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Impact of Climate Change on Livelihoods: Adaptations Measures of Chepang Community

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Abstract

This paper analyzes impacts of climate change on livelihoods of Chepang community and their adaptation measures. The objective of this article is to assess adaptation measures practiced by Chepang community. To accomplish the desire objectives both primary and secondary data are used thoroughly. Primary data is collected via different tools of data collection such as questionnaire, observation, interview and so on. Secondary data are collected through document study. Shortages of raw materials, low agriculture productivity, shortage of spring water etc. are found as the major impacts of climate change in the study area. The data shows that cultivation is highly affected by the pattern of climate change. Series of local adaptation measures are being carried out in the sector of agriculture, water and forests, which are more traditional in approach and based on local level knowledge. The adaptation practices applied by the locals are more traditional approaches whereas some approaches are based on the support of different governmental and non-governmental programs.

Key words: Adaptation measures, climate change, indigenous, livelihood strategy and Chepang community.

Introduction

Climate change is a burning issue in the world. It is a long term shift in the climate of a specific location, region or planet. The shift is measured by changes in features associated with average weather, such as temperature, wind patterns and precipitation. Climate change is the biggest emerging environmental challenge to date (Alam, et al., 2004). Change in an average weather pattern of an area over long period of time is known as climate change. The climate system is a complex, interactive system consisting of the atmosphere, land surface, snow and ice, oceans and other bodies of water as well as living creatures. Climate in a narrow sense is usually defined as the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands of years. The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization (Maharjan & Joshi, 2012). United Nations Framework Convention on Climate Change, in its Article 1, defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the

global atmosphere and which is in addition to natural climate variability observed over comparable time periods". Climate change refers to a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer (IPPC, 2007). Thus, climate change refers to any change in climate over time, whether due to natural variability or as a result of anthropogenic activities.

In Nepal, there are large numbers of indigenous community who are highly dependent on forest and biodiversity resources for fulfillment of daily needs of timber, fuel-wood, fodder, grass, leaf litter, wild animals and water resources. In addition, majority of mountain people are generating their income solely by collecting and trading the timber and non-timber forest products. In this scenario, it is crucial to explore the impact, existing adaptation practices of those communities and potential adaptation strategies to enhance the resilience of biodiversity and its dependents to fight with negative impact and institutionalize the positive impact of climate change (Oxfam, 2011). Chepangs are the earliest known inhabitants of Nepal and one of the most backward indigenous nationalities of Nepal. Nepal Federation of Indigenous Nationalities has categorized Chepangs "as the second most backward/marginalized community" from the bottom list from among the 59 marginalized Indigenous Communities listed by it (Nepal Chepang Association). Total population of Chepang is 68399, out of which male population is 34620 and that of female population is 33779 (CBS, 2011). Chepang live in the wildest imaginable state of nature and many of them still lead a primitive life. Although about 70.5% of Chepang speak their Mother tongue belonging to the Tibeto-Burman family yet they have no written script. Mass illiteracy, extreme poverty, primitive agriculture, lack of food, high incidence of malnutrition, landlessness and living in the vicinity of the dense forest in the isolated rugged Mahabharat range are the major problems faced by Chepang community. Their subsistence economy is based on forest resources (Rai, 2009). While the Chepangs were living a nomadic life, most of the land good for cultivation was occupied by other communities, leaving them only the sloped, arid and stony land to choose from. Although many Chepang practice shifting cultivation, but they do not own the land, mainly because they do not have citizenship certificates required for the land ownership papers and lack of citizenship certificates means no rights to own land, secure jobs even in private corporation and no government loan and banking supports as well as no right to vote and protection from the state (Chitwan Declaration, 2005).

The Chepangs themselves follow Animism, although they are strongly influenced by both Hinduism and Buddhism, which came from the Tamangs just north of them. They observe all the Hindu festivals of Dashain, Tihar and Sakrantis besides their own tribal festival Nwagi, which is performed on a Tuesday during third week of Bhadra (some day in August and September). Chepang are backward ethnic communities belong to a well defined traditional area in the south of Dhading, the west of Makawanpur and east of Chitwan along the steeper slopes of Mahabharat range of the mid-Nepal (Rai et al., 2067). Very few of these hunting tribal people started deriving subsistence from agriculture. Otherwise, hunting, wood collection etc. has been their foremost living subsistence.

Livelihood comprises the capabilities, assets (including both material and social resources), and activities required for a means of living (DFID, 2002). A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base. In social sciences, the concept of livelihood extends to include social and cultural means, i.e. the command an individual, family, or other

social group has over an income and/or bundles of resources that can be used or exchanged to satisfy its needs. A person's livelihood refers to their "means of securing the basic necessities-food, water, shelter and clothing- of life". Livelihood is defined as a set of activities, involving securing water, food, fodder, medicine, shelter, clothing and the capacity to acquire above necessities working either individually or as a group by using endowments (both human and material) for meeting the requirements of the self and his/her household on a sustainable basis with dignity.

Research Questions

- How climate change affects the livelihoods of Chepang community?
- What are the adapted indigenous measures taken by Chepang community?

Materials and Methods

This article is based on both primary and secondary sources of data for tracing out the major conceptual issues and survival measures adopted by local community against the impacts of climate change. According to census 2011, there have been 450 households of Chepang community in Chhatiwan and Shikharpur rural municipalities of Makawanpur district. Out of total households only 68 households (15%) were taken as a sample through purposive sampling technique. The primary data were collected through field survey method using the tools: questionnaire and interview and secondary data through the related document study. The paper seeks to investigate impact of climate change in livelihoods and adaptation measures adopted by Chepang people as per their indigenous practices. Due to the constraints of time materials and resources, this paper had not covered the wider area. Hence, the paper is delimited as follows: Impact of climate change on livelihoods pattern, medium of livelihoods, adaptation measures and two rural municipalities of Makawanpur District.

Results: Impacts of Climate Change on Livelihoods of Chepang Community

Climate change has direct effects on livestock productivity as well as indirectly through changes on the availability of fodder and pastures. Climate change will have far-reaching consequences for agriculture that will disproportionately affect the poor. Climate change threat to agriculture is now unambiguous, but the exact magnitude is uncertain because of complex interactions and feedback process in the ecosystem and the economy.

Medium of Livelihoods

Most of the Chepangs settlements are scattered in the sloppy marginal land and in between of gorges in the mid or high hills. The selection of hills and forested areas is a trait of forest dependency, where they acquire wild animals and food for survival. Now some of them are moving to river basins and plains due to deforestation, population pressure and influence of commercial economy. The traditional village clusters are isolated in nature as the houses are built near the cultivable or slash and burn type of land, irrespective of the location, be that nearer to the streams or forest. This facilitates them to cultivate the land, forage the wild food items and help them to raise domestic animals. Their houses are connected by small foot trails. Almost all Chepangs rely on slash and burn farming and wild foraging. The main pattern of farming is rotational where crops are cultivated shifting one place to another every year after clearing the forests and bushes. Though their main occupation is cultivation, they hardly meet their ends. For the last decade, many organizations are helping and teaching Chepangs to cultivate seasonal and off-seasonal vegetables for additional income. This has helped them to earn

additional income and support in family needs particularly to maintain the livelihood pattern. The medium of livelihoods of the respondents is given below:

Table 1. Medium of Livelihoods

Medium	HHs	Percentage
Agriculture	36	53
Labour	32	47
Total	68	100

(Field Survey, 2014).

According to above Table, 53 percent households occupy subsistence agriculture as a major livelihood and remaining 47 percent occupy the labour for their survive. Traditional livelihood of the Chepangs is dependent in forest-based agro-pastoralism, although departure from this practice is slowly emerging. They practice Khoriya Kheti. They are mostly dependant on nature. The food culture of the Chepangs can be explained in relation to eco system. They collect many natural products such as Githa (*Dioscorea Sativa*), Bhyakur (a kind of creepers), Chuinya, Tanki, Sisnu, Niuro, Kholesag, Tama, Jalungo, Chyau (mushroom), and Bharlang (a kind of root). Hunting and fishing are other food resources of the Chepangs. They hunt bats, crabs, Ghoral (wild goat), Banel (wild pigs), larva and pupae of Aringal (hornest), Ryanka (Barulo), Ngol (Bachhim), and hornets. Bee keeping or honey collection is also the food resource or occupation of the Chepang.

Adaptation Measures

The adaptation practices applied by the locals are more traditional approaches whereas some approaches are based on the support of different governmental and non-governmental programs. The existing practices undertaken by local respondents are defined herewith. Temperature is continuously increasing due to the climate change which has supported to create the favorable environment to outburst the insect and disease in forest species and agriculture farming. Mainly insect and disease have been increasingly affecting to the forest fodder and tree species however they have not applied any measures to reduce those effects in both sites except shifting the species when one species affected more. In agriculture farming *Chepang* households have used the insecticides but in these days it does not work properly to prevent the insect and disease even in the agriculture crops. Non-timber forest products are major sources of food, medicine and income in both study area.

Very few households involved in conservation of NTFPs habitat and have planted Chiuri in their private land. Thus, very few households are aware about NTFPs' harvesting methods otherwise all people have followed same season and indigenous methods for harvesting. Agriculture is mainstay of livelihoods in both sites therefore they have done various local adaptation practices to fight against extreme climatic events. Out of the sampled households, nearly 63 percent households have imported food from market when food deficit occurs. Similarly, a very few households used traditional food storage practices i.e. storage in *bhakari*, *Dhokro* etc. *Chepang* communities have planted perennial crops where the floods and landslide risk prevailed. Community forests have controlled haphazard collection and considered sustainable forest management. Reduction of haphazard use of fuel wood, use of agriculture residue, promotion of good agro-forestry practices are the major adaptation strategies

of *Chepang* community except very few households use the improved cooking stove. A good long term adaptation was noticed in *Chepang* community is promotion of agro-forestry practices. The *Chepang* communities have practices of good agro-forestry practices which are insufficient but were a good initiation to adapt with fuel wood deficit in long run. Increased drought, forest fire and outburst of insect and disease have affected to the regeneration and growth of grasses and fodder during the winter and spring season. According to the respondents, over and unsustainable harvesting and over grazing are the next triggering factors leading to low production and regeneration of palatable species for livestock and wildlife. But all these adaptation practices are based on indigenous knowledge.

Conclusion

Due to the change in temperature and emission of green house gases, natural water cycle is affected whereby irregular rainfall pattern has occurred. Irregular rainfall has negative effect. Around 60 percent household said, effect of irregular rainfall lies on cultivation 16.5 percent said on livestock, 19.5 percent said on forestry and remaining 4 percent said on other sectors. The data shows that cultivation is highly affected by the pattern of climate change. With the increased pressure on the natural resources due to climate change coupled with unsustainable harvesting, poaching and other illegal activities, both communities are further vulnerable to climate change as they are exclusively dependent on climate sensitive sector such as forest and biodiversity resources, water resources, agriculture farming, livestock rearing and labour.

Adaptation practices are being carried out in the sector of agriculture, water and forests, which are more traditional in approach and based on local level knowledge. The adaptation practices applied by the locals are more traditional approaches whereas some approaches are based on the support of different governmental and non-governmental programs. In agriculture farming *Chepang* households have used the insecticides but in these days it does not work properly to prevent the insect and disease even in the agriculture crops. Similarly, a very few households used traditional food storage practices i.e. storage in *bhakari, Dhokro etc.* *Chepang* communities have planted perennial crops where the floods and landslide risk prevailed. The *Chepang* communities have practices of good agro-forestry practices which are insufficient but were a good initiation to adapt with fuel wood deficit in long run. All these adaptation practices are based on indigenous knowledge.

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