

# Climate and forest cover changes in district Skardu, Gilgit-Baltistan, Pakistan: A Community Perspective

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**Abstract**—The country, Pakistan has only five percent (5%) land cover is under forest which is on decline rapidly. Most of the forest is in the northern areas but several factors are influencing negatively. Climate change phenomenon has expedited deforestation. With increase in population, pressure on forest in Baltistan has also increased while climate change factors are unfavorable for its regeneration. Present study was aimed at investigation into community perception on climate change and forest cover changes in district Skardu, Baltistan. Research revealed that forest cover has on decline (either highly decreased or decreased) like vegetation cover which has also decreased, particularly near villages more as compared to pastures. Similarly, temperature has increased in winter and spring as compared to summer and autumn. Snowfall has decreased during spring more as compared to winters. Contrast to snowfall, rainfall has increased in spring followed by winter, autumn and summer. Glacier sizes are shrinking and monsoon floods have highly increased flowed by melt water increase in channels. Due to change in other climatic factors, crop sowing, fruiting and harvesting periods have prolonged and have a backward shifting trend. Diseases on the plants have increase but in contrast annual yield has increased. Overall indigenous biodiversity has decreased but new bird species have increased. We conclude that there is a visible but unfavorable change is underway forcing every corner of life to shift and adjust itself with new adaptation strategies. Agro pastoral communities in the area feel a threat to their livelihood options if these pathetic changes continue in the future as their reliance has increased on natural resources and ecosystem services for their survival. Climate change and forest decline are some physically verifiable factors and phenomenon and not a simple scientific theory in the lives of rural communities of Baltistan like rest of Gilgit-Baltistan. Government, non-government and civil society organizations need to consider diversification of livelihood

options and impacting on adverse factors contributing into climate change undesirably in the area.

**Keywords**—Livelihood, agricultural transformation, agro-pastoral, adaptation, diversification, Karakoram, global warming.

## I. INTRODUCTION

According to country's land estimation, Pakistan carries only 5% forest cover (Government of Pakistan, 1991). In 2002, International Union for Conservation of Nature this cover is depleting rapidly, particularly in the mountainous area (IUCN, 2002). There are several factors accelerate declining of forest cover in the country but most conventionally it is believed that deforestation in district Skardu is due to over reliance of local communities on the forest (Government of Pakistan (GoP), 1991; Food and Agriculture Organization, 1998; Sheikh and Aleem, 1975). It is evident that there is a significant relationship between the population growth and the deforestation phenomenon across mountainous areas of Karakoram, Himalaya and Hindukush (Eckholm, et al, 1976). In other words, not only there is a relationship between deforestation and population growth but number of floods and soil erosion as well and environmental degradation as well. It is therefore, Theory of Himalayan Environmental Degradation 'continues to influence national environmental policies in the region (Blaikie and Muldavin, 2004). Climate change has supplemented the erosion of natural cohesion and rich natural resources (Reid et al. 2008). Such an invisible fueling can transform agriculture lands into deserts and biodiversity losses (Foley et al. 2011). Communities are either not aware of the importance of biodiversity or climatic change or they are enforced in the hands of human livelihood limited options (Panayotou, 1994). Some studies suggest that the climate changes impact on species richness including plants, birds and animals in Basho Valley (Velle,

1998; Gudbrandsson, 2002). Furthermore, according to Stein-sholt et al. (1998) that the government authorities themselves involved in both legal and illegal commercial harvesting of timber. Present study was meant to document community perception on forest cover changes and climate change in the district of Skardu.

## **II. MATERIAL AND METHOD**

**Study area:** This questionnaire based purposefully sampled study was carried out during July-November, 2016, in different areas of district Skardu including Kushmarah, Khrgrong, Abbas Town, Kowardu, Eidgah colony, Aliabad, Olding and Jinnah Town. District Skardu is one of the administrative unit of Northern Pakistan, recently renamed as Gilgit-Baltistan.

**Sampling:** A total of two hundred (N=200) interviews were conducted using a standardized instrument from people of both genders of age fifty (50) and above. Study has more focus on the changes experienced during the last ten years or more.

**Parameters studied:** Different climate and its change related parameters were taken into account to gather data. These parameters are; rainfall (frequency, period and intensity), snowfall (frequency, period and intensity), monsoon flooding (frequency, period and intensity), glacier (size, melting, melting time), temperature (season-wise changes), cropping (sowing, fruit bearing and harvesting period, yield, diseases and crop types), forest cover (near village, in pastures), biodiversity (species richness, birds, herpeto fauna, mountain angulates), diseases on plants and fuel consumption.

## **III. RESULTS**

**3.1: Rainfall:** According to 90% respondents' rain fall in summer has either increased or highly increased in the area. Rests of 10 % interviews believe in decrease (5%) and no change respectively. According to 55% respondents rain fall in autumn has either increased or highly increased in the area. Rest of 45 % interviews believes in no change (35%) and unknown (10%). According to 50% respondents' rain fall in winter has either increased or highly increased in the area. Rest of 50 % interviews believes in no change (30%), decreased (15%) and unknown (5%). According to 50% respondent's rain falling springs have increased in the area. Rest of 50 % interviews believe in no change (45%) and decreased (5%).

**3.2: Snowfall:** According to 80% respondent's snow fall in winter has either decreased or highly decreased in the area.

Rest of 20 % interviews believe in either in highly increased (5%), increase (5%), no change (10%). According to 75% respondent's snow fall in spring has either decreased or highly decreased in the area. Rest of 25 % interviews believe in no change (15%) and increased (10%).

According to 95% respondents' amount of snow has either decreased or highly decreased in the area. Rests of 5 % interviews believe in highly increased.

**3.3: Temperature:** According to 90% respondents' temperature variation in summer has either increased or highly increased in the area. Rest of 10 % interviews believe in decrease (5%), no change (5%). According to 50% respondent temperature variations in autumn have increased in the area. Rest of 50 % interviews believes in no change (40%), decreased (5%) and unknown respectively. According to 75% respondent's temperature variation in winter has either increased or highly increased in the area. Rest of 205% interviews believe either in decreased (15%), highly decrease (5%) respectively. According to 55% respondent's temperature variation in spring has either increased or highly increased in the area. Rest of 45 % interviews believe in no change (40%) and decreased (5%).

**3.4: Monsoon Flooding:** 100% respondents noticed monsoon flooding has either increased or highly increased in the area.

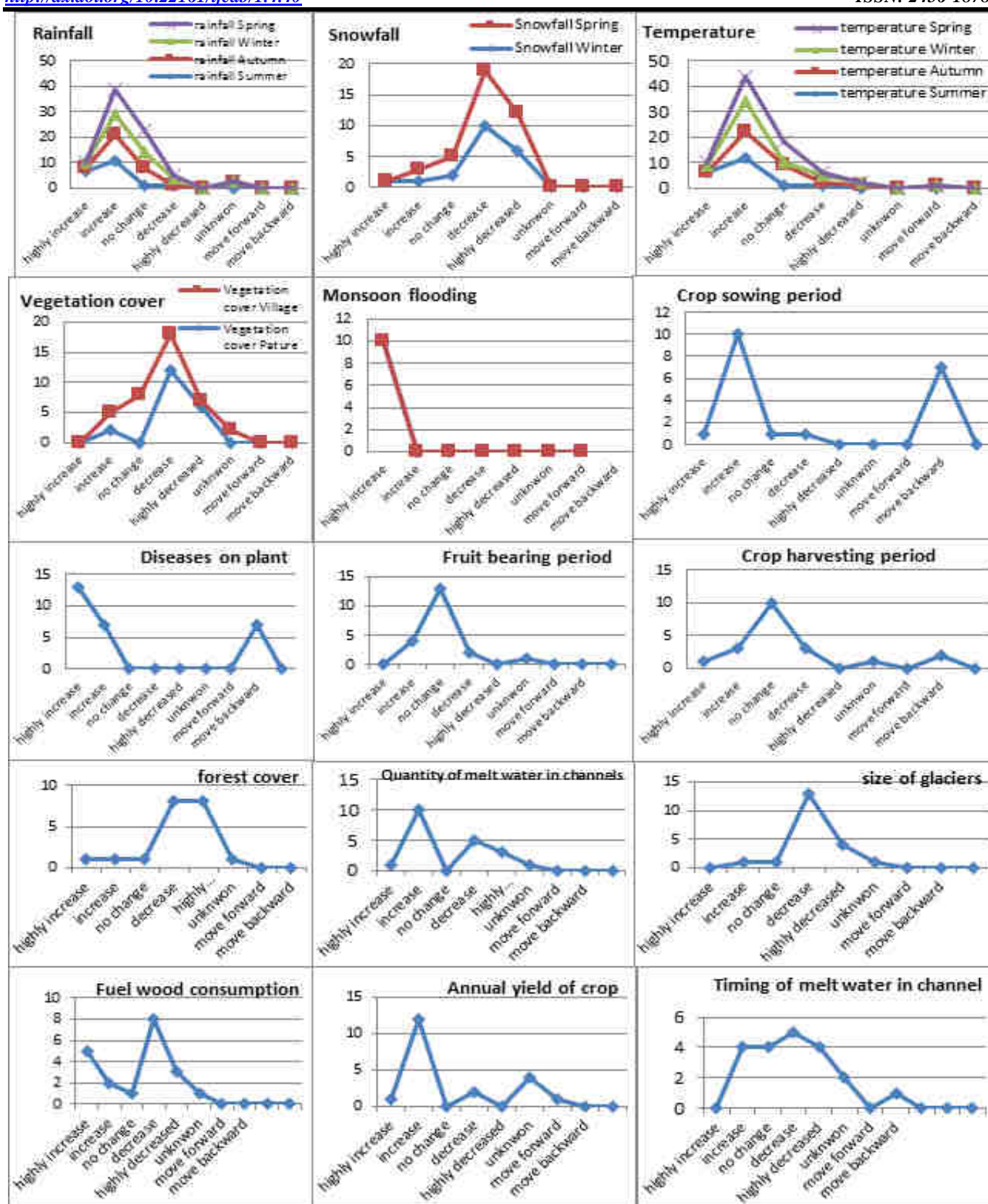
**3.5: Vegetation Cover:** According to 90% respondent's vegetation cover of pasture has either decreased or highly decreased in the area. Rest of 10 % interviews believes in increase (10%). According to 40% respondents vegetation cover of village have no change in the area. Rest of 60 % interviews believe either in highly decrease (30%), highly decreased (5%), increased (15%) and unknown (5%).

**3.6: Plant Diseases:** 100% respondents noticed that Diseased on plant has either increased or highly increased in the area.

**3.7: Crop Sowing, Fruit Bearing and Harvesting Period:** According to 55% respondent's crop sowing period has either increased or highly increased in the area. Rest of 45 % interviews believe in move backward (35%), no change (5%) and decreased respectively.

According to 65% respondents fruit bearing period have noticed no change in the area. Rest of 35 % interviews believe either in highly increased (5%), increase (5%), no change (5%) and unknown respectively.

According to 50% respondents for crop harvesting period have no change in the area. Rest of 50% interviews believe either in highly increased (5%), increase (15%), decreased (15%) unknown (5%) and (10%) move backward.



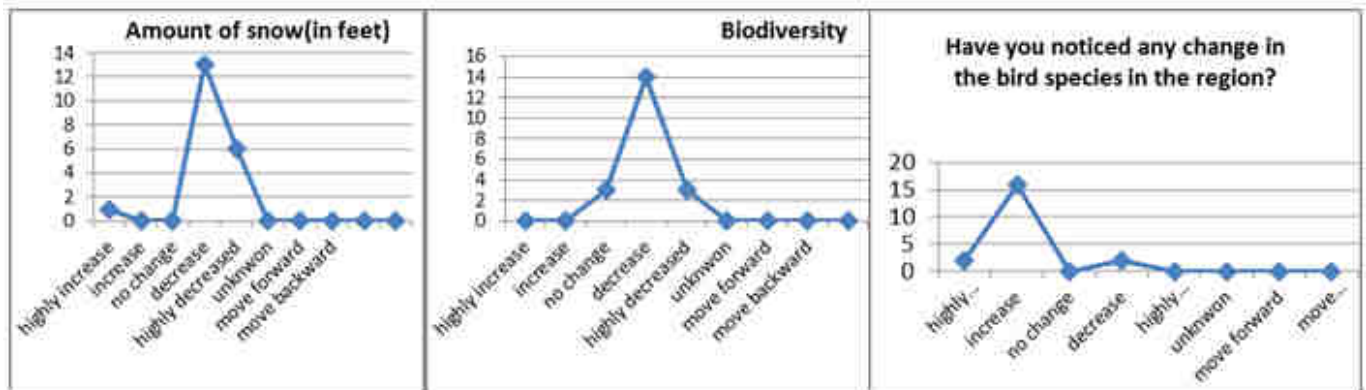


**3.8: Annual Yield:** According to 65% respondent annual yield of crop has either increased or highly increased in the area. Rests of 35 % interviews believe in unknown, (20%), decreased (10%) and (5%) move forward.

**3.9: Forest Cover:** According to 80% respondents forest covers has either decreased or highly decreased in the area. Rest of 20 % interviews believe either in highly increased (5%), increase (5%), no change (5%) and unknown respectively.

**3.10: Glacier Size:** According to 85% respondents noticed change in size of glaciers has either decreased or highly decreased in the area. Rests of 15 % interviews believe in increase (5%), no change (5%) and unknown respectively.

**3.11: Fuel Consumption:** According to 55% respondents' fuel wood consumption has either decreased or highly decreased in the area. Rest of 45 % interviews believe either in highly increased (25%), increase (10%), no change (5%) and unknown respectively.



**3.12: Snow Melt Quantity and timing:** According to 45% respondents timing of melt water in channel has either decreased or highly decreased in the area. Rest of 55 % interviewees believe in increase (20%), no change (20%), unknown (10%) and (5%) move backward.

According to 55% respondents' quality of melt water in channel has either increased or highly increased in the area. Rest of 45 % interviews believe either in highly decreased (15%), decrease (25%) and (5%) unknown.

**3.13: Biodiversity:** According to 90% respondents noticed change in the bird species has either increased or highly increased in the area. Rest of 10 % interviews believe in decreased. According to 85% respondents noticed change in mammals/reptiles and amphibians species has either decreased or highly decreased in the area. Rests of 15 % interviews believe in no change.

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