

the world. It is because of the influence of forest cover on the regional hydrological cycle, Asian monsoon pattern and circulation pattern that affect not only the region but has global impact [23-26].

Some of these adverse impacts would result in variation

Rainfall: There would be an expected decrease in the annual precipitation rate in the region as a result of deforestation. There would be prolonged dry spells followed but short periods of intense rains [27].

Temperature: Forest cover regulates the air and surface temperature by absorbing carbon dioxide, with a decrease in the forest cover there would a significant increase in the temperature of the region.

An increase of about 10°C is predicted for the region due to deforestation and reduced rate of evaporative cooling [28].

The study on the effects of deforestation on the summer monsoon system in Asia and concluded that deforestation results in weakening of the monsoon system in the upland areas due to high wind speeds and low water vapor content but increased intensity and intense rainfalls in areas downwind of deforestation [29].

Mangrove deforestation: Mangrove forests provide a barrier against tides and waves. With the increasing trend of deforestation along the coastal belts of the region creates an imbalance in the natural water chemistry and expose the coastal community to the direct impacts of tides and waves [30].

Teleconnections: These include the effects associated with deforestation or the secondary effects of deforestation. Rapid decrease of forest cover in the area will not only alter the Asian climate pattern but will influence the global meteorological circulation patterns as well leading to intense climatic disasters.

Deforestation and climate change in Pakistan

Pakistan has most of its forests located in its northern parts in the highlands of Khyber Pakhtukhwa, Gilgit-Baltistan and Azad Kashmir.

About 39 thousand hectares of forests are vanishing annually at an annual depletion rate of more than 1.5%. The increasing trend of deforestation has negative impacts on the production and protection of the forests and livelihoods of those living around the forests.

Due to illegal exploitation and poor implementation of legislation the forest cover is depleting at a devastation rate in the country. As a consequence of deforestation there is increasing risk of landslides, slope destabilization, floods, increase surface runoff and soil erosion. After the Kashmir earthquake an increased risk of landslides and debris flow was encountered due to exploitation of forests [31].

In 2010 Pakistan experienced the worst flood of its history. Scientists termed the unprecedented rate of monsoon rains as impacts of climate change in the region. During the catastrophic event deforestation again aggravated the situation.

Natural and anthropogenic conditions played a combined role in creating a disastrous situation. Soil degradation and deforestation resulted in increased surface runoff and soil erosion.

Discussion

Causes of deforestation

Fuel wood and timber: In Mansehra 90% of the respondents were using the forest wood for cooking. However 56% of the respondents were using forests for timber in the same villages. In Swat district, 96% of the respondents were using fuel wood for cooking purposes and 84% of the respondents used forests for their timber needs. Fuel wood is an important component of house hold economies. In Pakistan fuel wood covers about 53% of total annual domestic energy. This dependence on fuel wood is expected to remain high in Pakistan in the future, because the economy of our country is not so strong that shift the traditional fuel wood to modern fuels. It is estimated that the population growth and fuel wood consumption will increase by 3% per year. The high demand for domestic fuel wood is believed to be rapidly depleting the forests. Conducted a research study and stated that lack of alternate resources for fuel wood, timber and fodder are the main and first causes of deforestation in Dir Kohistan. According to them 83% of survey respondents the main cause of deforestation in Dir Kohistan is lack of alternate resources in which the main item is fuel wood. Global patterns of deforestation indicate that timber consumption and logging activities account for more than 70% of total deforestation. Fuel wood collection, charcoal production and to a lesser extent, livestock grazing in forests are the most important drivers of deforestation. Deforestation rates may increase because the population is growing and needs more land for food, fuel wood, timber or other forest products. Average house hold need for fire wood is 15.43 kg/day in summer and 31.94 kg/day in winter, while average timber needed for a house construction is 364 cft. It is also estimated that 30% of the population migrates to lower areas during winter season and 85% of the total needs of people met from the forests. Northern areas, the forest wood is intensively using for the construction of new and repair of existing houses as was informed by 73% of the respondents. Most of the houses in all of the villages are made of wood. Even if the house is made of mud/stones or brick yet timber is need for the construction [32].

Poverty and unemployment: 75% of survey respondents the second main cause of deforestation in Dir Kohistan is unemployment. The literacy rate of Dir Kohistan is low which results in the unemployment of local people. To fulfill their daily basic needs and requirements the unemployed and jobless people of the area use these forests as a source of income by illegal manners. Poverty and over population are believed to be the main causes of forest loss according to the international agencies such as FAO and intergovernmental bodies. Poverty; Population and Pollution (3Ps) are interlinked. As the population growth and poverty increases, the area is getting more polluted and the natural environment is degrading.

Policies and management: 63% of survey respondents, one of the causes of deforestation in Dir Kohistan is non judicial policies/ rules and ineffective management. During the survey, most of the local people in Dir Kohistan complained that only the stake holders get benefit from these forests and the share (60%) of total sale proceeded from the forests goes to them. To fulfill their requirements and basic needs the local people are unable to follow the rules of

local community and government. They get the benefits from the forests by illegal means. Deforestation result in northern areas is due to the ineffective forest management strategies and bad governance by the provincial forest department. The forestry extension service offered by the department is quite ineffective and doesn't address the real problems. It is decided that all forests in Dir Kohistan belong to the state. Before this, out of the total sale proceed only 15% was paid to the stake holders /right holders, which is now 60%. In 1975 the Forest Act 1927 was implemented and the forests were declared as protected forests. In district Swat 28% of the respondents used forests for qalang and 44% of the respondents got royalty from the forests in the past [33].

Medicinal plants and fodder: Only 20% of the respondents in Mansehra used forests for the collection of medicinal plants for household needs. There were 42% of the respondents who collecting fodder from the forests for their livestock. There were 50% of the respondents who were using forest lands as pastures. Similarly in district Swat, about 42% of the respondents were collecting medicinal plants from the forests for domestic use. In this village, 22% of the respondents told that they cut the trees from the forests and sell the wood to earn the cash income.

Black marketing: 53% of survey's respondents one of the main causes of deforestation in Dir Kohistan is black marketing of timber. The people complained that the staff of FDC, Sheringal is not honest in their duty and take bribes from the smugglers. Foresters take bribe from the villagers and outsiders are allowed to cut trees. Similarly the higher forest officials take heavy amount of money from the timber smugglers and allow them to cut the trees [34].

Daily livelihood activities causing deforestation

Daily life activities also play a key role in forest degradation. About 90% of the interviewees confirmed that the process of deforestation results directly and indirectly from livelihood activities of the local people. In this study different livelihood activities were noted and these are also highlighted to produce varied impacts. The frequency of deforestation respondents (43%) indicated that use of wood as fuel exists among the top factor resulting in deforestation. Chainsaws operation is also among the daily life activities resulting and causing deforestation. Deforestation is mostly caused by use of wood as fuel and agriculture though the impacts from the other activities are recognizable. Some interviewers suggested that chainsaw operation destroyed forests much more than other livelihood activities because it occurs deep in the core of the forests as compared with the other livelihood activities which are most often carried out on the fringes of the forests. Quite apart from that, the felling of trees by chainsaw operators is disputed to be carried out indiscriminately. As a result of this, they hardly consider if a tree is harvestable or not [35].

Conclusion

Forests provide a protection to the biodiversity and protects the soil cover and regulates hydrological cycle, atmospheric temperatures and help in militating against the impacts of climate change. With the increasing population and urbanization trend there is an increase in the rate of deforestation with has resulted in the disruption of natural atmospheric and climatic patterns and enhanced the devastating impacts of natural hazards.

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