes. People of the local communities use Miswak (Chewing stick) which is beneficial and they got Miswak from the natural resources. He also concluded that Miswak keep the human teeth very strong. Miswak also saved the human from different teeth diseases. It is scientifically proved that Miswak is vegetation which is used as blood gum and finding also support the natural vegetation because it plays an important role in human beings life.

Jabeen (1999) described that the Pakistan has a 5000 year of civilization. It is the tenth most populous country of the world with 0.67 percent of the world land and having 0.2 percent of the world people. Forests and other natural resources are the gene pool of the biological heritage. Ayubia National Park is one of the three national parks of NWFP (Ahson 1997). Natural vegetation of this park is providing a large benefit to the local people. Free grazing is a common feature of the area. Some people also use trees for the forage of their livestock. Medicinal herbs are used for the veterinary diseases. Local community also utilizes a large quantity of fuel wood from its surrounded forests.

Shinwari and Khan (1999) focused their study on Margalla hills National Park Islamabad. They described the dependence of local inhabitants on plants for different socio-economic requirements such as food, shelter, fodder, health care and other cultural

purposes. They also enlisted different medicinal herbs used by the local inhabitants. The study explains the importance of natural vegetation in different requirements of local community.

Loreau (2000) in his scientific investigation conducted on the "Respective roles of recent hedges and forest patch remnants in the maintenance ground beetle diversity in an agricultural landscape", discerned the climate of the world is widely changed because of the diversity of the forest. Industries effect badly to the world temperature and the entire environment. So, in this situation the natural vegetation is most important for the human beings. His findings show that the local communities highly depend on the natural vegetation for the hedges. People of traditional societies which are located in the surrounding of the forestry areas, use a large number of hedges.

Shinwari *et al.* (2002) mentioned that most of the Pakistani population depends upon plant resources for fuel wood. The chief threat to the trees and shrubs is the fuel shortage in the mountains. About 70 percent of the population of Pakistan depends on wood for fuel and timber. Fuel wood is almost the only energy source used by the tribal people in Pakistan for cooking their meals at home. Fuel wood consumption of Pakistan is more than 565 million cubic meters and is constantly increasing. Preliminary investigation of the study showed that more than 80 percent of the households all over the tribal areas use wood as fuel, 10 percent use animal dung for domestic cooking, 4 percent use kerosene oil and less than 4 percent use electricity. These people have no alternative energy except cutting plants for cooking their meals (Shinwari *et al.*, 1996).

Shinwari *et al.* (2002) again highlighted that 10 percent of Pakistani flora is used as medicines. More than 300 medicinal plants are available in the market. The 10 leading

Dawakhanas of Pakistan annually consume more than 0.64 million kg of 200 medicinal plants while 95 species in Pakistan are found to be consumed amount to 4.52 million kg. These medicinal plants are collected from the wild. The local collectors are unaware of the exact procedure of collecting medicinal plants and they do not even know the costs of these plants from their center of origin to the national and international markets.

The price of the crude drug increases more than 100 percent when it reaches to the market.

IUCN (2003) remarked that

> "*Many local rural communities including, in particular but not exclusively, tribal or indigenous peoples, have an integral and intimate link with the natural resources and ecosystems surrounding them. Their knowledge base, cultural traditions and practices relating to biological and other natural resources remain a critical component in the conservation of biodiversity. Specifically, in the case of protected areas (PAs), their potential role is essential, and is increasingly being fulfilled in many countries. The term "conservation" is used here to mean protection, regeneration, rehabilitation, restoration and sound management of ecosystems, including species protection, sustainable use of natural resources, and other management options*".

IUCN (2003) indicated in its report that the Northern Areas mountain environment provides a wide range of biological and natural resources for the socio-economic benefits to local communities. It includes land for cultivation, water for drinking and irrigation, rangelands for livestock and forest for fuel wood timber and medicinal plants. These benefits are not only a part of natural environment but also provide a diverse variety of essential ecosystem services including pollination of food crops, watershed protection, the maintenance of hydrological regimes and the maintenance of soil fertility. These are the major factors of the social, economic and environmental dimensions. The Northern Areas natural forests fall under two broad legal

divisions, protected forests and state-owned forests. Private forests are owned by the local communities under the terms of Gilgit Private Forests Regulation of 1970. The approximate area of private forests is 217,088 ha. They are owned by the tribal communities of Chitral, Darel and Tangir but managed buy the Northern Areas Forest Department which is responsible for the marketing of timber.

Sikorski (2003) conducted research entitled "Country park timber vegetation in agricultural landscape at background forest areas." The area of study was Masuria district. The findings of this study showed that people get timber from the natural vegetation to fulfill their needs. People also get timber from the forestry areas to earn income.

Khan (2004) studied that,

> "*There is a direct interaction between human and plant population through its culture. Each human with plants, developed attitudes, believes and learn the use of plants, while human behavior has a direct impact on the plant communities with which they interact. The plants themselves also impose limitations on human*".

Klotz et al. (2004) presents a study on "The flora of German cities is naturally species rich". The results of this study clearly showed that not only naturalized alien plant species but also native plant species contributed to higher plant species richness in urban areas. Thus, the high species richness of cities was not only due to cultivated or introduced alien plants, as suggested by several authors (e.g. Bartlett et al., 1999; Kent et al., 1999; McKinney, 2002.They also conclude that to maintain species diversity, it is vital to increase conservation activities in human-dominated ecosystems, particularly those in and around cities (cf. Balm ford et al., 2001;Rosenzweig, 2003; but see Dobson

et al., 2001) and that a full understanding of the importance of urban biodiversity be incorporated into urban development and planning (Niemel, 1999).

Ali and Banjimansen (2004) discussed that during the past century the "Theory of Himalayan Environmental Degradation" has dominated mainstream views concerning natural resource management in the Himalayan region. The main tenet of this theory is; increased human population has resulted in increased demands for natural resources, leading to severe resource depletion, especially deforestation. In this article, local data was used on fuel wood consumption and timber extraction from Basho Valley in northern Pakistan to investigate whether such general perceptions regarding forest depletion can be supported by an empirical case study. The results of this study indicate that local fuel wood collection is not the main cause of deforestation. Instead, the estimated deforestation of about 30% during the last 3 decades is primarily due to commercial harvesting and mismanagement by the government. A large amount of dead fallen wood and green trees was sold by the government or was taken out by a "timber mafia" that emerged during the main period of commercial harvesting in the 1970s and 80s. Thus, it is commercial and illegal harvesting that has left the forest in such a depleted state that it can no longer withstand the pressure from local use.

Steimann (2004) also found out that to assess the role of forest resources in rural livelihood strategies a study was conducted in the North-West Frontier Province of Pakistan. The assumption has been made that forests are a very important resource for the livelihoods of the rural people, an important part of income of local households was gathered through forest-related activities. Three villages Kanshian, Gali Bordal and Chamttar were selected for study purpose. It was shown that almost all households in the

selected villages are using fuel wood for cooking purpose. In the mountain areas alternative energy source are scare. Hardly one-fifth of all households have alternative source of fuel cooking their meals. Khattak (1995) calculated an average per head consumption of fuel wood 1.5 m^3 per annum for the hilly areas of NWFP. For an average household size of 8.5 people in selected area the fuel wood consumption would be about 12.75 m^3. Fuel wood collection is time consuming and is the primary occupation for men and women during winter season. Some parts of study area buy fuel wood from market for about 70 Rs. per 50 kg. Almost 30 percent of all the households obtain fuel wood from neighbors. Timber is also widely used as a construction material all over the Pakistan. Totally wooden houses are rare even in mountain areas. NTFPs such as herbs and mushrooms are collected by one-fifth of the households in major part of study area. The amount of time spent by the local community on forest-related activities can also be used as an indicator for the importance of natural vegetation. It was examined that 17 percent of all adult respondents at least once a week went to collect fuel wood. Women spent their time more than men on fuel wood collection. Total 9 households of the study area are at least partly dependent on the forest-related incomes by selling fuel wood or timber. In the past, forest department often hired local people for jobs in the local forests of the area. But after 1992, when a nation-wide ban of timber harvesting was imposed the job opportunities in forest department had declined close to zero.

Adesina (2005) describes that throughout the history, man has used the natural resources for livelihood support. Indeed all human civilizations derive their basic requirements and sometimes also their credibility from the ability to use the natural resources to the advantage of their societies in one way or the other. Natural resources are endowments of a society which can be exploited to improve rural wealth in terms of

creating socio-economic opportunities. These resources include vegetation cover, water and, soil. In a rural setting, natural vegetation plays a major source of services and economic benefits that in turn contribute significantly to the overall well-being of local communities.

Shinwari and Begum (2005) in their report found out that the total area in Pakistan covered by natural vegetation is 4.8%. Natural vegetations contribute directly to 80% of livelihood of people living in extreme poverty. That study was held to find out the importance of non-timber products in NWFP. It was concluded that 17 species of mushrooms were used by the local communities. 34% of the local people of study area were dependent on NTFPs for income of their household. Honey, morels, wild fruits and nuts and spices are major food product provided by natural vegetation. Silk cocoons, lac, ivory skin, eggs, different animals and birds as animal products are provided by the natural vegetation. Bhabar grass, resin and vegetable tanning are industrial NTFPs. Oils, soap-nuts, walnut bark, gums, chewing sticks, Mazri leaves, ornamental flowers and sea buckthorn are miscellaneous non-timber forest products generated by natural vegetation.

Elujoba and deleye (2005) conducted a study in Africa on "Traditional medicine development for medical and dental primary health". Their findings showed that different traditional communities use different medicinal plants for medicines. The people of the local communities used medicinal plants for human diseases and some for livestock. Some people of traditional communities in Africa made medicines of medicinal plants and earn income from selling these medicines. Natural vegetation is very beneficial for the traditional communities of the Africa in socio-economic aspect because the people of surrounding communities of forestry areas get vegetation from forest and used them for

different purposes.

Thuan (2005) explains the relationship between poverty and livelihoods and rural forest-dependent people has been highlighted by many scientists throughout the world. Timber products gained from natural vegetation are diverse and trees are one of the important income source for many households in different communities. However, commercial scale timber harvesting is seen also beneficial for local communities. Supply of raw material for paper production could be seen as good method for poverty reduction. According to Nuyen Singh Cuc (2003) Non-timber Forest Products (NTFPs) collection is an additional source of income derived from forests. It provides 13.7% of the income from forestry activities of households in rural communities of many areas. In regions of more natural vegetation and in the areas where many ethnic minorities are living, the percentage of forestry income derived from NTFPs is higher. But in comparison of NTFPs income to the total income of household, income from NTFPs alone is very low.

Basanta Kumar Shrestha presented a study in 2006 on the "Nutrient contents of feeds and fodder in Nepal." He conducted his research in Nepal. His findings showed that natural flora is widely used in the traditional communities of Nepal and they got benefits from the vegetation. The people of local communities used vegetation especially grasses as a fodder and forage for their animals. The people of those communities have animals and earn income from their animals. The forestry areas are much beneficial for them due to over grassing. His findings also showed that the forestry areas are decreasing due to lack of care and due to cutting large number of trees daily.

Zafar and Akbar (2007) analyzed that the sources of energy for domestic fuel in Bunji have fuel wood from agro forestry, natural forest, LPG cylinders and kerosene oil.

According to the survey, wood from social-forestry is the main source of domestic fuel with an annual consumption of 5115.76 kg per household. This contribution is 98.01 percent of the total domestic fuel wood consumption. One of the interesting factors that are found during the survey was that nobody of the local community in Bunji purchases fuel wood from outside the valley. Except the non-local government servants, armed forces and other non-local employees all the local population is self sufficient in fuel wood owing to the large-scale agro-forestry. Other sources of energy as gas and kerosene oil have least contribution in domestic fuel consumption with 1.98 and 0.01 percent respectively. Detail has been given in the table number 8. The data shows that the local communities are not extracting wood from natural forest for domestic fuel purposes. This indicates no pressure on natural forest.

> *Anon (1998) provided literacy rate of District Chakwal as, "of the total educated persons 18.6 percent were below primary, 35.2 percent had passed primary, and 23.2 percent middle, 16.3 percent matriculation 4.1 percent intermediate, 1.7 percent Graduates, 0.5 percent postgraduates and 0.3 percent were with diploma/certificate holders. Regarding sex differential, males were more educated and had higher education than females. In urban areas of the district there were around 3.6 thousand graduates while in rural areas 6 to 7 thousand found with graduate degree."*

Asad et al. (2011) discussed the value of medicinal plants of Pakistan and there utility for snake bite. They elaborate scientifically un-investigated/ ignored medicinal plants of Pakistan showing chemical constituents of natural origin with possible mechanisms showing anti-venom activity. This review enlists 35 plants with their families, distribution in Pakistan, parts used traditionally for snake bite treatment and various active principles present in them. Compositae is the most excessive family, with 3 species, followed by Amaranthaceae, Apocynaceae, Asclepiadaceae, Caesalpinaceae, Labiatae, Pinaceae, Polygonaceae and Verbinaceae having 2 species of

medicinal plants. While, one plant species belongs to each, Aizoaceae, Araceae, Boraginaceae, Chenopodiaceae, Cucurbitaceae, Euphorbiaceae, Flacourtiaceae, Gentianaceae, Malvaceae, Menispermaceae, Mimosaceae, Oxalidaceae, Papilionaceae, Plantaginaceae, Salvadoraceae and Solanaceae. As an antidote to snake poisoning, the traditional use of leaves (35%) is higher than roots (25%), whole plant (21%), flower (7%), wood (5%), fruit (5%) and milky juice (2%). Among life forms of plants, herbs (55%) are more excessively used as snake bite remedy than shrubs (31%) and trees (14%). This article may help the researchers to bring novelty in the field of natural products for the treatment of snake bite. However, chemical and pharmacological studies are necessary to confirm the anti-venom claims about these medicinal plants of Pakistan.

Wysocki conducted research on "Country Park Timber Vegetation in Agricultural and Landscape of Background forest Areas" in west Masuria District. The finding of the study showed that the nature park and forest areas are covered by the bushes and non timber trees. So the need is to grow forest and natural park which may use in timber and give benefit to the local communities and also country as a whole. These natural plants of bushes are important for the fodder and forage of animal. So there is a need to cultivate the timber and fuel wood trees.

CHAPTER THREE

MATERIALS AND METHODS

This chapter explains the entire methodology which has been adopted during this research. Different sections of this chapter will explain the following important points related to study: research area profile, sample size and technique, data collection technique, analysis, statistical technique, variables of research and operational definition. This chapter will cover a brief explanation of each of the method and technique applied during research.

3.1 STUDY AREA PROFILE

The relationship of man and environment goes back in the history. In recent era such links are further strengthening due to modern technology and advancement of knowledge. Realizing the importance of natural vegetation and the extent of their values for the society, the government of Pakistan has declared 23 sites as National Parks in different parts of the country. Current study was conducted in Margalla hills which fall in the vicinity of Federal area and Khyber Pukhtoon Khawa (KPK) province of Pakistan, where three districts Islamabad, Haripur and Abbottabad joint in a beautiful locality of hills. Margalla hills are also the part of Margalla Hills National Park. Margalla Hills National Park is comprised of Margalla hills, Rawal lake and Shakar Parian. The said park was established in 1980 under Islamabad Wildlife Ordinance 1979. It is spread over an area of 17,386 hector. The park was notified in 1980 and is divided into three units; Margalla hills (12,605 hector), Rawal Lake (1,902 hector) and Garden Avenue (1,376 hector). The park is situated at 73°7'3.32"E, 33°41'59.61"N and 73°1'34.07"E, 33°45'2.87''N, respectively. The park provides diverse mix of ecological, cultural and

recreational benefits not only for the inhabitants of these villages but also for the surrounding of Islamabad, Haripur and Abbottabad districts. The topography of the national park is rugged and its elevation ranges between 450 m to 1600 m. Climate of the area is distinguished as semi-arid, with mild summer and winter. The national park has two types of forests; subtropical dry deciduous forest and subtropical Chir-pine forest. Northern area of the park is mostly concentrated by the subtropical Chir-pine forests. The flora includes; 101 families, 548 genera, and 608 species. This depicts a good variety of flora being harbored by the park. Few common tree species of the park include; *Acacia catechu, Acacia nilotica, Bauhinia variegata, Pinus roxburghii and, Olea ferruginia* etc. (Anon 1980).

The Wildlife Ordinance 1979 prohibits the capturing, killing, and trapping of wild animals. Natural vegetation of area is also protected under the law although local communities are allowed to meet their daily requirements under certain limitations. Local culture is very near to the usual indigenous culture of hilly areas. The protection of natural resources of local area under the umbrella of national park is obvious protection of traditional culture of Margalla hills. Margalla hills include historical and archaeological sites within.

3.2 SAMPLE SIZE AND TECHNIQUE

Table 3.1 Distribution of respondent regarding their districts

Name of Districts	Frequency	Percentage
Islamabad	152	42.9
Haripur	185	52.3
Abbottabad	17	4.8
Total	354	100

Margalla hills consist of three districts; Islamabad, Haripur and Abbottabad. However, major portion of the Margalla hills is occupied by Haripur and Islamabad districts while there are only two villages of Abbottabad district that are located at higher altitude. Although there are many villages in the Margalla hills, but only those were selected for study which falls within the hilly tract right inside the forested area. The major reason for this approach was to collect data from those communities who heavily depend on the natural vegetation.

Table 3.2 Distribution of sample by name of villages, union councils and districts

Village	Union Council	District	No. H.H	No. Voters	Frequency of Respondents	Percentage
i. Gokina khurd	Shah ALLAH Ditta	Islamabad	337	438	63	17.80
ii. Gokina kalan	Shah ALLAH Ditta	Islamabad	367	577	69	19.50
iii. Naryas	Bara Kahoo	Islamabad	20	57	5	1.4
iv. Sandhoori	Shah ALLAH Ditta	Islamabad	11	27	5	1.40
v. Malwari	Muslim Abad	Haripur	50	177	10	2.80
vi. Kotla	Muslim Abad	Haripur	554	2400	104	29.40
vii. Kanthla	Khan Pur	Haripur	235	375	44	12.40
viii. Sahbara	KhanPpur	Haripur	197	316	37	10.50
ix. Pandal	Bar Kot	Abbottabad	43	94	8	2.30
x. Phareela	BarKkot	Abbottabad	47	107	9	2.50
10 villages	4Uunion Councils	3 districts	1861	4568	354	100

At first stage of sampling, villages were selected (randomly) from two districts, Islamabad and Haripur. At the second stage of sampling, proportionate random samples of 354 respondents were adopted using simple random sample technique with the help of voting list. There are a total of 20 villages inside Margalla hills; 9 villages belonged to each of Islamabad and Haripur districts while remaining two villages were the part of Abbottabad. For the current study, 10 villages were selected out of a total of 20 (50% of the entire population), using simple random sampling (SRS); Four villages each from Islamabad and Haripur districts and two from Abbottabad. Since a small area of the district Abbottabad falls within Margalla Hills (only two villages), therefore both the villages were selected for this study. Tables 4.2, depicts the distribution pattern of households in the selected villages in their respective Districts and the union councils respectively.

Two villages from Islamabad district (Gokina Khurd and Gokina Kalan) and two from Haripur district (Kotla and Kanthla) were most populated among all the villages included in this study. Total 19% of the households were sampled for this study. However, the smallest amongst all the villages were Sandoori (11 households) and Naryas (20 households), both from Islamabad district, therefore, five households from each of these two villages were sampled for this study keeping in view their smaller sizes. Data on various variables were collected from all the selected villages.

3.3 DATA COLLECTION TECHNIQUE

A structured interview schedule was constructed for data collection purpose. Researcher collected data with the help of research team, who were learned sociologist. Members of the team were given extensive training on data collection and about the objectives of the research. Household head was preferred for data collection. Only male

respondents were questioned because most of the economic outdoor activities are performed by the males.

3.4 DATA ANALYSIS

SPSS was used for data analysis purpose. Simple percentage method and advance statistical technique such as Chi-Square and Gamma are used to test the significant association of the variables.

3.5 STATISTICAL TECHNIQUES

Following statistical techniques were used for the analysis of primary data.

3.5.1 SIMPLE PERCENTAGE METHOD

To describe the basic characteristics of households and to explain the existence of natural vegetation in socio-economic activities, respondent's percentages were calculated by using following formula:

$$P = f/N \times 100$$

Where

P = Percentage

f = Frequency

N = Total number of respondents

3.5.1.1 MEAN

Frequency distribution of univariate was explained in the form of percentage and some of them are supported by their Mean, Median and Standard Deviation. Percentage was calculated with the help of following formula:

$$X = (\sum fx)/(\sum f)$$

Where:

X is sample Mean

f is corresponding frequency

x is number of observations.

3.5.1.2 MEDIAN

Chaudhry & Kamal, (2001) define Median as the value which divided the order data into equal parts, one part comprising the observation greater than the value and other smaller. Median is calculated with the help of following formula

Median=l+h/f(n/2-C)

Where:

l is the lower boundary of the Median group

h is difference between group

f is frequency of Median group

n is total frequency

C is cumulative frequency

3.5.1.3 CHI-SQUARE TEST

Chi square was used to find out the relationship between dependent and independent variables; chi-square test is equally important and applicable for the quantitative and qualitatitive data and can be calculated with the help of formula given below.

$x^2=\sum ((o-e))/e$

Where

O is observed values

E is expected values

The chi square test was tested on .001 and .05 of level of significance.

3.5.1.4 GAMMA

Gamma is frequently used test statistic for finding out the association between independent and dependent variables. Gamma is commonly used for the ordinal nature of data. Gamma has been used in the study in a bivariate analysis tables. Leother & Mcdonald, (1980) define Gamma as:

"Gamma is a symmetric measured of association so that the value calculated remains the same regardless of which of variables is specified as independent and which is specified as dependent."

3.6 VARIABLES OF RESEARCH

3.6.1 DEPENDENT VARIABLES

Three variables fall in the list of dependent variables.

3.6.1.1 SUSTENANCE

Sustenance means to find out the role of natural flora in the domestic, daily and personal use of respondents and their households.

3.6.1.2 SERVICES

Services includes the public and private sector jobs and self-services provided by villagers in context of natural vegetation, like jobs in forest department, wildlife department, environmental NGOs (IUCN and WWF-P) and self-services (tourist guide, porter etc.).

3.6.1.3 BUSINESS

Business includes the sale of those products which directly or indirectly made up of natural vegetation like dairy products, buckeyes, livestock, domestic products, fuel wood, timber, and Miswak and farm implements made of natural vegetation.

3.6.2 INDEPENDENT VARIABLES

3.6.2.1 LAND

Land is always a valuable asset for villagers. They make houses, animal corals, and vegetable and grain fields. This study has considered land as one of the determinate of variables under discussion. For convenience land has been divided in cultivated, barren and total land categories.

3.6.2.2 LIVESTOCK

Livestock are domesticated animals owned by villegers. Local people which have agriculture as major profession usually rear livestock in arid zones. Mostly people have buffalos, cows, goats, sheep and dinkies in their homes.

3.6.2.3 FODDER AND FORAGE

Fodder is cultivated food for domestic animals and forage is obtained from natural vegetation like grasses, bushes or trees.

3.6.2.4 FUEL WOOD

The wood which is used for domestic energy for cooking and heating. Most of the rural communities in world depend upon fire wood for their domestic energy needs.

3.6.2.5 TIMBER

It is excellent wood obtained from trees and used in construction like door, pillars, windows and roofing.

3.6.2.6 HEDGES

These are the fences often obtained from thorny bushes and used for the protection of household, livestock, crops and for boundary demarcation also.

3.6.2.7 HONEY

Here honey is considered which is obtained from natural flora and after simple process it is used in best nutritional and medication purposes.

3.6.2.8 MISWAK

It is new grown branch of tree or bush used in the form of chewing stick for cleaning teeth. It has also medicinal benefits.

3.6.2.9 MEDICINAL PLANTS

These are natural vegetation (mostly herbs) used indigenously for the treatment of different diseases both for human and livestock.

3.6.2.10 WILD FRUITS AND VEGETABLES

As shown from name these are different fruits and vegetables grow in wild plants after simple purification and they help the villagers in their nutritional requirements.

3.6.2.11 DAIRY PRODUCTS

Those products which are obtained from domestic animal (milk and butter etc) and compensate the villagers in the form of alternative income.

3.6.2.12 DOMESTIC AND AGRICULTURE PRODUCTS

Those products are made by natural flora and help local villagers in their domestic and cultivation use.

Table 3.3 Presentation of variables in tabulation form

DEPENDENT VARIABLES	INDEPENDENT VARIABLES
Land	Sustenance
Livestock	Service
Fodder & forage	Business
Fuel wood	---
Timber	---
Hedges	---
Medicinal plants	---
Wild fruits and vegetables	---
Honey	---
Miswak	---
Dairy products	---
Domestic and agriculture product	---

3.7 OPERATIONAL DEFINITIONS

3.7.1 NATURAL FLORA

Natural vegetation or flora is divided in four major groups trees, herbs, shrubs and grasses. Trees are utilized for fuel, timber and different products made by wood. The major application of herbs is as medicinal plants. Shrubs also have multipurpose like fences, fodder, fuel and source of non timber forest products (NTFP) like wild fruit and vegetables and honey. Grasses are the basis of grazing for livestock.

In current study following products depend on natural flora directly or indirectly, were considered.

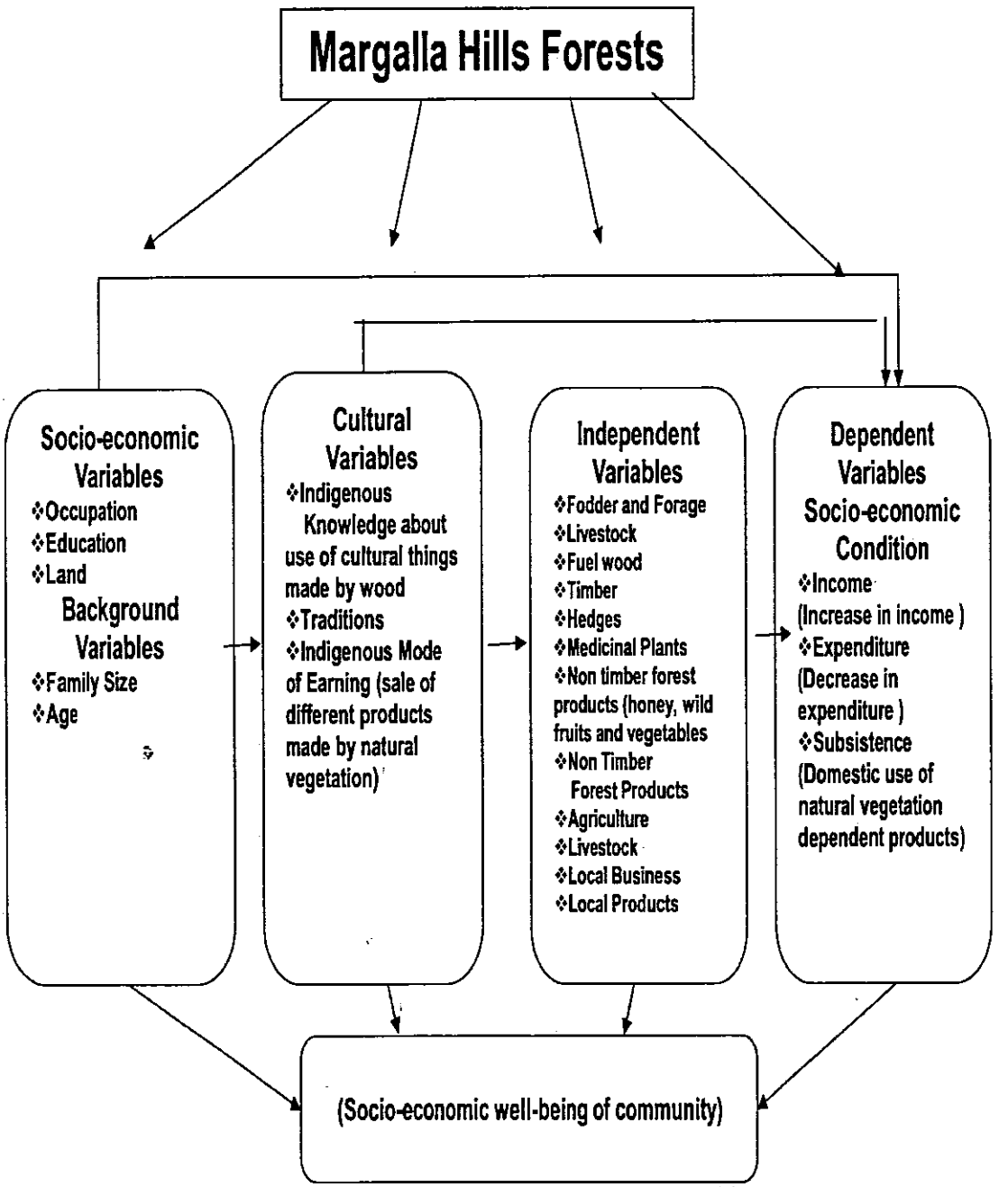
a. Livestock
b. Fodder & forage
c. Fuel wood
d. Timber
e. Hedges
f. Medicinal plants
g. Wild fruits and vegetables
h. Honey
i. Miswak
j. Dairy products
k . Domestic and agriculture product

3.7.2 LIVELIHOOD STRATEGIES

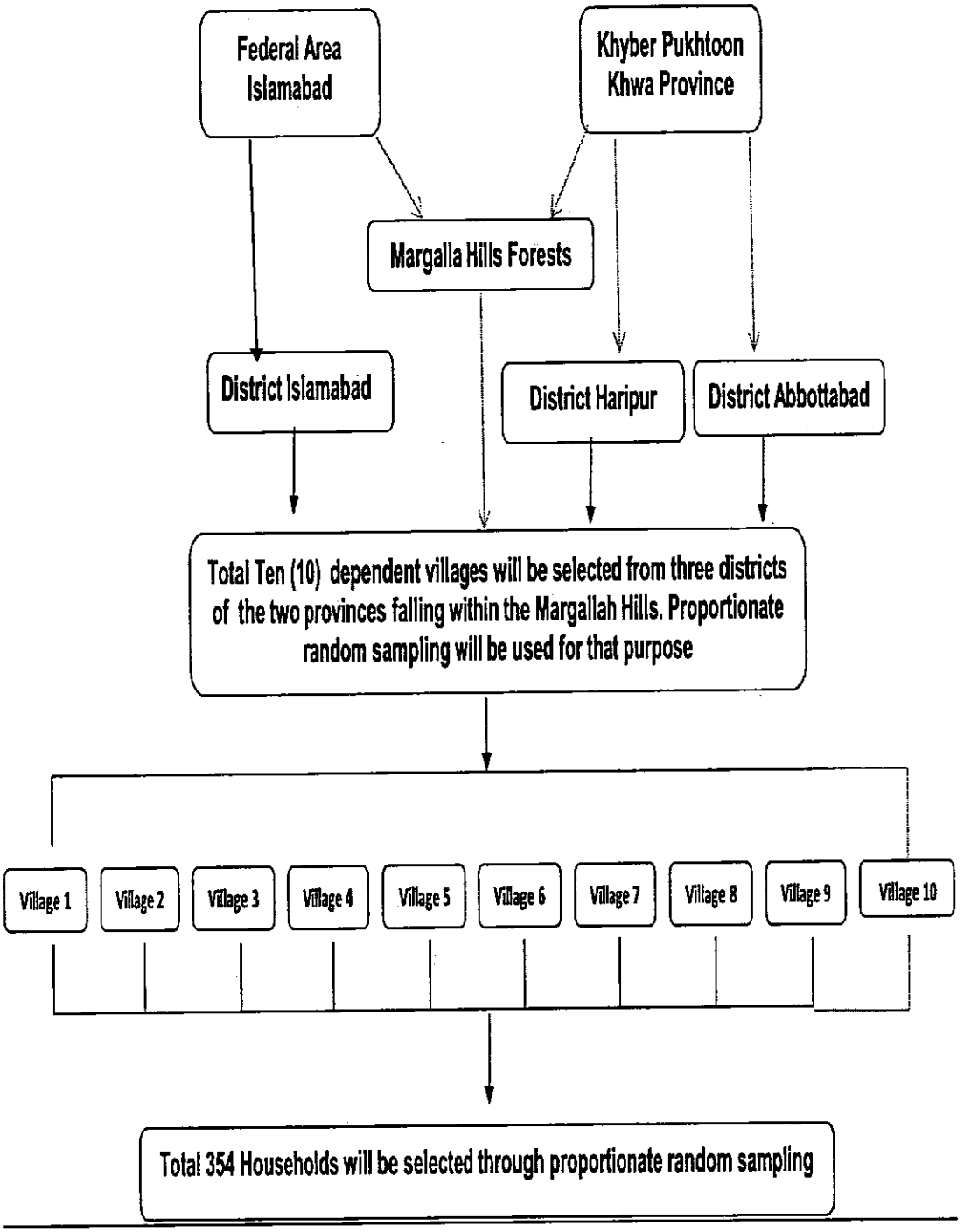
In current research livelihood strategies are those efforts which were performed by local people to full fill their economic needs. These are the strategies which directly or indirectly depend upon natural vegetation. Researcher finds out the influence of natural flora on their economic efforts to estimate the impact of natural forests as financial welfare of local communities. Following enlisted economic activities were investigated to find out the influence of natural flora in the socio-economic well-being of rural communities.

a. Sustenance
b. Service
c. Business

Conceptual Framework of the Study



DIAGRAMATIC REPRESENTATIOM OF SELECTION OF SAMPLE



CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter is comprised of discussion on two type of analysis of data. Firstly, it concentrates on univariate analysis wherein only single variable is focus of discuss. Secondly, the discussion is on bivariate analysis which comprised analysis of two variables exploring the relationship between variables.

4.1 UNIVARIATE ANALYSIS

Univariate analysis deals with the results and their statistical description of single variable. The data in this type of analysis is given in different forms such as table, chart or geographical representation. It involves to work out frequency distribution along with percentages of each variable. In addition measures of central tendency such as Mean, Median and Mode are also used to find out the trends in data. Furthermore another set of measures are used in univariate analysis which is statistical dispersion. Range, Standard Deviation and Variance are the examples of statistical dispersion.

4.1.1 SOCIO-ECONOMIC VARIABLES

Socio-economic variables are very important and helpful in understanding pattern of socio-economic change in any society. Socio-economic variables depicts economic background picture of respondents and study area. Age, education, occupation, income, and expenditure are the major variables which come under the socio-economic profile. Tables 4.1.1, 4.1.2 and 4.1.3 explain the socio-economic conditions of villagers in detail.

Table 4.1.1 Distribution of respondents by their age, education and highest education in household

Age of the respondents (Number of Years)				
Categories	**Frequency**	**Percentage**	**Group Mean**	**Group Standard Deviation**
i. Up to 25	74	20.9	21.54	2.665
ii. 26 – 35	92	25.9	31.11	2.641
iii. 36 – 45	72	20.3	40.89	3.151
iv. 46 – 55	51	14.4	50.55	2.595
v. Above 55	65	18.3	65.97	8.223
Total	354	100	40.30	15.838
Education of the respondents				
i. Illiterate	91	25.7	0.00	0.000
ii. Primary	90	25.4	4.39	0.991
iii. Middle	71	20.0	7.44	0.806
iv. Matriculation	65	18.3	9.94	0.242
v. Above Matriculation	37	10.4	13.03	1.462
Total	354	100	5.79	4.353
Highest level of Education in household other than Respondents				
i. Illiterate	53	14.9	0.00	0.000
ii. Primary	31	8.7	4.45	0.888
iii. Middle	57	16.1	7.49	0.759
iv. Matriculation	135	38.1	9.95	0.223
v. Above Matriculation	78	22.0	13.19	1.451
Total	354	100	8.30	4.326

4.1.1.1 AGE (At the Time of Interview)

Table 4.1.1 shows that 47% of the respondents were up to 35 years old whereas 35% were in 36-55 years of age. There were still 18.3% of the respondents who are above 55 years old. The closer look at data shows that 26% of the respondents were 26-35 years old which is an active age category as compared to other age groups. This active age

category usually intensively involve in domestic as well as livelihood earnings in rural areas. The mean age of the respondents is 40.3 years whereas standard deviation is 15.8. The mean and standard deviation for individual age category were also calculated and shown in table under discussion.

4.1.1.2 EDUCATION OF RESPONDENTS

Education is very important for individuals as well as society. Education enhances the physical, mental, social and economic skills of a society. No society can develop without promoting system of education for its inhabitants. Education tells men how to think, how to work properly and how to make right decision at right time.

The table under discussion shows the level of education of the respondents. It indicates that 26% were illiterate whereas remaining 74% were literate. Among the literate, 45% of the respondents were under matric, 8.3% matriculate and remaining 10.4% were at a higher level than matric. It expressed that only few of the respondents were highly qualified.

4.1.1.3 THE LEVEL OF EDUCATION IN HOUSEHOLDS EXCLUDING RESPONDENTS

During research, data was also collected on the level of education of household other than respondents. On average 15% of the members of a household were found illiterate, whereas 8.7, 16.1, 2, 8.1 and 22 percent of the members of households were at primary, middle, matric and above matric, respectively. Mean highest level of education was 8.3 years of schooling whereas standard deviation was 4.33.

The low level of education is because of poor educational facilities, low level of income and backwardness. Because of low literacy rate one can see a lot of social, political and economic problems faced by the residents of targeted area.

Table 4.1.2 Distribution of respondents by occupation of respondents and major occupation of household

Respondents' Occupation	Frequency	Percent
i. Agriculture	128	36.2
ii. Government Job	85	24.0
iii. Private Job	60	16.9
iv. Business	18	05.1
v. Self Employment	13	03.7
vi. Skilled Labor	27	07.6
vii. Unskilled Labor	17	04.8
viii. Overseas	6	01.7
Total	354	100
Major Household Occupation (Excluding Respondents)		
i. Agriculture	163	46.0
ii. Government Job	81	22.9
iii. Private Job	40	11.3
iv. Business	9	02.5
v. Self Employment	13	03.7
vi. Skilled Labor	28	07.9
vii. Unskilled Labor	12	03.4
viii. Overseas	8	02.3
Total	354	100

4.1.1.4 OCCUPATION

Same as the education and income, results of occupation were also recorded in two categories, occupation of respondents and others in the household. Respondents' occupation is a major source of earning for the household and remaining members are doing certain part-time businesses. Two major occupations were found among the rural communities namely agriculture and services (both public and private sectors).

Agriculture plays important role in the lives of rural masses (as 36% of respondents and 46% of household members has agriculture as occupation). But there is a difference when we talked about Hilly and Irrigated areas because of circumstances around. One can enjoy economies of scale for cultivation in irrigated areas due to easy availability of water, irrigation system and high-tech facilities. Pete Smith and Daniel in 2007 also emphasized that agriculture is the main source of subsistence in all rural communities. Employment in the public sector is the second highest source of livelihood because of the proximity of the villages to the capital city of Islamabad where 24% of respondents and 22% of the rest of population have government jobs.

Private sector engagements are third source of earnings for the villagers. As 16.9% of respondents and 11.3% of rest of population have private jobs as their occupation. Very few numbers of villagers were doing rest of the business activities. There were only 2.30% of the people who belonged to the category of "Overseas". It shows a least reliance of the people of sampled areas on the economies of abroad.

Table 4.1.3 Distribution of respondents / households by their incomes and expenditures

Income of Respondents (Rs)	Frequency	Percentage	Group Mean	Group Standard Deviation
i. Up to 10,000	182	51.4	7813.19	1962.562
ii. 10,001 – 15,000	89	25.1	13387.64	1478.545
iii. 15,001– 20,000	61	17.2	17770.49	1721.370
iv. Above 20,000	22	6.2	27704.55	4837.008
Total	354	100	12166.67	5919.112
Income of Household				
ii. Up to 10,000	96	27.1	7932.29	2152.868
iii. 10,001 – 15,000	83	23.4	13500.00	1526.194
iv. 15,001– 20,000	97	27.4	17773.20	1517.297
v. Above 20,000	78	22.0	29467.95	10193.371
Total	354	100	16679.38	9204.916
Expenditure of Households of Respondents				
i. Up to 10,000	136	38.4	8367.65	1945.779
ii. 10,001 – 15,000	102	28.8	13397.06	1522.664
iii. 15,001– 20,000	71	20.0	18063.38	1562.803
iv. Above 20,000	45	12.7	30144.44	9132.001
Total	354	100	14529.66	7847.509

4.1.1.5 INCOME

Results of the above table are very important for current study, because livelihood strategies of the local communities are to enhance their incomes and reduced expenditures through the proper use of natural vegetation in their lives.

People can save money by using natural vegetation for domestic fuel, medicine, timber, non-timber forest products (honey, Miswak, wild fruits and vegetables etc) and domestic and farm implements made by natural flora. Similarly there are a lot of

opportunities for earning extra money by promoting tourism, business and jobs related to Jungles.

As one of the objectives of this study is to examine the extent of socio-economic dependency of local communities on natural forests, so during the field survey data was also collected on respondent's personal income as well as income of the family per month. The table 4.1.3 indicates that majority (51.4%) of the respondents were in lower income group which was just up to 10,000 rupees per month. There were 25.1, 17.2 and 6.2 percent of the respondents who were earning Rs. 10,000-15000, 15,001-20,000 and above 20,000 per month respectively. The mean monthly income of the respondents was calculated as Rs. 12,167 and standard deviation as 5,919.11.

Regarding household income of the respondents, the data in the table (4.1.3) shows that 50.5% of the respondents had their monthly income up to 15,000 rupees which also includes 27% of the families whose monthly income was up to Rs. 10,000. There were 49.4% of the families whose income was more than 15,000 rupees per month which also includes 27.4% of the families with income 15,001-20,000 and 22% of the families with income above 20,000 Rupees per month. The mean family income of respondents was Rs. 16,679 and standard deviation as 9,205.

4.1.1.6 EXPENDITURE

Natural vegetation can play a vital role to overcome the increasing burden of expenditures. Different natural vegetations are used for certain household purposes which have some market value. For example fuel wood to replace LPG gas, timber to apply in construction and different domestic products, meditational herbs in several diseases.

Table 4.1.3 gives the detail of expenditures of local families. Results are arranged in ascending order regarding expenditure categories. The figures of the given table

collected during field survey on monthly expenditures shows that 30.4, 28.8, 20 and 12.7 percent of respondents' families were spending up to 10,000, 10,001-15,000, 15,001-20,000 and above 20,000 rupees respectively. The mean monthly expenditure was Rs. 14,530 and standard deviation as 7,848.

Table 4.1.4 Distribution of respondents by marital status, family type and household size

Marital Status of the Respondents	Frequency	Percentage
i. Married	296	83.6
ii. Unmarried	58	16.4
Total	354	100
Family type of the Respondents		
i. Nuclear	133	37.6
ii. Joint	213	60.2
iii. Extended	8	2.3
Total	354	100
Household size of the Respondents (Number of Persons)		
i. 1-5	116	32.8
ii. 6-10	169	47.7
iii. Above 10	69	19.5
Total	354	100

4.1.2 MARITAL STATUS

Table 4.1.4 shows that majority (83.6%) of the respondents were married whereas 16.4% of the respondents were unmarried. As all our respondents were also the heads of their houses, therefore in the data large numbers of respondents were married. The remaining numbers of respondents (16.4%) were single (for example elderly son of a widow).

4.1.3 FAMILY TYPE

In rural communities people generally prefer to live in joint family system to attain social and economic security. A socially well-connected lifestyle ensures the participation of every young family member as active labour force. Joint family type has key importance in agrarian societies. Agriculture need more man power in rural areas due to the low contribution of technology in their professional activities. This type of family system is also very popular in rural culture of Pakistan. This was mainly due to three major factors such as less land holdings, poverty and in-security which compelled them to live together. The main attribute of this family system is the distribution of everyday domestic activities which gives them liberty to handle their tasks more efficiently. Different family types existed in the subjected area. According to the results in table 4.1.4, joint family system was commonly practiced in the subject area. There were 60.2% of respondents who lived in joint family system. The second major category is this regard was nuclear family system with 37.6%. Only 2.3% were fall under the category of extended family system.

4.1.4 HOUSEHOLD SIZE

Household size is equally important along with family type. More number of family members is appreciated in agrarian society. Table 4.1.4 also discussed the household size of people of study area. According to the results, 47.7% of the respondents were residing as 6-10 members in a single household. This shows the ideal number for any single household in rural setting. As study focuses mostly on the outdoor socio-economic activities of the respondents, therefore this family size appropriately fulfills the requirements of a hard and struggled lifestyle. The second major category of

household size was 1-5 with 32.2% while only 19.5 families have more than 10 members. David H. Olson and Dean M. Gorall in 2003 concluded that family system and structures are complex models and thus vary according to different communities and norms.

Table 4.1.5 Distribution of respondents by status of barren and cultivated land

Land Ownership	Frequency	Percentage
i. Yes	282	79.7
ii. No	72	20.3
Total	354	100
Ownership of Cultivated and Barren Land (Kanals)		
Cultivated Land		
i. No cultivated Land	22	06.2
ii. No Land	72	20.3
iii. Less Than 8	153	43.2
iv. 9-16	53	15.0
v. 17-24	29	08.2
vi. 25-32	17	04.8
vii. 33-40	4	01.1
viii. 41-48	0	00.0
ix. 49-56	2	00.6
x. 56+	2	00.6
Total	354	100
Barren Land		
i. No Barren Land	139	39.3
ii. No Land	72	20.3
iii. Less Than 8	109	30.8
iv. 9-16	26	07.3
v. 17-24	1	00.3
vi. 25-32	2	00.6
vii. 33-40	0	0
viii. 41-48	2	00.6
ix. 49-56	1	00.3
x. 56+	2	00.6
Total	354	100

4.1.5 LAND OWNERSHIP

The land ownership is very important in improving the economies of the local communities because their major dependency is on agriculture, which has also been emphasized in table 4.1.2. Cultivated land is the source of grains, vegetables and fodder where as barren land is also the treasure of natural vegetation especially in hilly areas like universe of the research. Tables 4.1.5 give the details of cultivated and barren of local families. The findings show that more than 79.7 % of the total population has ownership of agriculture land and only 20.3% of the population is landless. Deng et. al. 2004 stressed that land play an important role in the economic development of any country.

4.1.5.1 CULTIVATED LAND

There are 43.2% people who owned less than one acre cultivable land. This is probably due to hilly landscape where leveled fields are hardly available. The other major category was 9-16 Kanals of land. In this category, the ownership belongs to 15% of respondents in term of cultivated land. There are only four families who own more than 49 Kanals of land. Another two categories are 17-24 and 25-32 Kanals with 8.2% and 4.8% respectively. As discussed earlier that in hilly terrain, one can rarely found plane areas.

4.1.5.2 BRRREN LAND

Those people who are deprived of cultivated land mainly rely on natural vegetation. The owners of uncultivated land also get valuables from their holdings in the form of fuel wood, timber and grazing grounds for their live stocks. Barnes (1995) also presents that areas of the natural vegetation are mostly barren or non-cultivated. Similarly, P. Buringh and R. Dudal in 1987 emphasize the importance of barren land in hilly areas. In case of Barren lands, 39.3% of respondents are categorized as "No Barren

Land". The second important category for the barren lands was recorded in less than 8 Kanals. The respondents for this category were recorded as 30.8%. Although, the area is a rain fed area, but suitable efforts should have been carried out to use it for cultivation. Better management practices for uncultivated lands can contribute for the conservation of natural forests.

Table 4.1.6 Distribution of respondents by cultivation and types of vegetables

Cultivation of Vegetables	Frequency	Percent
i. No Land	72	20.3
ii. Yes	78	22.0
iii. No	204	57.6
Total	354	100
Vegetables Types		
i. No Land	72	20.3
ii. Onion	30	08.5
iii. Potatoes	9	02.5
iv. Onion and Potatoes	20	05.6
v. Radish, carrot, turnip, cucumber	32	09.0
vi. No vegetables Cultivation	204	54.0
Total	354	100

4.1.6 CULTIVATION OF VEGETABLE

Table 4.1.6 explains that 22 % of families are growing vegetables to fulfill their domestic needs while 77.9% (20.3% have no land while 57.6% are not cultivating vegetables) of total population purchases their food items of daily requirement. The rest of the respondents have been found as growing vegetables. Onions and potatoes (16.6%) were found as main growing vegetables of the area while other vegetables mention in the mention in the table are either purchased or collected from wild or agricultural fields. The

second major category (Radish, carrot, turnip, cucumber) with 9% of respondents. The agriculture as shown in earlier table (4.1.2) has been recorded as the major subsistence for this area. Therefore, vegetable cultivation can also play a significant role in the economic well being of this area. The other major highlights were 54% of respondents replied with no vegetables cultivation. It shows the least interest of the respondents or the population of the sampled area towards not cultivating vegetables. Oladele (2011) concluded that fruits and vegetables are main source of income for local communities

Table 4.1.7 Distribution of respondents by cultivation, types and income related to crops

Crop Cultivation	Frequency	Percent
i. No Land	72	20.3
ii. Yes	250	70.6
iii. No	32	09.0
Total	354	100
Types of Crops		
i. No Land	72	20.3
ii. Wheat	51	14.4
iii. Maize	4	01.1
iv. Wheat and Maize	191	54.0
v. Wheat, Maize & Mustard	4	01.1
vi. No Crop Cultivation	32	09.0
Total	354	100
Income from Crops		
i. No Land	72	20.3
ii. Yes	132	37.3
iii. No	150	42.4
Total	354	100

4.1.7 CULTIVATION OF CROPS

Table 4.1.7 reveals that 70.6 percent of total population is cultivating crops. More farmers were growing crops as compared to vegetables because wheat is considered as an essential part of food in Pakistan, and results of table 4.1.7 evidenced this fact that 54% people are growing crops mainly includes wheat and Maize. These two crops are being recorded as major crops of area as they are highly suitable under the prevailing climatic conditions. These crops thus have huge contribution towards the economic well being of these areas. However, by educating local masses about modern means of cultivation and harvesting, can increase the results of their efforts. Only 29.3% (9% are not cultivating crops and 20.3% have no land) of the total population purchases grain from the market for their sustenance.

The farmers who have more land ownership also sale out the crops to local community in near market that causes their economic uplift. Some people also engaged tenets to cultivate the crops on the basis of crop sharing. The people who do not have agriculture as a major occupation also cultivate crops for their annual wheat requirements.

Table 4.1.8 Distribution of respondents by ownership of poultry, livestock, livestock types and sources of fodder and forage

Poultry	**Frequency**	**Percent**
i. Yes	264	74.6
ii. No	90	25.4
Total	354	100
Livestock Ownership		
i. Yes	254	71.8
ii. No	100	28.2
Total	354	100
Animal Types		
i. No Animals	100	28.2
ii. Buffaloes	37	10.4
iii. Cow	32	09.0
iv. Goat	44	12.4
v. Cow and Goat	29	08.2
vi. Buffaloes and cow	40	11.3
vii. Buffaloes and cow and goat	21	05.9
viii. Cow, Buffalo, Goat, Sheep, Camel, Donkey	51	14.4
Total	354	100
Fodder and Forage Sources		
i. No Animals	100	28.2
ii. Natural Vegetation	173	48.9
iii. Cultivation	11	03.1
iv. Natural Vegetation and Cultivation	41	11.5
v. Purchase	9	02.5
vi. Natural vegetation and purchase	20	05.6
Total	354	100

4.1.8 LIVESTOCK REARING

Rural population of the Margalla hills is generally an agro-pastoral society. Livestock is an integral part of their lives. Livestock types found locally include buffaloes, cows, goats, sheep, camels and donkeys. Table 4.1.8 clearly depicts that 71.8% of people had livestock at their disposal. Livestock in rural settings have a huge importance. They are source of derivatives such as milk, meat and eggs etc. They play a massive contribution to the economic well beings of the communities. Since majority of the rural people live under poverty line, therefore, it is livestock that fulfills not only their dietary requirements in the form of milk or meat and other livestock-based by-products but also insurance against economic emergencies. Livestock is also used in other local customs and traditions such as in dowry, barter trade (for exchange of other goods) and lending of milking animals (cows and goats) to poor relatives. It is also used in transportation. Different people rear different types of livestock e.g., 12.4% of the respondents were rearing goats, 10.4% buffaloes and 9.04 % cows only and 28.2% of the respondents were not having any livestock. Rest of the respondents (about 39%) were having different combinations of livestock types such as cows and buffaloes, goats and cows or "cows, buffaloes and goats" etc. as per specific needs of the particular households. People like to have poultry to meet their protein requirements through meat and eggs and also for earning income through sale of poultry.

Livestock as a whole, whether stall-fed or grazing, requires large quantity of herbs, shrubs and grasses for their survival. Livestock is only reared if natural vegetation is available to meet its feed requirements. This fact is also supported by table 4.1.8 which indicates that more than 50% of the local population meets feed requirements of their livestock from the natural flora.

Mohammad (1989) and Zaffar Uddin (1977) concluded that sheep and goats obtain about 60 percent of their feed from rangelands while the horses, donkeys and camels receive about half of their feed from rangelands. In Baluchistan 90 percent of the required livestock feed is provided by range (FAO, 1983)". Upreti (2006) conducted that natural vegetation plays an important role in the economic development.

Domestic poultry is such a blessing, which requires not much expenditure but it yields multiple benefits. The poultry business has engaged a huge fragmentation of population. The results revealed that 74.6% of the respondents were engaged in poultry business. For poultry business to be profitable, it is imperative to have good market linkages and access to reasonable poultry units. Therefore, in order to make it a profitable venture, people are needed to be educated in terms of developing important market linkages.

Table 4.1.9 Different fuel types and sources of fuel wood

Fuel Types	**Frequency**	**Percent**
i. Fuel Wood	334	94.3
ii. Dung, Coal, Electricity Heater and LPG	20	05.6
Total	354	100
Sources of Fuel wood		
i. Natural Vegetation	298	84.1
ii. Purchase	19	05.4
iii. Natural Vegetation and Purchase	37	10.5
Total	354	100

4.1.9 FUEL WOOD

The fact that how much local population is dependent on the natural vegetation is obvious from table 4.1.9. According to the results almost 94.3% of the respondents met their household energy requirements from the fuel wood obtained from natural vegetation while a small portion (5.65%) use other sources of fuel such as dung, coal, electricity or LPG.

About 84.1% of the respondents depend on natural vegetation for fuel while rest of the respondents used both purchased wood as well as natural vegetation. Anon (1980) noticed that more than one third of the world population used fuel wood to cook food or for other domestic energy use. The high fuel wood dependency also shows the energy situation of the area. The country is also suffering with the same energy crisis. The similar situation can be encountered in this area. The huge dependency on natural vegetation for obtaining this fuel wood, although provides people with the energy needs but puts the natural vegetation in huge jeopardy. The area also seems to be lacking in use of alternate energy source such as biogas and solar system. Many biogas plants can be installed in these areas. This would also help in reducing the pressure on natural vegetation considerably.

The data also revealed that 5.4% of the respondents obtain their fuel wood by purchasing from market. This also shows that people even have to pay for obtaining fuel wood to meet their energy requirements. In this way, a considerable proportion of their income is being spent on fuel wood. Non-utilization of suitable alternate energies in the area, therefore has taken a toll not on the long term environmental benefits but also on the economic well being of the area.

Some households are not only obtaining fuel wood directly from natural vegetation but also by purchasing it from relevant sources. There were 10.50% of the respondents who were found not only obtaining fuel wood from natural vegetation but also by purchasing from the market. This again provides an indication of energy shortages in this area. Thus there should be a campaign to explore alternate sources of energy for these areas because there is very little portion of energy contribution by other sources. This contribution stands at 5.65%, as according to respondents of the research.

Firewood is the main source of domestic energy and is used for cooking and heating. The field surveys conducted by Wapda/Gtz (1997) found that 99.6 per cent of all respondents used firewood as fuel for domestic purposes. The mean consumption of firewood was found to be 755 kilograms per household per month during the summer and 1,172 kilograms in winter.

Table 4.1.10 Distribution of respondents by different uses of timber in detail

Sources of Timber	Frequency	Percentage
i. No Timber Used	120	33.9
ii. Natural Vegetation	131	37.0
iii. Purchase	47	13.3
iv. Natural Vegetation and Purchase	56	15.9
Total	354	100
Timber Type		
i. No Use Of Timber	120	33.9
ii. Roofing	34	09.6
iii. Window	16	04.5
iv. Door	22	06.2
v. All Above	162	45.8
Total	354	100
Timber Use in Last 12 Months		
i. No Use of Timber	120	33.9
ii. Yes	70	19.8
iii. No	164	46.3
Total	354	100
Condition of Residence of the Respondents		
i. Paved	104	29.3
ii. Semi-paved	171	48.3
iii. Unpaved	79	22.3
v. Paved	104	29.3
iv. Total	354	100
Use of Timber in Residence of the Respondents		
i. Yes	234	66.1
ii. No	120	33.9
Total	354	100
Ownership of livestock shed		
i. Own Livestock Shed	229	64.7
ii. No Livestock Shed	125	35.3
Total	354	100
Use of Timber in Residence of the Live Stock		
i. Yes	181	51.1
ii. No	48	13.5
iii. No livestock shed	125	35.3
Total	354	100
Condition of the Residence of Livestock Shed		
i. Paved	37	10.4
ii. Semi-paved	53	14.9
iii. Unpaved	139	39.2
iv. No livestock shed	125	35.3
Total	354	100

4.1.10 TIMBER

Table 4.1.10 summarizes the results that 70% of families are using timber for the construction of their houses and making livestock sheds. The major source of timber in hilly areas like Margalla hills comes from natural vegetation. Table 4.1.10 displays the picture of timber type distribution e.g., 45.8% of the families of total population utilize timber for roofing, windows and doors collectively whereas 9% of the population use timber for their roofing purposes only.

Livestock sheds are considered as a compulsory component of construction in rural areas of Pakistan. In Table 4.1.10, it is evident that more than 64.7% of local populations have livestock sheds. During the data collection it was observed that some families have livestock sheds without animals. Because these families are involved in the trading of animals therefore they required to have their own shed. Table 4.1.10 also indicates that 39.2% of households have unpaved life stock shed and 14.9% have semi paved sheds. Only small portion of farmers i.e. 10.4% have the facility of paved livestock shed for their animals. The reason behind this phenomenon is that majority of people are living in semi and unpaved houses then how would it be possible for them to provide paved sheds for their animals. Similarly, Khattak (1995) estimated that approximately 4 percent of all houses in the village are renovated or reconstructed each year and for that purpose 30 m^3 per house of standing trees volume are needed. The results revealed that 37% of respondents were of the view that natural vegetation is the source of timber. This was a huge proportion as compared to other sources. This puts an enormous pressure on natural vegetation. The natural ecosystem of that area not only supports the livelihood and protection of the local communities but also the wildlife and birds of the area. The

degradation of this natural vegetation is therefore a threat to the existence of these wildlife and birds. According to Table 4.1.10, 33.9% of the respondents' do not use timber. The major use of timber is for Roofing, Windows and Doors. This proportion represents the remaining group which depends heavily on the timber. It also shows that timber intensive houses constructions have not completely been stopped.

According to results, 33.9% of the respondents have not used timber within the last months. This provides a good picture up to some extent, as a relatively high proportion of the respondents have not been using timber for the last 12 months. However, consistency in attitudes of the people in terms of not using timber would be much beneficial.

Usually for timber purpose big trees are used and that cause major deforestation. If alternative parameters will not be adopted by local community, private and public sector then it cause the high deforestation in Margalla hills forest. Another option to prevent the deforestation is cultivation of new plants in season. If different stake holders take interest in cultivation of compatible species against cutting of each tree, it also compensates the high deforestation of local forests.

Table 4.1.11 Distribution of respondents by use, purpose and types of hedges

Use of Hedges	Frequency	Percent
i. Yes	186	52.5
ii. No	168	47.5
Total	354	100
Purpose of Hedges		
i. No Use Of Hedges	168	47.5
ii. Household Protection	59	16.6
iii. Crop Protection	77	21.7
iv. Animal Corals Protection	5	01.4
v. Boundary Demarcation	2	00.5
vi. All Above	43	12.1
Total	354	100
Types of Hedges		
i. No use of hedges	168	47.5
ii. Natural Vegetation	170	48.0
iii. Protection Wires	6	01.7
iv. Natural Vegetation and Protection wires	10	02.8
Total	354	100

4.1.11 HEDGES

Villagers cut thorny vegetation or unpalatable shrubs and put them around their agricultural fields in the form of barriers. These vegetative barriers are called 'hedges'. Natural vegetation in the form of hedges also provides security to local community. These hedges protect their agricultural fields from grazing animals and trespassing people. Data presented in table 4.1.11 reveals that 52.5% of the total families are using hedges for different security purposes by using locale shrubs. The research also revealed

that hedges being mostly used for the purpose of house protection and crop protection. According to results, 16.6% of respondents replied that hedges are used for house protection, 21.7% of respondents said that they used for crop protection and 47.5% of respondents who responded that they do not use hedges at all. The crop protection therefore utilizes major portion of hedges. Hedges can be very effective in terms of protecting crops against animals and at the same time it is very cost consuming. The other means such as mesh wirings are very expensive and therefore unaffordable by the rural populations.

Furthermore, all over the rural areas of Pakistan in general and in Margalla Hills in particular, local inhabitants frequently use natural vegetation for demarcation of their boundaries, protection of households and for the construction of animal corals. They found natural vegetation a cheaper and readily available source for this purpose. Weerawardena (1990) emphasized the use of live fences due to high costs of conventional poles and wires. Fournier (2000) also emphasized the use of hedges in crops and house protection. However, the results revealed that people also use protection wires in place of hedges in order to provide protection to their crops and houses. But their usage is absolutely negligible, as 01.7% of the respondents were using protection wires in places of hedges and 2.8% of the respondents belonged to the category that uses protection wires and hedges both for protection and boundary delineation purposes.

Table 4.1.12 Distribution of respondents regarding use and source of non timber forest products

Use of Miswak	Frequency	Percent
i. Yes	341	96.3
ii. No	13	03.7
Total	354	100
Source of Miswak		
i. No Miswak Use	13	03.7
ii. Natural Vegetation	317	89.5
iii. Purchase	12	03.4
iv. Natural Vegetation and Purchase	12	03.4
Total	354	100
Use of Honey		
i. Yes	237	66.9
ii. No	117	33.1
Total	354	100
Source of Honey		
i. No Use of Honey	117	33.1
ii. Natural Vegetation	106	29.9
iii. Purchase	74	20.9
iv. Natural Vegetation and Purchase	57	16.1
Total	354	100
Use of Wild Fruits and Vegetables		
i. Yes	121	34.2
ii. No	233	65.8
Total	354	100
Source of Wild Fruits and vegetables		
i. No Use of Wild Fruits and Vegetables	233	65.8
ii. Natural Vegetation	58	16.4
iii. Purchase	34	09.6
iv. Both	29	08.2
Total	354	100

4.1.12 NON TIMBER FOREST PRODUCTS

Natural vegetations apart from timber and fuel wood also provides variety of services to human life, for example one of the most relevant daily life necessities is Miswak (a sort of tooth brush) and a delicate and lofty branch of Acacia (locally called *Phulai*) is cut and used as a tooth brush or Miswak. Regular use of Miswak provides safety and durability to the teeth and therefore prevent an individual from sever diseases related to gums, teeth and stomach. Miswak has the ability to kill the bacteria of our teeth and mouth. Different findings show that Miswak has been used for centuries by Sub Saharan African communities (poorest of the world who cannot afford to buy tooth paste and brush) to keep their teeth healthy. In the Middle East, people also used the roots of the different species for Miswak purpose. Data given in table 4.1.12 revealed that 96.3% local inhabitant's use Miswak from the natural vegetation. Almas (1999) emphasized that natural vegetation is most beneficial for human beings.

Natural honey is another non-timber forest product, also found in the forest areas of Margalla hills. Natural honey is highly valued by the people all over the globe and used for medicinal and nutritional purposes. Forests are the major source of honey everywhere. The scrub forests of Margalla hills are rich habitat of honey bees.

Data in Table 4.1.12 reveals that the entire rural population prefer to use honey for medicinal and nutritional purposes; 67% of the local population used honey and get it from the wild timber while rest of the 33% of respondents do not use honey. Likewise honey and natural vegetation also fulfills the nutritional requirements of the rural areas in the form of fruits, berries and vegetables. Almost 16.4% of the local communities and particularly those who are economically deprived use variety of natural vegetation for

fruits and vegetables. Even 9.6% people buy such fruits and vegetables either from other people or from the local market. Ahmad (2006) also emphasized the importance of non timber products in Kalash. Similarly, Sheikh (1987) also stressed that non timber products play a massive role in Pakistan. The source of honey, as revealed by the results, was natural vegetation. According to 29.9% of respondents, the major source of honey is natural vegetation. Thus, any pressure on natural vegetation will also put pressure on its derivatives such as honey etc.

Table 4.1.13 Distribution of respondents by use, purpose and source of plants utilized for medication purposes

Use of Medicinal Plants	**Frequency**	**Percent**
i. Yes	137	38.7
ii. No	217	61.3
Total	354	100
Purpose of Medicinal Plants		
i. No Use of Medicinal Plants	217	61.3
ii. Own Medication	53	15.0
iii. Live Stock	8	02.3
iv. Own Medication and Live Stock	76	21.5
Total	354	100
Source of Medicinal Plants		
i. No use of Medicinal Plants	217	61.3
ii. Natural Vegetation	79	22.3
iii. Purchase	13	03.7
iv. Natural Vegetation and Purchase	45	12.7
Total	354	100

4.1.13 MEDICINAL PLANTS

It is known fact that plants are major source of medicines throughout the world. Use of natural vegetation as herbal medicines both for human and livestock is in vogue since ages. The indigenous knowledge concerning use of medicinal flora is transferred from generations. Quite often rural communities prefer and cure their sick livestock from medicinal plants in forests. Even for the treatment of human diseases, medicinal plants are frequently used.

Table 4.1.13 gives results that overall 137 families are using medicine plants for their own use and livestock. WWF-Pakistan also conducted similar studies and documented the response of various people about variety of medicinal plants of Margalla hills. Ahmad and Hussain (2008) stressed that medicinal plants have been embedded as a rich tradition in lives of local communities residing in salt range. Zaidi (1998) also suggested that medicinal plants are valuable natural vegetations and considered as potentially safe drugs. Similarly, Ogunyemy (2005) also concluded that local communities in Africa utilize medicinal plants obtained from forest areas for preparing medicines for humans and livestock as well.

Despite the huge benefits associated with medicinal plants, 61.3% respondents were not using medicinal plants. This also shows the negligence and lack of knowledge of the local communities towards medicinal plants. In order to get maximum benefit from the meditational plants of natural vegetation, the knowledge in terms of their utilization is imperative. This indigenous knowledge is unfortunately also fading away in different rural societies of Pakistan. There were about 22.3% respondents which were of the view that natural vegetation serves as a major and only source of medicinal plants in the area. At the same time, only a very small fragmentation (03.7%) of the population is

purchasing medicinal plants from local people, where as considerable portion of population (12.7%) takes both medicinal plants from natural vegetation and from the market. Here it is necessary to mention that local people who are involved in the business of different products of natural vegetation also take these products directly from local forest.

Table 4.1.14 Distribution of respondents by use of herbs utilized for medication purposes

Vernacular Name	Scientific Name	Status	F	Purpose			Result	
				Description	F	%	F	%
i. Brahmi Booti	*Centella Asiatica*	-	-	No Use of Medicinal Plants	217	61.3	217	61.3
		No Use of Medicinal Plants	217	Own Medication	71	20.0	61	17.2
		Yes	22	Livestock	48	13.6	58	16.4
		No	115	Both	18	05.1	18	05.1
		Total	354	Total	354	100	354	100
ii. Dhodal	Euphorbia Heliscopia	-	-	No Use of Medicinal Plants	217	61.3	217	61.3
		No Use of Medicinal Plants	217	Own Medication	88	24.9	59	16.7
		Yes	24	Livestock	34	09.6	66	18.6
		No	113	Both	15	04.2	12	03.4
		Total	354	Total	354	100	354	100
iii. Lehli	Convolvulus Arvensis	-	-	No Use of Medicinal Plants	217	61.3	217	61.3
		No Use of Medicinal Plants	217	Own Medication	97	27.4	53	15.0
		Yes	58	Livestock	25	07.1	63	17.8
		No	79	Both	15	04.5	21	5.9
		Total	354	Total	354	100	354	100

F = Frequency

4.1.13.1 MEDICINAL HERBS

Beginnings from history human beings are using hers for medication purposes. Almost all rural societies of world, the use of medicinal herbs occur in different forms. Herbs are used in different forms like abstract, juice, leaves and roots. In table 4.1.14 different hurabs which are being used in Margalla hills are discussed I detail separately.

The *Centella Asiatica,* which is commonly called as Brahmi Booti, is a herbaceous plant. It has been known for its various medicinal benefits such as It has been used for wound healing, better circulation, memory enhancement, cancer, vitality, general tonic, respiratory ailments, detoxifying the body, treatment of skin disorders etc. The parts used for this plant are mostly the leaves. The results revealed that almost 17% of the population was using this respective herb for livestock medication and 18% uses it for human medication.

The *Euphorbia Helioscopia*, locally called as Dhodal, is a herb. The medicinal attributes include febrifuge and vermifuge. Leaves, stems and roots of this plant are used for medicinal purposes. The results revealed that 19% of respondents are using the forb for livestock medication whereas 17% of the respondents use this forbs for human medication.

The *Convolvulus Arvensis* is a herb and locally called as Lehli. It is used as purgative and reducing fever. The whole plant is used for medicinal purposes. According to results, 15% of respondents use this herb for human medication and 18% use this for livestock medication.

Table 4.1.15 Distribution of respondents by use of trees utilized for medication purposes

Vernacular Name	Scientific Name	Status	F	Purpose			Result	
				Description	F	%	F	%
i. Phulai	Acacia Modesta	-	-	No Use of Medicinal Plants	217	61.3	217	61.3
		No Use of Medicinal Plants	217	Own Medication	84	23.7	45	12.7
		Yes	86	Livestock	36	10.2	67	19.0
		No	51	Both	17	04.8	25	7.1
		Total	354	Total	354	100	354	100
ii. Shirin	Albizzia Lebbek	-	-	No Use of Medicinal Plants	217	61.3	217	61.3
		No Use of Medicinal Plants	217	Own Medication	91	25.7	56	15.8
		Yes	44	Livestock	29	08.2	53	15.0
		No	93	Both	17	04.8	28	07.9
		Total	354	Total	354	100	354	100
iii. Kameela	Mallouts Philippiensis	-	-	No Use of Medicinal Plants	217	61.3	217	61.3
		No Use of Medicinal Plants	217	Own Medication	76	21.5	47	13.3
		Yes	82	Livestock	42	11.9	75	21.2
		No	55	Both	19	05.4	15	04.2
		Total	354	Total	354	100	354	100
iv. Kanga	Pistacia Chinesis	-	-	No Use of Medicinal Plants	217	61.3	217	61.3
		No Use of Medicinal Plants	217	Own Medication	77	21.8	50	14.1
		Yes	70	Livestock	44	12.4	72	20.3
		No	67	Both	16	04.5	15	04.2
		Total	354	Total	354	100	354	100
v. Daruna	*Punica Granatum*	-	-	No Use of Medicinal Plants	217	61.3	217	61.3
		No Use of Medicinal Plants	217	Own Medication	96	27.1	39	11.0
		Yes	85	Livestock	23	06.5	77	21.7
		No	52	Both	18	05.1	21	05.9
		Total	354	Total	354	100	354	100

F = Frequency

4.1.13.2 MEDICINAL TREES

The *Acacia modesta* is a tree and locally called as Phulai. They are used as antioxidants. The stems of the tree are used for medicinal purposes. According to results, 13% of the respondents use Phulai for human medication and 19% use it for livestock medication.

The *Albizia lebbek* is a tree and locally known as Shirin. It is used to treat flu, cough and lung problems. The leaves and seeds of this tree are used for medicinal purposes. According to results, 16% each of the respondents have favored the respective tree for human and livestock medications.

The *Mallotus Philippinensis*, locally called as Kameela, is a tree. It is used as anthelmintic, to deal with dermal problems and infectious wounds. All parts of this tree are used for medicinal purposes. According to the results, 14% of the respondents use this tree for livestock medication and 22% of the respondents use this tree for human medication.

The *Pistacia Chinensis*, locally called as Kanga, is a tree. It is used for treating asthma, phthisis, dysentery and chronic bronchitis. The resin extracted from the tree is used for medicinal purposes. According to the results, 15% of the respondents use this tree for human medication and 21% of the respondents use this tree for livestock medication.

The *Punica Granatum*, locally called as Daruna, is a tree. It helps in treating the following; diarrhea, dysentery and intestinal parasites etc. The rind of the fruits and barks of this tree are mainly utilized for medicinal attributes. Seeds of its fruits are also utilized for medicinal purposes. The results revealed that almost 22% of the respondents were using Daruna for livestock medication whereas 11% use this tree for human medication.

Table 4.1.16 Distribution of respondents by use trees utilized for medication purposes

Vernacular Name	Scientific Name	Status	F	Purpose			Result	
				Description	F	%	F	%
i. Kao	Obea Ferruginea	-	-	No Use of Medicinal Plants	217	61.3	217	61.3
		No Use of Medicinal Plants	217	Own Medication	76	21.5	38	10.7
		Yes	104	Livestock	38	10.7	70	19.8
		No	33	Both	23	06.5	29	08.2
		Total	354	Total	354	100	354	100
ii. Amaltas	*Cassia Fistula*	-	-	No Use of Medicinal Plants	217	61.3	217	61.3
		No Use of Medicinal Plants	217	Own Medication	84	23.7	71	20.1
		Yes	44	Livestock	38	10.7	45	12.7
		No	93	Both	15	04.2	21	05.9
		Total	354	Total	354	100	354	100
iii. Bohr	*Ficus benghalensis*	-	-	No Use of Medicinal Plants	217	61.3	217	61.3
		No Use of Medicinal Plants	217	Own Medication	79	22.3	57	16.1
		Yes	78	Livestock	41	11.6	72	20.3
		No	59	Both	17	04.8	8	2.3
		Total	354	Total	354	100	354	100

F = Frequency

Table 4.1.16 also shows the use of different tree species for medication purposes in study area. The *Olea Ferruginea* is a tree, and locally called as Kao. It is used for treating diabetics. Leaves and fruits of this tree is used for medication. The results revealed that 11% of the respondents use this tree for human medication and 20% of the respondents use this tree for livestock medication. The *Cassia fistula* is a tree and locally known as Amaltas. Roots, barks, seeds and leaves are used as medicinal purposes. According to the results, 21% of the respondents use this tree for human medication and 13% of the respondents use it for livestock medication. The *Ficus benghalensis* is a tree and is locally known as Bohr. Leaves, seeds and stems of this respective tree are used for medicinal purposes. According to results, 17% of the respondents use this tree for human medication and 21% of the respondents use for livestock medication.

Table 4.1.17 Distribution of respondents by use of shrubs utilized for medication purposes

Vernacular Name	Scientific Name	Status	F	Purpose			Result	
				Description	F	%	F	%
i. Bhaikar	*Justicia adhatodea*	-	-	No Use of Medicinal Plants	217	61.30	217	61.4
		No Use of Medicinal Plants	217	Own Medication	74	20.90	45	12.7
		Yes	69	Livestock	41	11.60	71	20.0
		No	68	Both	22	06.20	21	05.9
		Total	354	Total	354	100	354	100
ii. Arind	*Ricinus communis*	-	-	No Use of Medicinal Plants	217	61.30	217	61.3
		No Use of Medicinal Plants	217	Own Medication	71	20.1	80	22.6
		Yes	34	Livestock	39	11.0	39	11.0
		No	103	Both	27	07.6	18	05.1
		Total	354	Total	354	100	354	100
iii. Kuchmach	Solanum Nigrum	-	-	No Use of Medicinal Plants	217	61.3	217	61.3
		No Use of Medicinal Plants	217	Own Medication	96	27.1	43	12.1
		Yes	95	Livestock	25	07.1	67	18.9
		No	42	Both	16	04.5	27	07.6
		Total	354	Total	354	100	354	100
iv. Sunmloo	Berberis Lycemus	-	-	No Use of Medicinal Plants	217	61.3	217	61.3
		No Use of Medicinal Plants	217	Own Medication	82	23.2	38	10.7
		Yes	115	Livestock	14	04.0	63	17.8
		No	22	Both	41	11.6	36	10.2
		Total	354	Total	354	100	354	100
v. Granda	Carissa Opaca	-	-	No Use of Medicinal Plants	217	61.3	217	61.3
		No Use of Medicinal Plants	217	Own Medication	75	21.1	42	11.9
		Yes	112	Livestock	22	06.2	73	20.6
		No	25	Both	40	11.3	22	06.2
		Total	354	Total	354	100	354	100

F = Frequency

4.1.13.3 MEDICINAL SHURUBS

The *Berberis Lycium* is a shrub and is locally known as Sunmloo. It is used in the treatment of eyes and diarrhea. Fruits, roots and barks of this shrub are used for medicinal purposes. According to the results, 11% of the respondents use this shrub for human medication and 18% of the respondents use it for livestock medication.

The *Ricinus communis* is a shrub and is locally known as Arind. It is used as purgative and against headaches. Leaves and seeds of this shrub are used for medicinal purposes. According to results, 23% of respondents use this shrub for human medication and 11% of respondents use it for livestock medication.

The *Justicia adhatoda* is a shrub and is locally known as Bhaikar. It is used for treating respiratory tract. The parts of this respective shrub used for medicinal purposes include the following; leaves, roots, flowers and barks. According to results, 21% of the respondents use this shrub for human medication and 12% of the respondents use this shrub for livestock medication.

The *Solanum Nigrum* is a shrub, and locally called as Kuchmach. It is used to treat asthma, dysentery and fever. The whole plant is used for medicinal purposes. According to results, 13% of the respondents use this shrub for human medication and 19% use it for livestock medication.

The *Carissa Opaca,* locally called as Granda, is a shrub. It is used in treating asthma, cardiac disorders, and treating cough. The stems, leaves and fruits of this shrub are used for medicinal purposes. According to the results, almost 21% of the respondents use this shrub for livestock medication while 12% of the respondents use this shrub for human medication.

Table 4.1.18 Distribution of respondents by use of different farm implements

Type of Cultivation	Frequency	Percent
i. No use of farm implements	63	17.8
ii. Traditional	70	19.8
iii. New Technology	137	38.7
iv. Traditional and New Technology	84	23.7
Total	354	100

4.1.14 FARM IMPLEMENTS MADE BY NATURAL VEGETATION

In rural communities, both modern and traditional ways of cultivation are used. In traditional way of cultivation people depend more on natural vegetation for preparation and use of their farm implements. For these implements wood from the natural forests is invariably used. The social change and advancement of technology has affected the way of farming. Now farmers used new verities of seeds for crops and vegetables, new farm implements for sowing and harvesting the crops.

As table 4.1.5 shows that 20.3% people have no land, table 4.1.18 also justify that 17.8% people are not using any type of Implements. However 19.8% people are using traditional type of implements which are made by natural vegetation. There is a large number of farmers i.e. 38.7% is using new technology for cultivation process. . The level of technology used for cultivation in any particular area depends on the education of community. In sturdy area 23.7% farmers are using both implements. Due to hilly area landscape, traditional implements are more beneficial for farmers because they are easy to carry and approach hard areas.

Table 4.1.19 Distribution of respondents by use of different implements for farming made from natural vegetation

Farm Implements	Vernacular Name	Status	F	%	Farm Implements	Vernacular Name	Status	F	%
i. Wooden handles	*Kelay*	N.U	63	17.8	vii. Wooden plank	*Majh*	N.U	63	17.8
		Yes	133	37.6			Yes	65	18.4
		No	158	44.6			No	226	63.8
		Total	354	100			Total	354	100
ii. Wooden pegs	*Dastay*	N.U	63	17.8	viii. Wooden spade	*Karai*	N.U	63	17.8
		Yes	148	41.8			Yes	65	18.4
		No	143	40.4			No	226	63.8
		Total	354	100			Total	354	100
iii. Wooden rake (2 & 3 prongs)	*Trangal & Sangal*	N.U	63	17.8	ix. Wooden blade (leveler)	*Karah*	N.U	63	17.8
		Yes	119	33.6			Yes	101	28.5
		No	172	48.6			No	190	53.7
		Total	354	100			Total	354	100
iv. Wooden rake	*Pohra*	N.U	63	17.8	x. Hand hoe for looping tree branches	*Dhanga*	N.U	63	17.8
		Yes	127	35.9			Yes	78	22.0
		No	164	46.3			No	213	60.2
		Total	354	100			Total	354	100
v. Wooden plough	*Hull*	N.U	63	17.8	xi. Donkey cart	*Rahra*	N.U	63	17.8
		Yes	148	41.8			Yes	31	08.8
		No	143	40.4			No	260	73.4
		Total	354	100			Total	354	100
vi. Yoke	*Punjali*	N.U	63	17.8	xii. Wooden coach box	*Jandri*	N.U	63	17.8
		Yes	113	31.9			Yes	48	13.6
		No	178	50.3			No	243	68.6
		Total	354	100			Total	354	100

F = Frequency

4.1.14.1 DIFFERENT TYPES OF FARM IMPLIMENTS MADE FROM NATURAL VEGETATION

Table 4.1.19 describes the frequency and percentage of different farm implements used traditionally for sowing, harvesting, and carriage purposes and for livestock. Results indicate a positive trend towards the use of traditional ways of cultivation whereby farm implements are prepared from the naturally grown wood plants. Andrade and Jenkins 2003 concluded that natural vegetation is most significant for local communities of Mexico. As evident from table 4.1.18 that 17.8% farmers are not using any type of implements therefore in table 4.1.19, N.U (not used) against each implement refer to these people.

4.1.14.1.1 IMPLIMENTS USED FOR SOWING PURPOSE

In table 4.1.19 wooden plough, yoke, wooden plank are used for sowing purposes. These implements are used with the help of domestic animals. Especially cows are used for that purpose. Results shows that 41.8% farmers are using wooden plough for ploughing the land while 31.9% used the yoke to connect the pair of animals for ploughing. While 18.4% people are using the wooden plank to make the soil suitable for sowing.

4.1.14.1.2 IMPLIMENTS USED FOR HARVESTING PURPOSE

Wooden rake with two or three prongs are used for moving the crops from one to another place. Results from table 4.1.19 shows that 33.6% people are using that implement for harvesting purpose. Another traditional implement made from natural vegetation wooden spade is also used by local farmers. That implement is used to separate the seeds and 18.4% people are using wooden spade locally. Wooden blade is used to level the land after cutting the crops.

4.1.14.1.3 IMPLIMENTS USED FOR TRANSPORTATION PURPOSE

Wooden coach box and donkey cart is used for transportation purpose. Especially in hilly areas wooden coach box has much importance as an animal can easily transport the goods in difficult ways. Results show that 13.6% people are using coach box made from natural vegetation for transportation purpose.

4.1.14.1.4 IMPLIMENTS USED FOR LIVESTOCK

Wooden handles are used to tie the animals in homes. Results show that 37.6% of farmers are using wooden handles in their farms for their livestock. Where hoe for looping tree branches hand is used for collection of tree branches for goats. Total 22% of local farmers are using that implement for above mentioned purpose.

Table 4.1.20 Distribution of respondents by use of domestic products made from natural vegetation

Use Of Domestic Products	Frequency	Percent
i. Yes	291	82.2
ii. No	63	17.8
Total	354	100

4.1.15 DOMESTIC PRODUCTS MADE BY NATURAL VEGETATION

Natural vegetation is also indirectly used for different domestic uses. By using different domestic products made from natural vegetation decreases the expenditure of consumer as it has certain market value. And that product is free provided by natural vegetation. Results of table 4.1.20 are very appreciating where a large portion (82.2%) of local population is using domestic products made from natural vegetation. These products are made by local villagers with the help of indigenous knowledge transferred from there ancestors there using these products is also to preserve and practice their culture.

Table 4.1.21 Distribution of respondents by use of domestic products made from na

Products	Vernacular Name	Status	F	%	Products	Vernacula Name
i. Wooden pen	Kalam	N.U	63	17.8	vii. Wooden ladder	Parsang
		Yes	188	53.1		
		No	103	29.1		
		Total	354	100		
ii. Sticks	Soti	N.U	63	17.8	viii. Wooden mesher	Gohtna
		Yes	272	76.8		
		No	19	05.4		
		Total	354	100		
iii. Charpoy	Charpai	N.U	63	17.8	ix. Wooden churner	Madhani
		Yes	271	76.6		
		No	20	05.6		
		Total	354	100		
iv. Wooden weaven stool	Piheri	N.U	63	17.8	x. Wooden churner's stand	Nihni
		Yes	255	72.0		
		No	36	10.2		
		Total	354	100		
v. Basket	Tokra	N.U	63	17.8	xi. Wooden roof drain	Prenala
		Yes	226	63.8		
		No	65	18.4		
		Total	354	100		
vi. Broom	Jahroo	N.U	63	17.8	xii. Table & Chair	Maize kurs
		Yes	264	74.6		
		No	27	07.6		
		Total	354	100		

F = Frequency

4.1.15.1 DIFFERENT TYPES OF DOMESTIC PRODUCTS MADE FROM NATURAL VEGETATION

Different domestic products are made by natural vegetation are frequently use by the villagers .These product provide huge compensation because they just have value added cost for villagers. Some products are directly provided by the natural vegetation in the useable farm such as wooden pen, sticks, wooden masher, broom etc. However some other products are obtained in raw form and carpenter brings them in useable form without any cost in some places through barter system.

As the results from table 4.1.21 shows that some products are frequently in use by different families whereas other product are no so in operation by local families whereas 17.80% families have left their cultural practices and started depending on modern technology to meet their daily domestic requirements. Sheikh (1987a) also emphasized that minor forest products are spread throughout the country, although statistically complete account of NTFP is not possible, but NTFPs certainly playing huge role in the lives of people in Pakistan.

The use of domestic products made by natural vegetation compensates the users in decreasing the household expenditure. As these products have valuable cost in market. Use of domestic products also indicates cultural practices of local community because the art to change raw material in useable form is indigenous.

Andel (2006) also emphasized that non timber products i.e. wild plants and animals, are two important sources of livelihood for communities of Ethopia, Central and South Africa. He further stressed that NTFPs plays a massive role in economic development of these countries.

Table 4.1.22: Distribution of respondents by tourist visit, tourism season and income related to tourism

Tourists Visits	Frequency	Percent
i. Yes	212	59.9
ii. No	142	40.1
Total	354	100
Tourist Visit Season		
i. No Tourist visit	150	42.4
ii. Winter	11	03.1
iii. Spring	39	11.0
iv. Summer	104	29.4
v. All Season	50	14.1
Total	354	100
Tourism Income (Rs)		
i. No Tourist Income	336	94.9
ii. Up to 5000	13	03.7
iii. Above 5000	5	01.4
Total	354	100

4.1.16 TOURISM

Aesthetic feeling of human being is in practice for ages. It is a worldwide phenomenon and practiced everywhere in the world. Now modern technology and invention of many electronic devices have bound the people for indoor recreational activities. Use of machinery has also assisted the human beings to approach them on lofty but hard in approach places.

Tourism is enlisted on top in the list of beneficial industry within developed countries .Pakistan is also considered a hot cake due to its glamour and different series of mountainous chains. Margalla Hills National Park is a beautiful resort Peer Sohawa, Daman-e-Koh and Monal restaurant are attractive places for people of twin cities. Those people who came to visit Islamabad are obliged to visit above mentioned places. Government's least interest in the development of Margalla tourism has deprived the visitors. From alluring places and local communities from prosperity results also favor the tourism. According to the table 4.1.22 almost 60% respondents have witnessed the presence of tourists. Here, it is essential to mention that Kotla, Gokina khurd and Kalan are nearest village to tourist resort and rest of villages is deprived from this advantage. Because there is no tourist approach in rest of the Margalla hills only for those who have interest for hacking and adventures. Results in table 4.1.22 also depict that only summer season is considered more delicious for those who have curiosity to expose Margalla hills. In the context of Margalla tourism it is crucial to dilate the miserable effects of those very lucrative phenomena on local community. According to results in second portion of table 4.1.22, 30% of the respondents have responded that summer is the most preferred season by the tourists. And, according to the last portion of table the income generation from the tourism in the area is absolutely negligible, 95% of the respondents have responded that there is no income from tourism in this area.

Himayatullah (2003) concluded that people of Margalla Hills National Park depend highly on its various derivatives. However, the major being currently the tourism sector, but ecological attractiveness if used utilized sustainably can also contribute effectively in socio-economic well-being of respective communities.

Table 4.1.23 Distribution of respondents by different services provided by villagers to tourists

Services Provided by Villagers to Tourists	Frequency	Percent
i. No Tourist Visit	140	39.5
ii. Tourist Guide	15	04.2
iii. Handy Crafts	9	02.5
iv. Honey	3	00.8
v. Livestock	2	00.6
vi. Potter	2	00.6
vii. Meals	7	02.0
viii. Paying Guest	2	00.6
ix. Dairy and Eggs	5	01.4
x. Refreshments	91	25.7
xi. Flowers and Buckeyes	2	00.6
xii. No Services	76	21.5
Total	354	100

4.1.16.1 SERVICES RELATED WITH TOURISM

According to results described in table 4.1.23, almost 40% of the respondents were of the view that there are no tourists visiting the area. The area also does not provide good services for the visiting tourists. This is depicted by the results that only 4% of the tourist guides are offered to the visiting tourists by the area. Similarly, there are only 3% of handy crafts developed and produced in this area. This shows the poor business related to handy crafts and at the same time it shows the poor management in terms of preserving the local heritage of this area. Table 4.1.23 depicts that only 25.7% of total population is involve in taking benefits in the form of selling refreshments to visitors where rest of the population is adding nothing from that beneficial activity. As it is mentioned above that depress condition is only due to lack of tourist development in Margalla hills. This shows

that there are small shops available which have these refreshments sold to tourists who visit these areas. But as there is only small number of tourists visiting this area, therefore people here are reluctant in opening small refreshment shops, otherwise as figure suggests this could be a good business opportunity for the local communities.

There were 22% of respondents who responded that there are no services provided in the area. This is quite understandable as the tourist flux in the area is less. Thus, even the services which are offered in this area also go unnoticed. However, the area has good potential to attract good numbers of tourists but requires sincere efforts in order to achieve this.

Table 4.1.24 Distribution of respondents by jobs related with tourism

Tourism Related Jobs	Status	Frequency	Percentage
i. Tourist Guide	Yes	4	01.1
	No	350	98.9
	Total	354	100
ii. Forestry and Wildlife	Yes	4	01.1
	No	350	98.9
	Total	354	100
iii. Hotelling	Yes	5	01.4
	No	349	98.6
	Total	354	100
iv. NGO	Yes	1	00.3
	No	353	99.7
	Total	354	100

4.1.16.2 JOBS RELATED WITH TOURISM

According to results in table 4.1.24, 99% of the respondents were of the view that there are no tourist guides in the area, whereas only 1% of respondents hold view that there are tourist guides in the area. In order to improve socio-economic conditions of the area, it is most important to first build some basic amenities in the area and then attract outside visitors. After having achieved these things, the tourist guide opportunities could become good source of income for local people and even the local people would get attracted towards this opportunity. By assuming this job, a sense of recognition regarding the ecological significances of the area amongst the local people could also be developed. According to results, 99% of the respondents were of the view that people are no wild life or forestry department jobs. Results also reveal that, 99% of respondents were engaged with NGOs. And, only 1% of the people were of the view that people are engaged with different NGOs. The employment in NGOs very much depends on the literacy situation of the area. If the area has a good literacy rate, the changes to work in NGOs present in that particular area or nearby areas become greater. One other reason could also be that there might not be NGOs active at grass root levels in those areas, that are why are not people engaged or working with NGOs. In order to bring NGOs in the area, this is also necessary that ecological significances of the area should be projected, so more and more NGOs get aware of the importance of conserving the ecological significance of the area, and thus establish themselves in this area. Similarly, 99% of the respondents were of the view that there is no hotelling in the area and 1 % of the respondents are of the view that hotelling does exist in the area and responsible for generation of some negligible revenue.

Table 4.1.25 Distribution of respondents by different business related to natura

Name	Status	F	%	Name
i. Fodder & Forage	Yes	21	05.9	viii. Dairy Products
	No	333	94.1	
	Total	354	100	
ii. Fuel wood	Yes	25	07.1	ix. Poultry Eggs
	No	329	92.9	
	Total	354	100	
iii. Timber	Yes	9	02.5	x. Honey
	No	345	97.5	
	Total	354	100	
iv. Hedges	Yes	4	01.1	xi. Farm Implements
	No	350	98.9	
	Total	354	100	
v. Medicinal plants	Yes	4	01.1	xii. Domestic products
	No	350	98.9	
	Total	354	100	
vi. Wild Fruits and Vegetables	Yes	9	02.5	xiii. Miswak
	No	345	97.5	
	Total	354	100	
vii. Wild Animals	Yes	1	00.3	-
	No	353	99.7	-
	Total	354	100	-

F = Frequency

4.1.17 BUSINESS RELATED WITH NATURAL VEGETATION

Table 4.1.25 describes the local businesses of villagers attached with natural vegetation. Almost none of total population is attached with those businesses. The basic reason behind that astonishing process is strict rules and laws of Margalla National Management Plan implemented by local government agencies. Samina Khalil (2010) emphasized a direct relationship amongst tourism, receipts and economic expansion of Pakistan. Board of investment, Government of Pakistan (2007) has published its report in which it was discussed that the Pakistan has great potential for tourism. Similarly, Ministry of environment and board of investment also emphasized massive potential of tourism in the country.

As compared to Pakistan, Nepal is a small country and their major source of earning is tourism. Air safari in Nepal is very profitable six air lines engaged in the business, flight take off from Kathmandu airport in morning. On the other hand Pakistan has lot more to offer to foreign tourist, but there is need to plan the air safari over Hamalians. Many Sikh pilgrimage visit Pakistan every year from all over the world. In 2005, around 35000 Sikh pilgrimage visited Pakistan.

4.2 BIVARIATE ANALYSIS

Bivariate represents a two variable regression equation. The variable on the right hand side of the equation is called independent or explanatory (regressor) variable where as variable on the left hand of the equation is called Dependent or regressened variable. Bivariate analysis provides the overall picture of the relationship between dependent and independent variables and relative importance of these variables. For example, $Y= \alpha +\beta X$ is a simple form of bivariate equation (an equation comprises of only two variables) where Y is a dependent and X is an independent variable. The coefficient 'α' is constant term shows a value of for dependent

4.2.1 IMPACT OF LAND OWNERSHIP ON LIVE STOCK REARING

Hypothesis: **There is a relationship between land ownership of the respondents and livestock rearing.**

(a) More the landownership of the respondents' families more will be the livestock rearing.

Table 4.2.1 Cross tabulation between land ownership and having livestock

Land Ownership	Keeping Livestock		
	Yes Percentage (Frequency)	No Percentage (Frequency)	Total Percentage
Less than 8 Kanal	60.0 (111)	40.0(74)	52.2
More than 8 Kanal	84.6 (143)	15.4(26)	47.8
Total	71.8 (254)	28.2(100)	100
Chi Square = 26.402	df=1	Significance Level= 0.000	
Gamma = - 0.571		Significance Level= 0.000	

Live Stock has become very attractive source of earning in general and in hilly areas in particular where people have relatively less job and business opportunities. The fodder and forage are freely available in hilly areas to feed livestock. As cultivated land is a source of fodder whereas barren land (particularly in hilly areas) is the treasurer of forage in the form of herbs, shrubs, trees and grasses.

By applying statistical analysis on the source data, it has been shown in the above table 4.2.1 that the 60% of the respondents who have own land (less than 8 Kanals) have livestock and 40% don't have livestock at all. On the other hand the respondents with land more than 8 Kanals, relatively higher percentage (84.6%) have livestock while only 15.4% have no livestock. Two statistical tests (Chi-square and Gamma) were applied on the data shown in table 4.2.1 to check the level of significance between and dependent (livestock) and independent (Land ownership) variables. The results of Chi-square and

Gama test are very significant which indicates a strong direct relationship between land ownership and livestock rearing. As before in table 4.1.8 it is mentioned that in arid zones livestock is actual saving of a farmer. So that income generated by livestock is used in different household expenditures which cause the prosperity for local community.

4.2.2 USAGE OF FUELS AND EXPENDITURES OF HOUSEHOLD

Hypothesis **There is an association between types of fuel used by respondents' families and household expenditure.**

(a) Higher the use of natural vegetation as fuel, lower will be total household expenditure

Table 4.2.2 Cross tabulation between domestic fuel types and expenditure of household

Domestic Fuel	Expenditure OF Household				
	1-15000 Percentage (Frequency)	15001-20000 Percentage (Frequency)	20001-25000 Percentage (Frequency)	25001-150000 Percentage (Frequency)	Total Percentage
Fuel wood	39.8 (133)	29.0 (97)	20.7 (69)	10.5 (35)	94.3
Other Energy Sources	15.0 (3)	25.0 (5)	10.0 (2)	50.0 (10)	5.7
Total	38.4 (136)	28.8 (102)	20.1(71)	12.7 (45)	100
Chi Square = 27.387 df=3 Significance Level= 0.000 Gamma = 0.550 Significance Level= 0.004					

The table 4.2.2 depicts the relationship between expenditure of household and type of domestic fuel. Results shows that majority of the families with low expenditure class are using more natural vegetation as fuel as compared to families with high monthly expenditures. For example, in the families of expenditure class 1-15000, 39.8% are suing fuel wood where as 15% are using other sources. Similarly in the families of expenditure

class 25001-150000, 10.5% are using fuel wood and 12.7% are using other sources. On the other hand other energy sources cause the increase in expenditure which put high burden on the pocket of consumer. Natural vegetation helps the local community in their livelihood either increasing in income or by decreasing in expenditure. So the money which is saved in domestic fuel by using fuel wood can be used in education or any other benefit. The Significance level of Chi-square of Gamma is also satisfactory

CHAPTER FIVE

SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY

In the study area, majority of respondents were married and living in joint family system. The area also had strong joint family system where 6-10 was recorded as a major size of each household. The literacy rate of the area was not satisfactory, Majority of the respondents were having education less than matriculation. The economic condition of the area also does not provide any satisfactory picture where half of the households have income less than Rs. 15,000. The poor situation can also be predicted by the land ownership scenario of the area where only half of families have no land or land below 8 Kanals (both cultivated and barren). Agriculture is practiced by majority of population as major occupation and they cultivate vegetable and crops for their subsistence. The $3/4^{th}$ of the population owned poultry business and livestock and they obtained fodder and forage from natural vegetation. The area heavily depends on firewood for energy requirements. The timber usage in the area is very high. Half of the families of study area have semi paved house structures where they have utilized timber in their construction. Almost one-third of this timber has been obtained from natural vegetation. Hedges are also highly preferred in the area. As majority of respondents use hedges and obtains these hedges from natural vegetation. The major use of these hedges is to protect crops in the area.

Non Timber Forest Products are very popular among local communities. People love to use Miswak (to substitute tooth brush), Honey as an important ingredient of

nutrition and also wild fruits and vegetables. A countable number of the respondents use medicinal plants for day to day medical issues. Most of these medicinal plants are obtained from natural vegetation. The amount of timber used in traditional technologies is relatively less than the timber used in new technology, because less man power is required in new technology. The area does not have any ecotourism and there is no modern day business activities related to natural vegetation. Few areas have good places to visit and attract reasonable number of tourists every year. The names of these area are Gokina Khurd, Kalan and Kotla.

5.2 MAJOR FINDINGS

- The highest numbers of respondents were found under the age category of, 'below 25' (20.9%). The 83.6% of respondents were married, 60.2% of respondents were living under joint family system.
- There were 25.7% of respondents who were Illiterate. The highest income of the respondents was between 15.001-20,000 (27.4%). The highest household expenditure was less than 10,000.
- The most popular occupation of the respondents was agriculture (36.2%). The 46.0% of the respondents' family occupation was also agriculture.
- The distribution with respect to vegetable cultivation has shown highest increase in respondents with 22%. The distribution with respect to types of vegetables, the respondents with no vegetables had the highest percentage with 54.0%.
- There were 70.6% of the respondents who had the land for cultivation. According to results, wheat, maize and mustard together are the crops grown by 54.0% of the

respondents. There were 42.4% of the respondents who do not use their lands for income generation.

- According to ownership of poultry and livestock were 74.6, 71.8 percent respectively.
- Fuel wood was the major source of fuel, according to the views of 94.35% of respondents. Similarly, natural vegetation is the major source of fuel wood, according to views of 84.1% of respondents.
- According to results, 37% of respondents were using timber obtained from natural vegetation. This timber is used for various purposes i.e. window, door and roof making. 33.9% of respondents responded that they have not used timber in last 12 months.
- A large percentage such as 64.7% of respondents said that they had their own livestock shed.
- Almost half of the population 47.5% of respondents was using wood for purpose of hedges, 16.6% of household use hedges for protection. According to 48.0% of respondents, wood is used as a hedge type.
- According to 96.3% of the respondents, Miswak is a tooth brush for them and according to 89.5% of the respondents natural vegetation is a major source of Miswak. 29.9% of the respondents have underscored natural vegetation as a major source of honey. 16.4% of the respondents have underscored natural vegetation as important source of wild fruits and vegetables.
- According to 22.3% of the respondents, natural vegetation is a major source medicinal plant.

- At a question of preferences for medicinal plants in Margalla Hills National Park, 13% people preferred Amaltas (Cassia fistula), 11% said Arind (Ricinus communis), 20% Bohr or Banyan tree (Ficus bengalensis), 20% Bhaikar (Justicia adhatoda), 17% Brahmni booti (Centella asiatica), 22% Daruna (Punica granatum), 19% Dhodhal (Euphorbia heliscopia) and 21% for Granda (carissa opaca).
- Only 19.8% of the respondents are using traditional implements for cultivation.
- Total 29.4% of the respondents were of the view that tourist flux is more during summer season.
- Total 98.9% of the respondents holds the view that there are no tourist guides.

5.3 CONCLUSION

- The study concluded that a bulk of the respondents own land. A large number of respondents rearing livestock (both milk and draft animals) and obtaining forage from natural vegetation. People used timber in house construction and hedges for protection. A reasonable number of respondents used non timber forest products. The income of the population of the area is not very high. There are no employment opportunities in the area under study. The respondents' also use natural vegetation in farm implements and domestic products to decrease their expenditure. Therefore people of study area highly depend (directly and indirectly) on natural vegetation by using in their daily life. In case of business related with local forests, the results are not so appreciating. However, the expenditure of this area is decreasing because people depend heavily on natural

vegetation for their subsistence and therefore most of their needs are fulfilled by natural vegetation, preventing them to spend money on these items.

- There is a shortage of ecotourism opportunities in Margalla hills because the recreational and environmental values are not being explored properly. In addition, there is a huge dependency of local communities on natural vegetation. This is causing tremendous pressure on natural vegetation. Therefore the continuous pressure without proper management can put the natural vegetation of this area in complete danger.

5.4 RECOMMENDATIONS

- There is a huge pressure on natural vegetation, however local communities holds the view that if alternate sources of energy is provided against fuel wood, it will massively contribute towards conserving natural vegetation. As local community suggested that provision of natural gas as domestic energy to local area can also divert the burden on forest.
- It is recommended that governmental as well non-governmental organizations should work in collaboration for the prosperity of local area, by generating employment opportunities, establishing new businesses, promoting education, developing tourism and enhancing environmental knowledge can change the socio-economic profile of study area.
- It is also recommended that public and private sector should organize the environmental education and natural resource management programmes for both males and females of all age groups. That will preserve the local flora and fauna for sustainable management.

- The other best possible option would be increase in ecotourism activities in the area, which will help in diverting undue pressure away from natural vegetation.
- Margalla Hills National Park is a draft established by CDA in 1980. That darft has rules and regulations for Margalla Hills National Park. Due of lack of implementation from local communities as well government, the proper preservation of forests cannot be achieved; therefore it is recommended that proper practice of said management plan take into account.
- The government organizations which are responsible for management of these areas should hire respective local community's representatives from different regions of the subject area. This will help in creating ownership amongst the local communities for the ecological significance of the park.

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INFLUENCE OF NATURAL FLORA IN LIVELIHOOD STRATIGIES OF RURAL COMMUNITIES

INTERVIEW SCHEDULE

Date: _____
Code: _____
District: i. Islamabad ii. Haripur
Union Council: _____
Village: _____

SOCIO-ECONOMIC BACKGROUND

1. What is your age?(In completed years) _____ Years

2. What is your marital status? i. Married ii. Divorced iii. Widower iv. Separated v. other (Justify)

3. What is your qualification?

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	16+

4. Can you tell me what maximum education is in your household?

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	16+

5. What is your family type you live in? i. Nuclear ii. Joint iii. Extended

6. How many family members you have? i. 1-5 ii. 6-10 iii. 10+

7. What is your occupation. Agriculture ii. Government Job iii. Private Job iv. Business v. Self-Employment vi. Skilled Labor (Please Justify _____) vii. Unskilled Labor viii. Any Other ___

8. What is major occupation of your family? i. Agriculture ii. Government Job iii. Privete Job iv. Business v. Self-Employment vi. Skilled Labour (Please Justify __) vii. Unskilled Labour viii. Any Other ____

9. What is your income? (Rupees/Month) _____ Rupees

10. What is your family income from all sources? (Rupees/Month) _____ Rupees

11. What is approximate expenditure of your family? (Rupees/Month) _____ Rupees

12. Do your family own the land? i. Yes ii. No (If No go to Q21)

13. How much land do your family own? (Kanals) i. Less than 8 ii. 9-16 iii. 17-24 iv. 25-32 v. 33-40 vi. 41-48 vii. 49-56 viii. 56_+

14. What is status of your cultivated family land? i. Less than 8 ii. 9-16 iii. 17-24 iv. 25-32 v. 33-40 vi. 41-48 vii. 49-56 viii. 56_+

15. What is status of your barren family land? i. Less than 8 ii. 9-16 iii. 17-24 iv. 25-32 v. 33-40 vi. 41-48 vii. 49-56 viii. 56+

16. Do you cultivate crops in your fields? i. Yes ii. No

17. What kind of crops do you cultivate? i. Wheat ii. Maize iii. Mustard iv. Any other (Please justify)

18. Do you cultivate vegetables in your fields? i. Yes ii. No

19. What kind of crops do you cultivate? i. Onion ii. Potatoes iii. Radish iv. Carrot v. Peas vi. Turnip vii. Cucumber viii. Any other (Please justify) _____

20. Does your income increase through cultivating crops? i. Yes ii. No

EXAMINING THE SUBSTANCE OF LOCAL COMMUNITY DEPENDING ON NATURAL FLORA

22. Do you have your own livestock? (If No go to Q25) i. Yes ii. No

23. Which of the following livestock you possess? i. Buffaloes ii. Cow iii. Goat iv. Sheep v. Camel vi. Donkey vii. Any other (Please justify) _____

24. What is source of fodder and forage for your livestock? i. Natural Vegetation ii. Cultivation iii. Natural Vegetation & Cultivation iv. Purchase v. Any other (Please justify) _____

25. Do you raise Poultry? i. Yes ii. No

26. Which type of fuel is used in your home? (If fuel wood go to Q27) i. Fuel wood ii. Dung iii. Coal iv. Kerosene oil v. LPG vii. Electricity Heater viii. Any other (Please justify) _____

27. What is the source of fuel wood? Natural Vegetation iv. Purchas iii. Both iv. Any other_____

28. What is the status of your house, you are living in? i. Paved ii. Sami-Paved iii. Un-Paved

29. Do you have livestock shed? i. Yes ii. No

30. What is the status of your livestock shed? i. Paved ii. Sami-Paved iii. Un-Paved

31. Did you use timber in your house? (If yes go to Q33) i. Yes ii. No

32. Did you use timber in your livestock shed? (If yes go to Q33) i. Yes ii. No

33. What is source of timber? Natural Vegetation ii. Purchase iii. Both iv. Any other (Please justify)

34. Did you use timber during last 12 months? i. Yes ii. No

35. Do you use hedges (Fences)? (If No go to Q38) i. Yes ii. No

36. What is the purpose to use hedges? i. Household protection ii. Crop protection iii. Animals corals protection iv. Boundary demarcation v. Any other (Please justify) _____

37. What is the type of hedges you used? i. Natural Vegetation ii. Protection wires iii. Both iv. Any other (Please justify) _____

NON TIMBER FOREST PRODUCTS (Q39 TO Q48)

38. Do you use Miswak? (If yes go to Q39) i. Yes ii. No

39. What is the source of Miswak? i. Natural Vegetation ii. Purchase iii. Both

40. Do you use Medicinal Plants? (If No go to Q45) i. Yes ii. No

41. What is the purpose to use Medicinal Plants? i. Own medication ii. Livestock medication iii. Both

42. What is the source of Medicinal Plants? i. Natural Vegetation ii. Purchas iii. Both

43. Are you satisfied with the results of Medicinal Plants? i. Yes ii. No

44. Major species which have excellent results in human beings?
i. _____ ii. _____ iii. _____ iv . _____ v. _____

45. Major species which have excellent results in human beings?
i. _____ ii. _____ iii. _____ iv . _____ v. _____

45. Do you use Wild Fruits/Vegetables? (If yes go to Q46) i. Yes ii. No

46. What is the source of Wild Fruits/Vegetables? i. Natural Vegetation ii. Purchas iii. Both

47. Do you use Honey? (If yes go to Q48) i. Yes ii. No

48. What is the source of Honey? i. Natural Vegetation ii. Purchas iii. Both

FARM IMPLEMENTS AND DOMESTICPRODUCTS

49. Which type of farm implements you use for cultivation? (If traditional go to Q50 & Q51)
i. Traditional ii. New Technology iii. Both

50. Please tell which one of the following farm implements you use for Agriculture and Livestock?

Scientific Name (*Vernacular Name*)

i. Wooden handles *(Kelay)*	*Yes*	No	vii. Wooden plough *Hull*	*Yes*	No	Other Justify	*Yes*	No
ii. Wooden pegs (Dastay)	i.	ii.	viii. Wooden plank *(Majh)*	i.	ii.	xiii.	i.	ii.
iii. Wooden rake (2 & 3 prongs)*(Trangal & Sanga)*	i.	ii.	ix.Wooden spade *Karai*	i.	ii.	xiv.	i.	ii.
iv Wooden rake *(Pohra)*	i.	ii.	x.Hand hoe for looping tree branches *(Dhanga)*	i.	ii.	xv.	i.	ii.
v. Wooden blade (leveler) *Karah*	i.	ii.	xi. Donkey cart *(Rahra)*	i.	ii.	xvi.	i.	ii.
vi. Yoke (*Punjali)*	i.	ii.	xii. Wooden coach box *(Jandri)*	i.	ii.	xvii.	i.	ii.

51.Which farm implements did you make during last 12 months?

i. _____ ii. _____ iii. _____ iv . _____ v. _____

52. Do you use different domestic products using Natural Vegetation? (If No go to Q55) i. Yes ii. No

53. Which types of following domestic products made by Natural Vegetation you use?

Scientific Name (*Vernacular Name*)

i. Wooden pen *(Kalam)*	*Yes*	No	vii. Wooden ladder *(Parsang)*	*Yes*	No	Other Justify	*Yes*	No
ii. Sticks *(Soti)*	i.	ii.	viii. Wooden mesher *(Gohtna)*	i.	ii.	xiii.	i.	ii.
iii.Charpoy *Charpai*	i.	ii.	ix. Wooden churner *(Madhani)*	i.	ii.	xiv.	i.	ii.
iv . Wooden weaven stool *(Piheri)*	i.	ii.	x. Wooden churner's stand *(Nihni)*	i.	ii.	xv.	i.	ii.
v.Basket *(Tokra)*	i.	ii.	xi. Wooden roof drain *(Prenala)*	i.	ii.	xvi.	i.	ii.
vi. Broom *(Jahroo)*	i.	ii.	xii. Table & Chair *Maize (kursi)*	i.	ii.	xvii.	i.	ii.

54. Which domestic products did you make using Natural Vegetation during last 12 months?

i. _____ ii. _____ iii. _____ iv . _____ v. _____

TOUARISM

55. Does the tourist visit to your area? (If No go to question Q59) i. Yes ii. No

56. Which is the peak tourist season? i. Winter ii. Spring iii. Summer iv. Autumn

57. What types of services/products you provide to tourist? i. Tourist Guide **ii.** Wild Fruits/Vegt. **iii.** Handicrafts **iv.** Honey **v.** Livestock **vi** Potter **vii.** Meals **viii.** Paying Guest **ix.** Dairy/Eggs **x.** Refreshments **xi.** Flowers/Buckeyes **xii.** Any other (Please justify)_____

58. How much income you derive from tourism? Annual Income: _____ Rupees

BUSINESS RELATED TO NATURAL FLORA

59. Do you have any business/trade related to the following?

Items	Yes	No
Fodder and Forage	i	ii
Fuel Wood	i	ii
Timber	i	ii
Hedges	i	ii
Medicinal plants	i	ii
Wild Fruits/Vegetables	i	ii
Dairy Products	i	ii
Poultry/Eggs	i	ii
Honey	i	ii
Farm Implements	i	ii
Domestic Products	i	ii
Miswak	i	ii
Wild Life	i	ii
Other (Please justify)	i	ii

JOBS RELATED TO NATURAL FLORA

61. Do you have any job related to following?

Items	Yes	No	Govt.	NGO	Income /Annual
Tourist Guide	•	•	•	•	
Forestry / Wildlife Dep.	•	•	•	•	
Hoteling	•	•	•	•	
Other (Justify)	•	•	•	•	

SUGGESTIONS OF LOCAL COMMUNITY AND RESERCHER

63. Suggestions for conservation of Natural Vegetation for sustainable Management in Margalla Hills?

64. Suggestions of Researcher?