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Causes of Deforestation and Its Effects on Different Factors in Rural Community of District Swat-Pakistan

Syed Fawad Ali[1] Naushad Khan[2]
1.Student of M.Sc(Hons) Rural Development, Faculty of Rural social Sciences, The University of Agriculture Peshawar
2.Advisor of the Student, Institute of Development Studies, Faculty of Rural Social Sciences, The University of Agriculture Peshawar

Abstract
Forest play key role in the development of a country. They provide wood, medicinal plants, grazing field to livestock and protection to the natural habitat while also generate job to rural community of district Swat. Seeing to its importance the present study was conducted in 2015 in rural area of District swat. The major objectives were to find out the causes of deforestation and its effects on different factors in rural community of the study area. On the basis of more surrounding forest three villages namely Charma , Sulathan and Gamsir were selected and through proportional allocate sampling techniques 53, 23 and 34 respondents were chosen respectively. Through interview schedule data were collected from the respondents and used descriptive statistics and chi-square test for analysis. Results indicate 47 % respondents were literate; 45% family size was estimated 6-10 members; 82% respondents were knowledge about excessive deforestation in the study area. Major causes of deforestation were found usage of wood for cooking and construction of houses. The result further revealed that all the community population is responsible for deforestation for not using available alternative resources to overcome timber mafia, overgrazing field, increased commercial usage and migrations towards to forest area for survival basses. Result further explained that there was high impact of deforestation on climate change in the form of irregular pattern of rainfall, snowfall, floods, soil erosion, decreasing of fodder quantity for animal and unfavorable environment for wildlife habitats in the study area. On the basis of causes majority respondents recommend campaigns, trainings programs, seminars and workshop for awareness, to care the forest in future. Generate employment opportunities in the study area for livelihood means for not cutting the forest trees by local community in the study area; to launch reforestation programs on seasonal basis ; Proper monitoring for check and balance of forest by forest department and appointment of honest staffs for further enhancement of forest growth is required.
Keywords: Causes, Deforestation, Effects on different factors, Rural Community , District Swat

1. INTRODUCTION

Forests and resources of the forest plays vital role in the growth and development of a country's economy as worldwide. In addition to the overall macroeconomic growth of nations, it also provides resources for basic livelihood needs. This is especially true for the poor and rural populations. More than 200 million inhabitants of the forest and livelihoods of poor immigrants are directrly dependent on the food, fiber, fodder, fuel and other resources taken from the forest or produces on recently cleared forest soils(Angelsen et al., 1999). Medical researchers in the tropical rainforests, continuous making new discoveries each year from Plants. These plants may contain the cure for cancer or some clues that could lead to a scientific discoveries(Winters, 200). However, more than 1.6 billion people around the world depend on forests for some part of their livelihood(USAID, 2007). Forest area and its changes are important and supposedly easily measurable, indicators for sustainable resources management in large areas to improve environmental and economic health (Kleinn, 2001: Morrow et al., 2001).

Although the value of tropical forest resources at national and international levels is increasingly recognized. Most of the forests will continue to be seriously threatened and disappearing amazingly at an alarming rate. In tropical regions, deforestation and forest degradation are progressive processes that are advancing at an alarming rate(Verolme et al., 1999; Rudel and Roper, 1997; Laurance, 1999), resulting in the conversion of wooded area into a mosaic of mature forest fragments, degraded habitat and pasture. Deforestation is one of the main environmental problems in third world countries(Araya et al.,2003) and rapid depletion of forest resources is causing various other social and economic problems in the world.

Every year, large areas of rainforest were cut down in the whole world. In addition, increased drought is expected to affect parts of the rainforest in the course of the next century(Malhi et al., 2008). Deforestation is primarily confined to developing countries, primarily in the tropics(Myers, 1994). In addition, tropical deforestation has become a problem of global environmental issues concern, in particular because of the value of tropical forests, in biodiversity conservation and limiting the greenhouse effect(Angelsen et al., 1999) Deforestation leads to destruction of biodiversity and the extinction of plants and animals. Its estimated that 4000 plants and animals become extinct each year due to deforestation, most of which have never been found. One thing is certain if deforestation continues out of controlled, numerous species will be disappear forever in the

deforestation process. Many biologists believed that loss of biodiversity is the most important impact of deforestation (Winters, 2000).

Gloklany (1995) found in his study that developing countries are more sensitive to deforestation due to growth and trade liberalization. Forest density is important indicators of ecological stability which play a significant role in conserving the natural world(Valente and Vettorazzi, 2008) while fragmentation enhances the isolation of forest patches and decrease in their size(Geneletti, 2004). Deforestation and forest degradation are the consequences of the interaction of the various environmental and socioeconomic forces at work in any given region. It is a dynamic process which can be regulated by complex biophysical and socioeconomics factors(Namaalwa et al., 2007). These factors play a significant role in forest fragmentation and can have large degrees of variation across the landscapes. Natural or anthropogenic impacts of disturbances are always complex in the dynamics of forest ecosystems(Kangur et al., 2005), they will affect forest structure, composition and ecological processes. People and their livelihood security are often susceptible particularly those who live in and around the degraded forest's frontiers. While deforestation happens environmental degradation severely degenerates (WCC, 2000; SOE. 2001) various natural phenomena as well as socioeconomic circumstances of a particular geography (USAI, 2007; FAO, 1998).Pakistan's economy relies on agriculture while increasing urbanization, utilization of land for agriculture, higher population rate an state forest policies are considered main factors causing deforestation in the country. Due to these factors Pakistan has a high rate of deforestation. Forest resources are vital for conservation of soil, water resources and biological diversity worldwide and play key role in meeting requirements for forest products both timber and non-timber (Siry, 2005).Pakistan , due to limited forest resources with deforestation rate of 4.6% per annum ranks on the second highest number in world and represents thrashing ecologicia services nationally(Khan&Khan,2009).

The forests in Pakistan Particularly Conifer forests reflect immense climatic and physiographic contrasts and are under constant pressure due to population growth, human activities and commercial harvesting for fuel wood made timber utilization (Anon.,2007a). A variation in the climatic condition that pertain for an unlimited time, generally decades or longer (Annonymous. 2007b; Shakoor et al., 2011). The relationships between forest change and its associated factors are often complex and nonlinear (Mas et al., 2004).The most recent impacts of climate changes were also witnessed during the droughts of 1900 to 2000 in Pakistan (Anon.,2007b). In the hilly area of Pakistan trees and forest resources almost always have a place in rural livelihood. Rural people depends on forests for livestock fodder, timber for houses and for fire wood which is the most important and often the only source of energy for cooking and heating (Khan &Naqvi,2000). But in Pakistan deforestation problem is at peak. A decrease of 39000 hectare of forest per year is cleared (FAO,2001). It rate sustain in Pakistan, it will lose most of its forest with in thirty to forty years and being considered as a forest poor country with occupying less than 5% of total land , so forest preservation is a really important task for Pakistan.

A tree can be harvested when reached to a certain age but forests are renewable source. Khyber Pakhthunkhwa is the rich area of forest in Pakistan based on climatic condition , the whole KP should be covered under tropical thorn forest in the plain, temperature forest as short elevation and wide leaved forest as foothills with low rainfall (Champion, 1996).The Khyber Pakhtunkhwa province of Pakistan is endowed with wealth of natural resources including forests. However due to multiple reasons (Ali et al., 2007; Shahbaz et al., 2007), as the natural forests of KP is shrinking at high rate (FAO,2007). Indeed depletion of natural forest in these area is one of the most threatening environmental issues in Pakistan. Nevertheless numerous forest development and extension projects had been carried out by international donor agencies and the government of Pakistan during the last three decades. But in spite of these entire efforts deforestation rate is still very high and the situation is worsening every year (FAO, 2005 and 2007). Many researchers have pointed out towards the ineffectiveness and un-sustainability of state forest policies is one of the major causes of forest depletion towards this and some authors have under lined the needs for the involvement of stakeholders in the deployment intervention. There exists a vast range of stakeholders who have stake in the use of forest resources in KP and have different rights and claims in the forests (Suleri et al., 2008).

The valley of Swat is a part of Malakand Division and typically consists of mountainous protected forest owned by the state. The government contractors can cut trees which are used as source of generate revenue 60 to 80% and out of this is paid as public royalty. The local people have the constitutional rights of grazing and collection of small products which is a source of earning and carries out agriculture on the plain of the valley (Iqbal, 2003).Historical developments are at the origin of the right holding of heirs of the most important families allied to the local director. Swat has a distinct history in relation to Pakistan and the rest of the Indian subcontinent. While the rest of the area was colonized by the British crown, swat succeeded in conserving its autonomy and once Pakistan became independent in 1947, it did not fully access Pakistan until 1969. In Swat there are lush green hills and mountains with snowcapped peaks in the distance. The impression is of paradise. On second side most of the lush green areas are not the virgin forests that once covered the hillsides is not so distant as past. There are only isolated spots of forest left. On the road there is a steady stream of trucks, pick-up trucks, donkeys and human beings transporting timber and fuel wood from the forest to the lower, more densely

populated areas. Corruption plays an important role in illegal logging operations that take place across Swat. The enforcement agencies whose official goal is protecting the forest have in many occasions turned to the main culprits. Seeing to its significance the study was carried out in district Swat to identify causes of deforestation and its effects on different factors in the rural community of District Swat.

2. METHODS AND MATERIAL

The present study was conducted in District Swat Khyber Pakhthunkhwa Pakistan. Upper Swat Vally was selected purposively because it is enriched in forests, and majority of its rural population directly depends on forest resources for different purposes of their livelihood.In upper Swat valley three villages namely Charma , Sulathan and Gamsir were purposively selected because majority of its population surrounding is forest and directly depends on forest resources for different purposes of livelihoods. Due to financial and time constraints only 5% of the total population was selected as sample size. The said Sample Size was allocated to various strata i.e Charma, Sulathan and Gamsir on proportional allocate basis according to formula given below:-Proportional sample size of each Strata=n/NxNi where n=required sample Size, N= Size of Population, Ni= Size of ith sub-population (Village) (Chudary and Kamal, 1996)

Table.1 Distribution of Sample Respondents in the Study Area

Name of Village	Population	Sample Size
Charma	1050	53
Sulathan	460	23
Gamsir	680	14
Total	2190	110

Based on the objectives of the study i.e causes and impacts of deforestation on rural communities the study area were interviewed. Among those people that have direct concern with forests for their livelihood i.e fuel wood consumption, income generation and for construction purpose etc was considered as a respondents and were personally interviewed to reach reliable conclusion. Keeping in view the study objectives a well structure and well prepared questionnaire was developed which cover the major aspects of the study. Five point Likert Scale was used for measuring the magnitude of causes and impacts of deforestation. The questionnaires were pretested on 20 local individuals who were not inclsuded in the sample for its validity and necessary modification were made after pre-testing. The collected data was coded and entered in SPSS software for analysis. Simple percentage and frequency was calculated. The results was shown in cross tabulations along with frequency and percentages because of the perspective nature of the variables. Chi-square test was used for finding association between the variables.

3. RESULTS AND DISCUSSIONS

Result and discussion section consist of four parts. Socio economic characteristics of the respondents, causes of deforestation, impact on the rural community and respondents role in deforestation. In first part age, family system, family size, Literacy status, educational level, source of income and knowledge about deforestation by community were included while in the second part population pressure, commercial usage, migration toward forest for survival, fuel wood, un-controllable animal grazing, timber mafia, mining, abrupt fires, natural hazard, construction of houses, poverty, conversion to agriculture land were merged. Similarly in the third part Effects on climate change, floods, income level of the respondents, fodder quantity of animals, soil erosion and wild habitat were included while in fourth part respondents role in deforestation were incorporated.

SOCIO-ECONOMICS CHARARACTERISTICS

Age of the Respondents

Age is an important factor which directly influences the awareness and adoptability of any innovations. Age shows the life expectancy of the respondents. Age is an essential variable in regards to measure a social entity. Todaro (1997) has the opinion that age, income level and literacy rate are the basic indicators of development. Therefore data was collected regarding this important attribute which was presented in Table 2. It was found in the table that majority 40.9% of the respondents were from the age category of 31-40 year followed by 28.2% of the respondents who were from the age category of 21-30 years, 24% of the respondents were from the age category of above 40 years and whereas only 7.3% of the respondents were from the age category of up to 20 years. From the present study it was revealed that greater part of the respondents were from middle age (31-40 years) and were having greater experience and exposure as compare to young ones. Therefore it was good sign to probe the respondents regarding the important aspects of deforestation.

Table 2 Distribution of Sampled Respondents Regarding their Age Status

Villages	Age of the Sampled Respondents								Total	
	Up to 20 years		21-30 years		31-40 years		Above 40			
	Frequency.	%	Frequency	%	Frequency.	%	Frequency	%	Frequency	%
Charma	5	4.5	18	16.4	18	16.4	12	10.9	53	48.2
Sulathan	3	2.7	4	3.6	10	9.1	6	5.5	23	20.9
Gamsir	0	0.00	9	8.2	17	15.5	8	7.3	34	30.9
Total	8	7.3	31	28.2	45	40.9	26	23.6	110	100.0

Source: Field Survey 2015

Literacy Status of Sampled Respondents

The term literacy is defined by Canada Human Resource Developmental (CHRD) and by Organization for Economic Cooperation and Development (OECD), is a mode of adult behavior using printed and written information to function in a society to achieve once goal and to develop once knowledge and potential (Anonymous, 1995)**.** In Pakistan the overall literacy rate is 58% (GoP, 2012-13) which is very low as compared with other developing countries. The Table 3 indicates village wise literacy status of sampled respondents in the study area. According to which 64.5% of the respondents were belonging to literate group while 35.5% of respondents were belonging to illiterate group. Table further shows that out of total literate respondents 43.7 % have metric, 26.8% intermediate, 22.5% Middle while above intermediate and Primary have 5.6% and 1.4% level of education respectively. In rural areas mostly literacy status is low but from the present study it was concluded that literacy status in study area is increasing which is important for the development of study area. Before any developmental process in any local community it is necessary that planners must focus on education of that community because education creates awareness for new innovations and educated men or women can easily understand as compared with illiterate ones. Any strategy that is design to increase productivity in the rural sector, must include investment in human capital mainly in primary and secondary education level (Zuberi 1989).

Table 3 Distribution of Sampled Respondents Regarding Literacy Status

Villages	Literacy Status of Respondents				Total	
	Illiterate		Literate			
	Frequency	%	Frequency	%	Frequency	%
Charma	21	19.1	32	29.1	53	48.2
Sulathan	10	9.1	13	11.8	23	20.9
Gamsir	8	7.3	26	23.6	34	30.9
Total	39	35.5	71	64.5	110	100.0

Village	Education Level of Respondents										Total	
	Primary		Middle		Matric		Intermediate		Above Intermediate			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Charma	0	0.00	8	11.3	15	21.1	9	12.7	0	0.0	32	45.1
Sulathan	0	0.00	3	4.2	6	8.5	2	2.8	2	2.8	13	18.3
Gamsir	1	1.4	5	7.0	10	14.1	8	11.3	2	2.8	26	36.6
Total	1	1.4	16	22.5	31	43.7	19	26.8	4	5.6	71	100.0

Source: Field Survey 2015

House Hold Size Distribution

A household size is usually defined as "A group of peoples eating and living together depends on each other directly or indirectly" (Sohail 2012). The respondents were investigated about their house hold sizes in the table 4. The table indicates that 44.5% of the respondents have family size of 6-10 members, the table further shows that 36.4% of the respondents have family size of above 10 members while only 19.1% respondents have household size of up to 5 members. It was observed from the Table that almost large household size is observed in the study area, large household size due to joint family system where people prefer living together with more than one generation. Ali *et al.* (2006) studied that in North West Pakistan a large family size with an average of 9 members per house is observed which is very high as compared to both national and other provinces averages.

Table 4 Distribution of Sampled Respondents Regarding their House Hold Size

Village	House Hold Size						Total	
	Up to 5 Members		6-10 Members		Above 10 Members			
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Charma	10	9.1	27	24.5	16	14.5	53	48.2
Sulathan	6	5.5	8	7.3	9	8.2	23	20.9
Gamsir	5	4.5	14	12.7	15	13.6	34	30.9
Total	21	19.1	49	44.5	40	36.4	110	100.0

Source: Field Survey 2015

Family System

Table 5 shows the family system of respondents therefore family system is divided into two types in the table; nuclear family system and joint family system. The Table indicates that majority 64.5% of the sampled respondents belong to Joint family system while 35.5% belongs to nuclear family system. It was concluded from the table that the joint family system in the study area was higher than nuclear family system. It may due to poverty, lack of awareness and cultural aspects etc. However a meaningful existence for nuclear family is indicative of the fact that it is as well. As cultural prerogatives, joint family is still preferred over, especially in rural areas of Pakistan.

Table 5 Distribution of Sampled Respondents Regarding Family System

Villages	Family System				Total	
	Nuclear		Joint			
	Frequency	%	Frequency	%	Frequency	%
Charma	22	20.0	31	28.2	53	48.2
Sulathan	5	4.5	18	16.4	23	20.9
Gamsir	12	10.9	22	20.0	34	30.9
Total	39	35.5	71	64.5	110	100.0

Source: Field Survey 2015

Source of Income in Research Area

Occupation is the basic source for comfortable and smooth social life. Level of occupation is also important because high level of income often assures good standard of life, the respondents were investigated about the source of income in the Table 6 the income sources are divided into five main categories agriculture, government services, private services, business and livestock. Table 6 disclosed that majority 38.2% of respondents were agriculture employed, followed by 32.13% of private services which includes business men, shop keepers, drivers, school teachers, cobblers, tailors and foreign remittances as well, about 18.2% of respondents belongs to business sector. The table further indicates that 10.9% of respondents belong to government services and only 0.9% belongs to livestock. It is concluded from the table that in rural areas mostly peoples are engaged in agriculture for their survival. Agriculture is their basic source of income because of having large agriculture lands in rural areas, they not only earn money from their agriculture lands but also feed their families by growing different vegetables and crops in their fields, the table also shows that most of the respondents were from different fields of life's to get their income for the purpose to fulfill their own and their family immediate needs.

Table 6. Distribution of Sampled Respondents Regarding their Source Of Income

Villages	Source of Income										Total	
	Agriculture		Government Services		Private Services		Business		Livestock			
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Charma	18	16.4	5	4.5	19	17.3	10	9.1	1	0.9	53	48.2
Sulathan	8	7.3	4	3.6	6	5.5	5	4.5	0	0.00	23	20.9
Gamsir	16	14.5	3	2.7	10	9.1	5	4.5	0	0.00	34	30.9
Total	42	38.2	12	10.9	35	31.8	20	18.2	1	0.9	110	100.0

Source: Field Survey 2015

Knowledge About Deforestation in Research Area

Dramatic depletion of forests in Pakistan for fuel wood consumption and commercial purposes is affecting rural community. Rural poor directly depends on these natural resources but un-sustainable utilization of forests had affected the whole environment of the study area, Deforestation is one of the main environmental problems in third world countries (Araya *et al*., 2003) and rapid depletion of forest resources is causing various other social and economic problems in the world. The Table 7 shows village wise distribution of respondents regarding their knowledge about deforestation; the table further shows that majority of respondents 81.8% have knowledge about deforestation while only 18.2% of respondents have no knowledge about deforestation. Further table

shows that 33.3% respondents have the view that deforestation is cutting of trees, 30.0% respondents considered deforestation is illegal felling about 24.4% considered deforestation is transformation of forest into other use while 12.2% respondents suggests that deforestation is permanent loss of forest cover. Ali *et al*. (2006) analyzed the Myths and realities of deforestation in North West Pakistan. The study reported a very high deforestation rate in Pakistan. From the Table it was concluded that majority of respondents have knowledge about deforestation which indicates that there is excessive deforestation in the research area, it is necessarily required to create awareness about deforestation in the study area who don't have knowledge about deforestation. .

CAUSES OF DEFORESTATION

Deforestation in Pakistan is resulting due to multiple causes in which the key causes were in population density, commercial usage, migration towards forest areas, fuel wood, uncontrollable animal grazing, unemployment, timber mafia, abrupt fires, natural hazards, construction of houses, poverty and conversion of forest land to agricultural land etc which are discussed in table 8 . According to table 43.3% of the respondents mark the increasing population as high risk for deforestation on Likert Scale, while 39% consider very high, 16.7% reported medium whereas only 1.1% of the respondents reported low on Likert scale the increasing population as the cause of increasing deforestation. Table further shows that 44.4% of the respondents mark the increased commercial usage as high risk for deforestation. About 24.4% of the respondents mark very high scale while 23.3% of the respondents reported medium and 7.8% of the respondents mark low on Likert Scale the increased commercial usage as cause of deforestation. Table also shows that 63.3% of total respondents considered migration towards forest area for survival high risk for deforestation while 36.7% reported it a medium for deforestation on Likert Scale. The Table 4.12 further enclosed that 58.9% of the respondents reported fuel wood usage very high risk for deforestation, Shaheen *et al* (2011) also reported that majority of local community in Himalayas are helpless to use forest resources and depend only on this resource for fuel and other energy needs. Human and livestock needs together exploit this natural and precious natural resource. It was further indicates that about 24.4% of the respondents reported high while 8.9% of the respondents considered low risk and only 7.8% of the respondents considered fuel wood as medium risk for deforestation on Likert Scale. The respondents were further investigated about over grazing of animals as a cause of deforestation in research area, the Table indicates that 41.1% of total respondents reported uncontrollable animal grazing high risk for deforestation on Likert Scale. Fensham *et al.* (2011) also concluded in his study that over grazing of animals on a specific area decrease the specie richness in that environment. The local flora in any region can be protected by preventing over grazing. Table further indicates that about 40% considered over grazing very high risk while 17.8% respondents mark medium and only 1.1% respondents reported low risk on Likert Scale as the cause of deforestation. The respondents are further investigated about unemployment in the study area as the cause of deforestation, the Table shows that 42.2% of the respondents reported unemployment very high risk for deforestation, about 32.2% of the respondents considered high, 22.2% of the respondents reported medium while 2.2% of the respondents reported very low and only 1.1% reported low in Likert Scale as the cause of deforestation. Table further indicates that 81.1% of the respondents mark timber mafia as high risk for deforestation, about 30% of respondents considered very high, 18.9% of the respondents suggests medium while 13.3% of respondents reported low and only 4.4% respondents mark very low on Likert Scale as the cause of deforestation. The Table further disclosed that 60.0% of total respondents mark mining as low risk for deforestation, about 22.2% of the respondents mark very low while only 17.8% mark medium scale on Likert as the cause of deforestation. The Table further showed that !00% of respondents considered abrupt fires as very low cause of deforestation on Likert Scale. The Table also indicates that 45.5% of the respondents mark natural hazards as low risk for deforestation on Likert scale; about 35% of the respondents mark very low while only 18.9% of the respondents mark medium which shows that natural hazards have low effects on deforestation in research area. The Table further enclosed that 43.3% of the respondents mark construction of houses as a high risk for deforestation; about 48.9% respondents mark very high while only 7.8% of the respondents mark medium on Likert Scale. The respondents were further investigated about poverty as the cause of deforestation. About 32.2% of the respondents mark very high risk for deforestation, almost 26.7% of the respondents mark high scale, about 24.4% of the respondents mark medium scale while about 15.6% of respondents mark low scale and only 1.1% respondent mark very low on Likert Scale about Poverty as the cause of deforestation. The respondents were further investigated about conversion of forest land into agricultural land as the cause of deforestation, the Table shows that about 32.2% of the respondents mark medium scale, about 24.4% of the respondents mark high scale, almost 23.3% of the respondents mark low scale while 15.5% of the respondents mark very high scale and only 4.6% of the respondents mark very low on Likert Scale. It was concluded from the table that the sampled respondents considered fuel wood, construction of houses, poverty and unemployment as a high risk for deforestation which indicates that these are the major causes of deforestation in the study area. Rural peoples depends directly on forests for livestock fodder, timber for houses and fire wood which is the most important source of energy for cooking and heating (Khan & Naqvi, 2000). The respondents further suggests increased in population, increased commercial usage, migration towards forest areas for survival, over grazing,

and timber mafia were also the major concerns causing deforestation in the study area.

Table 8 Causes of Deforestation Claimed by Sampled Respondent in the Study Area

Causes	Scale				
	Very Low	Low	Medium	High	Very High
Population Pressure	-	1 (1.1)	15 (16.7)	39(43.3)	35(38.9)
Increased Commercial Usage	-	7(7.8)	21(23.3)	40(44.4)	22(24.4)
Migration Towards Forests Area for Survival	-	-	33(36.7)	57(63.3)	
Fuel Wood	-	8 (8.9)	7(7.8)	22(24.4)	53 (58.9)
Uncontrollable Animal Grazing	-	1(1.1)	16(17.8)	37(41.1)	36(40)
Unemployment in the Area	2 (2.2)	1(1.1)	20(22.2)	29(32.2)	38(42.2)
Timber Mafia	4 (4.4)	12(13.3)	17(18.9)	30(81.1)	27(30)
Mining	20(22.2)	54(60)	16(17.8)	-	-
Abrupt Fires	90 (100)	-	-	-	-
Natural Hazards	32(35.6)	41(45.5)	17 (18.9)	-	-
Construction of Houses	-	-	7(7.8)	39(43.3)	44(48.9)
Poverty	1 (1.1)	14(15.6)	22(24.4)	24(26.7)	29(32.2)
Conversion to Agricultural Land	4(4.6)	21(23.3)	29(32.2)	22(24.4)	14(15.5)

Source: Field Survey 2015

DIFFERENT EFFECTS OF DEFORESTATION

There are so many social, economic and environmental effects of deforestation on local community, but the major effects were selected and investigated from the sampled respondents which were effect of deforestation on climate change, floods, income of villagers, fodder quantity, soil erosion and wild life habitat. The perception of sampled respondents regarding different effects of deforestation are discussed as follows;

Effect of Deforestation on Climate Change in Research Area

Forest density is important indicators of ecological stability which play a significant role in conserving the natural world (valente and vettorazzi, 2008). The sampled respondents were investigated about effects of deforestation on climate change in their area. According to the Table 9 about 56.4% of the respondents were reported very high effect of deforestation on climate change, about 30% of the respondents were considered high effect of deforestation on climate change, 5.5% respondents mark low and 2.7% of the respondents were considered medium effect while, only 1.8% of the respondents were marked very low effect of deforestation on climate change on Likert Scale. It was concluded from the table that majority of respondents considered high effect of deforestation on climate change in their respective villages. Irregular rainfall, change in summer and winter seasons schedule and change in rate of snowfall were the major changes witnessed by local community in their environment due to deforestation in the last few years. The most recent impacts of climate change were witnessed during the droughts of 1900 to 2000 in Pakistan (Anon., 2007).The chi square test was applied to analyze the association between deforestation and its effects on climate change. The results shows that there is strong association (P= 0.00) of deforestation and its effects on climate change.

Table 9. Perception of Sampled Respondents Regarding Effect of Deforestation on Climate Change

Village	Effect of Deforestation on Climate Change										Total	
	Very Low		Low		Medium		High		Very High			
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Charma	2	1.8	6	5.5	3	2,7	12	10.9	30	27.3	53	48.2
Sulathan	1	0.9	1	0.9	0	0.0	7	6.4	14	12.7	23	20.9
Gamsir	1	0.9	1	0.9	0	0.0	14	12.7	18	16.4	34	30.9
Total	4	3.6	8	7.3	3	2.7	33	30.0	62	56.4	110	100.0

Source: Field Survey 2015

Chi-square Value= 49.355

P-value = 0.00

Effect of Deforestation on Floods in Research Area

Due to increase in deforestation large floods can be expected because deforestation increases the chances of small or large floods in any community. In this regard the sampled respondents were investigated regarding effects of deforestation on floods in research area. The Table 10 indicates that about 38.2% of the respondents were reported high effect of deforestation on floods in study area, the table further indicates that about 30.9% of the respondents were considered medium effect, about 20.9% of the respondents were reported very high effect

while about 6.4% respondents mark very low effect and only 3.6% of the respondents mark low effect of deforestation on floods in research area on Likert Scale. It was concluded from the table that majority of respondents considered medium effect of deforestation on floods in their respective villages but if deforestation still continues in the study area large floods can be expected so it is necessary to control deforestation for the safe future of local community. Every year, large areas of rainforest were cut down in the whole world. In addition, increased drought is expected to affect parts of the rainforest in the next century (Malhi *et al*., 2008). The chi square test was applied to analyze the association between deforestation and its effects on floods. The results shows that there is strong association (P= 0.001) of deforestation and its effects on floods in research area.

Table 10. Perception of Sampled Respondents Regarding Effect of Deforestation on Floods in Research Area

Village	Effect of Deforestation on Floods										Total	
	Very low		Low		Medium		High		Very high			
	Freq	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Charma	6	5.5	3	2.7	14	12.7	15	13.6	15	2.7	53	48.2
Sulathan	0	0.0	0	0.0	10	9.1	11	10.0	2	0.0	23	20.9
Gamsir	1	0.9	1	0.9	10	9.1	16	14.5	6	0.9	34	30.9
Total	7	6.4	4	3.6	34	30.9	42	38.2	23	3.6	110	100.0

Source: Field Survey 2015
Chi-square Value=18.116
P-value = 0.001

Effect of Deforestation on Income of Villagers in Research Area

To find out the effect of deforestation on income of villagers in study area the sampled respondents were investigated in the Table 11. According to the table almost 40% of the respondents reported high effect of deforestation on income of local community. Shinta (2009) also reported high effects of deforestation on income level, the Table further indicates that about 27.3% of the respondents considered medium, about 23.6% suggests low effect and only 6.4% of the respondents considered very low effect of deforestation on income of villagers while only 2.7% respondents referred very high effect of deforestation on income of villagers on Likert Scale.The chi square test is applied to check the association of deforestation and its effects on income of villagers. The results shows that there is strong association (P=0.005) of deforestation and its effects on income of local community.

Table 11. Perception of Sampled Respondents Regarding Effect of Deforestation on Income of Villagers

Village	Effect of Deforestation on Income										Total	
	Very low		Low		Medium		High		Very high			
	Freq.	%	Freq.	%	Freq	%	Freq.	%	Freq.	%	Freq.	%
Charma	6	5.5	15	13.6	14	12.7	15	13.6	3	2.7	53	48.2
Sulathan	0	0.0	2	1.8	10	9.1	11	10.0	0	0.0	23	20.9
Gamsir	1	0.9	9	8.2	6	5.5	18	16.4	0	0.0	34	30.9
Total	7	6.4	26	23.6	30	27.3	44	40.0	3	2.7	110	100.0

Source: Field Survey 2015
Chi-square Value=14.918
P-value = 0.005

Effect of Deforestation on Fodder Quantity in Research Area

The sampled respondents were investigated about the effects of deforestation on fodder quantity in the Table 12 the table shows that about 40.0% of the respondents reported medium effects of deforestation on fodder quantity, about 27.3% of the respondents reported high effect, 23.6% of the respondents considered low effect; about 6.4% respondents reported very low effect while only 2.7% of the respondents mark very high effect on Likert Scale. The chi square test is applied to analyze the association of deforestation and its effects on fodder quantity in research area. The results shows that there is (P= 0.008) of deforestation and its effects on fodder quantity in research area.

Table 12. Perception of Sampled Respondents Regarding Effect of Deforestation on Fodder Quantity in Research Area

Village	Effect of Deforestation on Fodder Quantity										Total	
	Very low		Low		Medium		High		Very high			
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Charma	6	5.5	15	13.6	15	13.6	14	12.7	3	2.7	53	48.2
Sulathan	0	0.0	2	1.8	11	10.0	10	9.1	0	0.0	23	20.9
Gamsir	1	0.9	9	8.2	18	16.4	6	5.5	0	0.0	34	30.9
Total	7	6.4	26	23.6	44	40.0	30	27.3	3	2.7	110	100.0

Source: Field Survey 2015
Chi-square Value=13.744
P-value = 0.008

Effect of Deforestation on Soil Erosion in Research Area

The respondents were further investigated about effects of deforestation on soil erosion in study area, according to the Table 13, about 38.2% reported high effect of deforestation on soil erosion, The table further indicates that about 28.2% of the respondents considered very high effect, about 19.1% of the respondents reported medium effect while 10.0% respondents referred low effect and only 4.5% of the respondents mark very low effect of deforestation on soil erosion on Likert Scale. It is concluded from the Table 13 that majority of respondents considered high effects of deforestation on soil erosion in study area. It was concluded that deforestation had high effect on soil erosion in the study area. Rajbhanari (2000) also reported an increase of floods rate due to deforestation which results in soil erosion and debris flow. The chi square test is applied to analyze the association between deforestation and its effects on soil erosion. The results shows that there is strong association (P=0.00) of deforestation and its effects on soil erosion in research area.

Table 13 Perception of Sampled Respondents Regarding Effect of Deforestation on Soil Erosion in Research Area

Village	Effect of Deforestation on Soil Erosion										Total	
	Very low		Low		Medium		High		Very high			
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Charma	3	2.7	5	4.5	11	10.0	23	20.9	11	10.0	53	48.2
Sulathan	1	0.9	2	1.8	7	6.4	9	8.2	4	3.6	23	20.9
Gamsir	1	0.9	4	3.6	13	11.8	10	9.1	6	5.5	34	30.9
Total	5	4.5	11	10.0	31	19.1	42	38.2	21	28.2	110	100.0

Source: Field Survey 2015
Chi-square Value=53.188
P-value = 0.00

Deforestation on Wild Life Habitat in Research Area

The sampled respondents were further investigated about effects of deforestation on wild life habitat in study area, the Table 14 indicates that majority 39.1% of the respondents reported high effect of deforestation on wild life habitat, The table further indicates that about 25.4% of the respondents considered very high effects, about 21.8% of the respondents considered medium effects of deforestation on wild life habitat while 7.3% respondents reported low effect and only 6.4% of the respondents mark very low effect on Likert Scale. The results clearly shows that wild life habitat in study area is disturbed by human activities, Ahmad *et al* (1999) also reported that some of the important factors in which humans are involved like deforestation etc leads to the degradation of biodiversity. From the table it was concluded that majority of respondents reported high effect of deforestation on wild life habitat, Karkee (2007) also showed in his study that wild animals and trees are becoming rare because of deforestation. It is our responsibility to control deforestation rate to protect this valuable and precious wild animals in research area. The chi square test is applied to analyze the association of deforestation and its effects on wild life habitat. The results shows that there is strong association (P=0.000) of deforestation and its effects on wild life habitat in research area.

Table 14. Perception of Sampled Respondents Regarding Effect of Deforestation on Wild Life Habitat in Research Area

Village	Effect of Deforestation on Wild life Habitat										Total	
	Very low		Low		Medium		High		Very high			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Charma	3	2.7	3	2.7	21	19.1	17	15.5	9	8.2	53	48.2
Sulathan	2	1.8	1	0.9	1	0.9	9	8.2	10	9.1	23	20.9
Gamsir	2	1.8	4	3.6	2	1.8	17	15.5	9	8.2	34	30.9
Total	7	6.4	8	7.3	24	21.8	43	39.1	28	25.4	110	100.0

Source: Field Survey 2015
Chi-square Value=79.175
P-value = 0.000

Respondents Role in Deforestation in Research Area

Table 15 shows that 100% of the respondents considered themselves responsible for deforestation. The local community directly depends on forests for fuel wood, construction purposes and for livestock fodder etc but proper awareness is needed to be created in local villagers to utilize the available forest resource in such a sustainable manner so that there coming generation can also benefited from such a precious natural resource. The table further shows that 37.3% sampled respondents considered unemployment and poverty as main reason for their responsibility in deforestation, 35.5% reported no usage of alternative sources of fuel while 27.3% of the respondents believed that they have no proper future strategy how to sustain the natural resource

Table 15 Distribution of Sampled Respondents Regarding their Role in Deforestation

Village	Local Community Responsible for Deforestation		Total	
	Yes			
	No.	%	No.	%
Charma	53	48.2	53	48.2
Sulathan	23	20.9	23	20.9
Gamsir	34	30.9	34	30.9
Total	110	100.0	110	100.0

Village	If Yes Then Specify						Total	
	No Proper Future Strategy		Not Using Alternative Sources		Unemployment or Poverty			
	No.	%	No.	%	No.	%	No.	%
Charma	19	17.3	16	14.5	18	16.4	53	48.2
Sulathan	5	4.5	9	8.2	9	8.2	23	20.9
Gamsir	6	5.5	14	12.7	14	12.7	34	30.9
Total	30	27.3	39	35.5	41	37.3	110	100.0

Source: Field Survey 2015

4. CONCLUSION AND RECOMMENDATIONS

From the study it was concluded that greater portion of the study area inhabitants were aware of deforestation. Majority population, directly depend on forest for fulfilling their fuel and commercial usage. Due to their dependency on forest it is the major cause of deforestation in the study area. Majority people did not use the alternative sources of fuel like charcoal, gas and kerosene oil due to poverty which also indicated that poverty and unemployment also play their catalytic role in the deforestation. Similarly other major causes of deforestation were found population pressure, timber mafia, overgrazing, increased commercial usage and migration towards forest area for survival. Deforestation impacts were found on climate in the form of floods and irregular pattern of rainfall and snow fall which further affect the cropping pattern as well sowing and harvesting period in the study area. Subsequently other impacts were found on soil erosion, income of the respondents and on wildlife habitats. Furthermore the stance of local people about role and performance of forest department was found ineffective and inefficient in order to control excessive deforestation. Above all, respondents also consider local community responsible for deforestation apart from the inefficient role of forest department. Based on the conclusion of the study the following recommendations were suggested in order to minimize deforestation rate in the study area.

- Government and non government organization should arrange campaigns, training programs, seminars and workshops to create awareness about the effects of deforestation in the local community and its rehabilitation.
- Government should create jobs opportunities in the study area to uplift the rural life of the inhabitants and

make them able to use alternative sources of fuel.
- An annual plan of reforestation on seasonal basis in the study area is requested to reduce the high rate of deforestation.
- Separate monitoring team unit for check and balance of the forest department should be established in order to make their work efficient.
- Government should also launch developmental programs to protect the locality aftershocks of deforestation in the form of floods, soil erosion etc.
- Similar studies should also be carried out at regular intervals to measure the causes and effects because time span could trigger the effects for future control measuring.

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