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Impact of Climate Change on Livelihood Pattern of Pastoralist in the Lower Himalayan Region of Jammu and Kashmir: With Special Reference to Poonch District of Jammu and Kashmir, India

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Abstract:

Climate change has become a social, economic and environmental challenge facing humankind and receives much attention in the public debate. The threats posed by climate change cut across many different sectors—humanitarian aid, development, health, livelihoods. Pastoralists are people who depend for their living primarily on livestock and pastoralism is the use of extensive grazing on forestlands for livestock production. Different environmental factors like climate change have influenced pastoralists. The impact of climate change has caused changes in traditional livelihood pattern of most pastoral groups, nomadic and transhumance alike. Pastoralists mostly depend on forests for grazing their live stocks. The competition for access to forest resources leads conflict among them influencing their livelihoods and land use systems. Pastoralists are facing threats from climate change. Increased frequency of extreme weather events including floods and droughts may overwhelm the existing resilience of pastoral. Climate change strengthens horizontal inequalities among pastoralists through compounding stress on existing socio-economic disparities, different groups within a single society are the most affected disproportionately. Pastoralists play an important role in dry lands of Shivalik (Lower Himalayas) hills in Jammu and Kashmir, as they depend on fodder for livestock and water from ecosystem in water-scarce areas. However, pastoralists in Lower Himalayas are facing threats from climate change as it influence diseases affecting livestock and their livelihoods. Therefore, uncertainty remains with regard to climate change impacts of livelihoods on pastoral population.

Keywords: *Climate change, pastoralist, livelihood, migration, livestock*

1. Climate Change

Climate change refers to spatial and temporal fluctuations in climacteric factors. It is a change in the state of the climate over a period of time. It can be recognised by changes in the mean temperature over a long period of time. It has become a social, economic and environmental challenge facing humankind and receives much attention in the public debate. Climate change will occur more frequently in the future. According to Intergovernmental Panel on Climate Change (IPCC, 2007), “*Climate change is a change in the state of the climate that can be identified by changes in the mean temperature and/or the variability of its properties and that persists over an extended period of time, typically decades or longer.*”

The global temperature have already increased by 0.7 degrees over the past century and are projected to further increase by a minimum of 1.8 degrees to a maximum 4 degrees before the end of this century, depending on our ability to act quickly to combat climate change as stated by Ananthapadmanabhan et al. (2007). According to UN Human Development Report (2007-08), the effect of the rising temperatures across the Earth’s surface will lead to changes in average temperatures, rainfall patterns and monsoon timings. Indeed the climate has already begun to change and if we do not act fast, it has the potential to undermine the human development in Indian and across the world.

The Intergovernmental Panel on Climate Change (IPCC) in its global climate scenarios (Assessment Report, 2001) has indicated that the pattern of global warming will be more pronounced at high altitude zones, especially those in the tropics and sub-tropics (of which the Himalayas is the largest range)-up to 3 to 5 times faster warming than in the rest of the world. Alpine glaciers, such as the ones in the Himalayas, are particularly sensitive indicators of climate change.

There is credible evidence that the glaciers in the Kashmir Himalayas are responding to the climate change. The rising temperatures and scanty snowfall in the winters have reduced the mass of the glaciers. Several dozens of smaller glaciers have completely vanished during the last 50 years in the state. The rate of recession of the Kashmir Himalayan glaciers is a cause of concerns for the common man and especially for the pastoralists.

1.1. Pastoralists

Pastoralists are people who depend for their living primarily on livestock and pastoralism is the use of extensive grazing on forestlands for livestock production. Pastoral population inhabit in those areas, where potential for crop cultivation is limited due to

poor rainfall, steep terrain or extreme temperatures. Pastoral groups are of two types: first, those who practice nomadic pastoralists and second, and those who are transhumance pastoralists. Nomadic pastoralists do not have a permanent homestead. They do not practice agriculture. Therefore, they live directly on the products of their livestock and herds. Pastoralists are those communities which rely on mobile livestock rearing as a livelihood strategy for human survival and socio-economic development upon marginal arid and semi-arid lands (Carney et al, 1999).

Transhumant pastoralists regularly return, usually seasonally, to a home base. The impacts of outside influence have caused changes in traditional livelihood pattern of most pastoral groups, nomadic and transhumant alike. Environmental factors have influenced pastoral conflicts over common property resources such as pastures, forest and resources and grazing lands. Both nomadic pastoralism and transhumance are based on efficient use of seasonally abundant resources in marginal environments without degradation. They, thus, require the support of local policies to continue within carrying-capacity limits (Blench, 2001).

1.2. Livelihoods

Pastoralists depend on livestock population for their livelihood. A livelihood is defined as '*the capabilities, assets and activities required for a means of living; a livelihood is sustainable when it can cope with, and recover from, stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihoods opportunities for the next generation*' (Chambers and Conway, 1992). The types of livestock kept by pastoralists depend upon the surrounding environment and it varies according to climate, environment, water and other natural resources and geographical areas. Livestock may include buffaloes, goats, sheep, yaks, horses and cows.

Pastoralists are those people who depend totally on their livestock. For pastoral population, livestock represent wealth, security and a resource base for meeting livelihood needs. According to Birthal et al. (2002) livestock is an important source of income and employment for this section of the society and also helps in alleviating poverty and smoothening of income distribution. Livestock makes multi-faceted contribution to socio-economic development of nomadic people. Pastoral nomads are usually self-sufficient in terms of food and most other necessities. Their livelihoods depend on their knowledge of the surrounding ecosystem and on the well-being of their livestock. According to Raziq (2009) the pastoral livestock species are well adapted to the local ecology and produce under very low input conditions.

Agro-ecological conditions and physical characteristics of range resources are critical in shaping the socio-economic livelihood patterns of pastoral communities, as they are characterized by highly variable and unpredictable resource endowment. Pastoralists released the pressure on vegetation around permanent water points by widely dispersing in different areas during the rainy seasons in order to use surface water, resulting from the rains, and the subsequent green pastures (Shazali, 1999).

1.3. Impact of Climate Change on Pastoralists Livelihood

Mainly, three factors affect vulnerability of pastoralist to climate change: first, extent of dependence on natural resources and ecosystem services; second, extents reliance of societies on climate sensitive resources and services; and third, adaptive capacity to change in these resources and services. Climate change is expected to disproportionately affect pastoralists in developing countries. These people have successfully faced threats linked to climate variability in the past, even if climate change likely will increase the expected frequency and intensity of such threats (Mortimore and Adams 2001; Scoones 2001).

According to Spooner (1973) all nomads have different social and cultural features that occur exclusively among nomads. Pastoral nomads are different in lifestyles, means of subsistence and in various types of social organisation. Patterns of social organisation they develop depend on their specific ecological, cultural, political or historical circumstances. Pastoral populations are divided into different groups like tribes, clans and lineages. The social organisation of pastoral nomads is based on kinship.

Krik Bride and Grahn (2008) reveals that even though the dry lands are known for their unpredictable and variable climate, the unprecedented rate and scale of human induced climate change is beginning to pose more problems. Pastoralists have been managing climate variability for millennia. However, the unprecedented rate and scale of human-induced climate change is beginning to pose more problems.

Pastoralists also contribute to the production and stability of fragile environment of Shivaliks. Livestock grazing by pastoralists influence quality of agro-biodiversity and pastures in hilly areas. Improved biodiversity and pastures maintained through systematic pastoralists grazing reduces soil erosion, maintains soils, facilitates water retention capacity of the soil and also provides habitat for wildlife.

According to Watson et al. (2000) the pastoralists as a production system has the greatest potential to meet the subsistence needs of humans, maintain ecosystem health, and minimise the negative impacts of climate change through proper grazing managements in arid and semi-arid areas. Pastoralists also produce a wide variety of goods and services like meat, milk, hides income generation, transport, etc. Pastoralists have also traditionally managed dry lands sustainably. Pastoral population can also contribute positively to reduction of natural disasters such as fires and drought through adapting sustainable land management practices.

Pastoralists mostly depend on forests for grazing their live stocks. Forests also protect the agricultural soils and water resources to sustain livelihoods of pastoral population. Due to climate change, there are resource base conflicts between pastoralists. The competition for access to forest resources leads conflict among them influencing their livelihoods and land use systems. The agro-pastoral and pastoral systems may become more important to the climate changes. Pastoralists play an important role in dry lands of Shivalik hills in Jammu and Kashmir, as they depend on fodder for livestock and water from ecosystem in water-scarce areas.

However, pastoralists in Shivaliks are facing threats from climate change as it influence diseases affecting livestock and their livelihoods. Extreme weather events like floods and droughts may affect the pastoral resilience to climate change and livelihoods. Therefore, uncertainty remains with regard to climate change impacts on livelihoods of pastoral population of the Shivaliks. According to Henson (2006), climate change and weather extremes (drought, floods, storms) will occur more frequently in future. Climate change also will affect the length of growing seasons, and crop and livestock yields, and bring about increased risk of food shortages, insecurity, and pest and disease incidence, putting populations at greater health and livelihood risks.

1.4. Pastoralists in India

Climate change has imposed a difficult challenge to the planet in the 21st century. The implicit and explicit impact of climate change would effects on the multiple dimensions of human life and bio-diversity. It is estimated that the developing countries would suffer most because of this climate change and because of high marginalised population which is most vulnerable to climate change. Climate change has been experienced all over the world today as one of the most significant challenges facing human society. The global climate change is expected to have disproportionate negative impact on developing countries, particularly in Africa, south Asia and parts of Latin America.

According to Aggarwal (1999); Gooch (1992) and Fratkin (1997) India is home to a large number of pastoral Groups like *Golla* (cattle herders) and *Kuruma* (sheep herders) of Andhra Pradesh; Rabari (cattle, sheep and goats herders) and *Bharwad* (small stock herders) of Gujarat; *Kuruba* (sheep herders) and *Dhnagar* (sheep herders) of Karnataka; Raika (camel, sheep and goat herders) and *Gujjars* (buffalo and sheep herders) of Rajasthan and *Gujjars* (buffalo herders) and *Bakarwals* (small stock herders) of Jammu and Kashmir. Migratory pastoralism is common thorough out the Himalayas. All of these herders continue a long-standing tradition of migrating up to the alpine pastures of high Himalayas for summers and descending to the low lying Himalayas foothills in the winters Phillimore (1989).

The impacts of climate change are quite clear and louder in the state of Jammu and Kashmir. As with the rise in the temperatures, particularly the winter temperatures, we are receiving lesser snow precipitation in winter. Snow and glacier melt is very important for the state of Jammu and Kashmir as various sectors of the economy are dependent on the waters originated from the melting of snow and glaciers in the mountains. It is, therefore, quite clear that the climate change has impact almost on every sector in the state; be it drinking water supplies, irrigation, hydropower generation, wetlands etc.

1.5. Mobility used as the Coping Mechanism to Climate Change

Many scholars namely Barth (1961); Schweizer (1970); Ehlers and Goodell (1975); Garthwaite (1983); Tapper (1997); Ehlers and Schetter (2001) have studied that pastoralists use different survival strategies to cope with the changing climate. They use mobility, utilizing marginal resources and many other techniques as the coping mechanisms to deal with the climate variability.

Similarly, Scoones and Adwera (2009) and Yohannes and Mebratu (2009) have revealed that mobility is used by most pastoralist groups to deal with uncertainty and risk associated with climate change. This helps them to “follow the rains” and increases the availability of forage, avoid pests and diseases, and avoid conflict with other groups using the same resources. According to Hudson and Hudson (1980) the exploitation of seasonal pastures is not the only reason that livestock herders move.

Trujano, C.Y.A (2008) the most obvious pastoral adjustment to scarcity of resources is to move elsewhere; nomadism itself is created by such a necessity. Pastoralists regularly move short and long distances to take advantage of seasonal pastures or to flee a drought-stricken area. According to UNDP report (2006) migration cycles are changing through time, due to changes in climate and other physical elements. New cycles, adjusting to surrounding situations, evolve gradually with droughts, and in response, both nomads and semi-nomads have resorted to more crop cultivation.

As assessed by McKee (2008) pastoralists use different mechanisms to cope with different situations like high climate variability. It includes moving their livestock and families from one place to another, keeping different animal species (and, within species, sometimes different types of animals), making reciprocal arrangements with other pastoralist groups for access to pasture and water, developing water-conservation techniques, observing early-warning signs of impending drought and practising complementary livelihood activities (e.g. trade or, where possible, cultivation).

2. Pastoralists in Poonch District

The highest concentration of Gujjar community found in Poonch and Rajouri districts followed by Anantnag, Udhampur and Doda districts of J&K State. STs Population in Poonch is 1, 76,101 while on the other hand in Rajouri it is 2, 32, 815 which is 36.9 % and 36.2 % of the total population of the two border districts respectively (Census 2011). During last decade majority of the Gujjar population has become sedentarized, however, Gujjars and Bakkarwals were mostly nomadic tribes of Jammu and Kashmir (Suri, 2014).

According to Bhardwaj (1994) Gujjar community which was primarily a nomadic community, now-a-days have settled to a large extent and have settled in permanent villages in the plains bordering the foot hills and have taken to cultivation of land as their primary occupation. Moreover, there are semi-settled or sedentary transhumants Gujjars who mix the cultivation of land with nomadism as stated by Kango & Dhar (1981). During summer they move to the lower and middle mountain areas and Pir Panjal pastures with their flock of buffalos where they engage in cultivation and come back to the plains in the winters (Khatana 1992).

Bakkarwals are also known as the goat (bakri) breeders who mostly go to the high altitudes of Himalayas and spend their winter in plains and foot hills of Shivaliks. At the time of their journey to the hills during summer when the snow melt and the pass open, they

trek through the remotest areas of the mountains to reach the higher grazing lands of Pir Panjal range where they rest in temporary huts in the valley and graze their herd of sheep (Rao and Casimir 1982).

The pastoralists of Poonch districts are changing their livelihood pattern due to changing climate. They try to keep different types of animals according to the prevailing situation. During droughts they keep sheep and goats instead of buffaloes and cows.

3. Conclusion

Mobility is perhaps the most common and seemingly natural response to environmental risks. It is especially important as an adaptation practice for pastoralist sub-Saharan Africa, west and south Asia and most dry regions of the world (Niamir 1995). For pastoralist and agro-pastoralist populations efforts to mobility could lead to greater vulnerability and lower adaptive capacity (Davis and Bennet, 2007, Agarwal 1999). Pastoralists have adapted for centuries to climate, social, political and ecological processes. They have adapted to political, societal and environmental changes by migrating, cooperating with other ethnic groups or taking up agriculture among many other activities (Stenning 1960, Loiske 1990). Numerous livelihood changes occur among pastoralists, but perhaps the most prevalent now are diversification into agriculture and intensification of livestock production (Homewood et al. 2001; Little et al. 2001a; BurnSilver et al. 2008). As stated earlier livestock is an important source of income and employment for this section of the society and also helps in alleviating poverty and smoothening of income distribution.

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