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Governance Capacity for Climate Adaptation in Nepal

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Abstract - For the last few decades, global warming has become a strong threat to human development. The climate change has been affecting on water resources, biodiversity, agriculture, forestry, and public health in specific, and the way of life in general. Nepal is highly vulnerable to the negative impacts of climate change. The crux of the problem for managing climate change adaptation is the rampant poverty. In such context, this study aims to review the key challenges of climate change governance in Nepal and to determine the extent of the Nepal's climate change governance capacity. The primary data for this study was collected by administering a score-sheet to the extensively experienced persons in the field of environment and/or climate change. This paper concludes that Nepal's climate change governance capacity is of moderate level and marginally improving since 2010.

I. Introduction and Methodology

Nepal has a highly diversified ecology, within a very short span, extended from the high Himalayas in the north followed by middle hills to the low land terai in the south. Along with this ecological variation, the climate conditions also vary from alpine in the north to tropical in the south. The ecological/ to zoographical and climatic variations give rise to diverse culture and livelihood. The livelihood of around one-third of Nepal's population is based on agriculture and forest resources; and almost 65 per cent of agricultural cultivation is rain-fed (MOE, 2011a). Nepal is extremely vulnerable to the negative impacts of climate change mainly because of its diverse topography and fragile ecosystems.

The proper management of climate change adaptation has become a difficult task due to poverty or poor economic situation of the country. Nepal lacks the resources to finance its own development. More than 50 per cent development expenditure has been financed through foreign for the last 60 years. Official Development Assistance (ODA) as percentage of nominal GDP during 1990 to 2009 ranged from 3.5 to 6.4 percent (Adhikari, 2011). It indicates a moderate level of aid dependency.

According to Maple croft (cited in Oxfam, 2011a), Nepal is in the fourth position among 170 countries in the Climate Change Vulnerability Index (CCVI). It also applies for the next 30 years. Dixit (2010) categorizes Nepal's climate-related disasters into two types: (i) rapid-onset events such as cyclones, land-slides, avalanches and floods; and (ii) slow-onset events such as rising temperatures, forest fires, regional sedimentation, and accelerated melting of snow and glaciers. Most of the Nepali people have been suffering from water scarcity in dry season and from floods and land-slides in summer.

NAPA (2010) assessed the climate change vulnerability throughout the country. The vulnerability mapping was done on the basis of the integration of combined sensitivity, combined adaptation capacity, and specific and combined risk exposures. It has become a valuable data source for prioritizing the more vulnerable areas for adaptation planning considering specific climate change exposures. However, the possible opportunities created by the climate change have not yet been explored.

In the above given context, this paper aims to review the key challenges of climate change-related governance in Nepal and to determine the extent of the Nepal's climate change governance capacity.

The primary data for this study was collected in November 2011. The available literature on climate change governance in Nepal was first reviewed and identified some prominent challenges of climate change-related governance capacity in Nepal. For assessing the Nepal's governance capacity in relation to the management of climate change, a score-sheet was constructed by using eleven-point scale for each identified challenges. Thirty scorers were selected from Ministries, INGOs, and Universities by using the convenience sampling technique. The selected scorers were experienced more than 5 years in the field of environment. The score-sheet was administered through face-to-face contact as well as e-mail. Because of the time and resource constraints, the key limitations of the study are taking a small sample size and not collecting the detailed qualitative primary data. The accuracy of the primary data may not be high due to small sample size.

II. Sectoral Vulnerability to Climate Change

National Adaptation Program of Action (NAPA) has set six thematic issues of climate change in Nepal: (i) agriculture and food security; (ii) water resources and energy; (iii) forest and biodiversity; (iv) public health; (v) urban settlements and infrastructure; and (vi) climate-induced disaster.

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a) Agriculture and Food Security

Nepal is a land-locked country extended from the Himalayas in North to the low land Tarai with tropical climate in South within a lateral span of 200 km. More than 70 per cent of population lives on less than US$ 2 per day. About 85 per cent of Nepal's population involve in subsistence agriculture (ADB 2009 cited in MOE 2010). Mountain and Hill regions are not able to produce enough food to meet the local demand. NPC (2011b) states that agricultural productivity has remained stagnant or declined across the country. Its agriculture is largely dependent on the monsoon rain. The monsoon affected by the climate change is expected to modify agricultural activities due to upward shifting altitudinal boundaries and loss of biodiversity.

The adverse effect of climate change on agricultural production is mainly due to delayed or below average rain fall and sometimes flooding because of heavy rain fall. Even in the fertile Tarai, 1997, 1998, 1999, 2006 and 2008 were food deficit years (NPC 2011b). The surplus food of Tarai cannot be easily transport to the remote Hills and Mountains. For this reason, there is no guarantee of food security in the remote areas of Nepal.

b) Water resource and Energy

Water is available in the form of snow, surface water and groundwater. Hydrological system of the earth is highly complex. The volume of precipitation and evaporation is determined by temperature. Soil moisture depends upon the land system. Time, duration and amount of water available depend upon the hydrological cycle and temperature.

As a result of the climate change in recent years, the intensity of precipitation has been increasing and the temporal incidence of precipitation has been changing. The rapid melt of snow in Himalayas formed new glacial lakes and rapidly expanded the existing ones. Global warming has become an increasing threat of glacial lake outburst floods (GLOFs), floods, drought, siltation, inundation, mass wasting, erosion and water source depletion (NPC 2011b).

Cloud line and frost lines have shifted up due to warming of atmosphere. It has become a causal factor for changing rain fall patterns. The prolonged droughts have been occurring annually in Tarai region since 2005. As a result, the farmers compelled to turn way from planting cereals and embrace horticulture (NPC 2011b).

The increased global warming seriously affects on hydropower generation in long-run. Most of the hydropower plants in Nepal are based on run-off-rivers originated from high mountains or Himalayas. The predominant source of energy supply is the hydropower sector which is very vulnerable to climate change.

c) Forest and Biodiversity

Forests occupy 39.6 per cent (5,830,360 ha) of total land area in Nepal (MOE 2010). Protection, conservation and use of forest resources are necessary to support the livelihood of ruala people and for sustainable development of environment and biodiversity. From environmental perspective, more forest cover help maintain biodiversity and balance ecology; from agricultural perspective, more land requires to produce enough food for the growing population. The trade-off between these two perspectives is a matter of high level policy decision.

Nepal is rich in biodiversity and ecosystem levels due to the diversity in topography and climate. The diversity ranges from the dense tropical monsoon forest of the Tarai in the North followed by the deciduous coniferous forests of the sub-tropical and temperate Hills to the sub-alpine and alpine pastures and Himalayas in the North.

Biodiversity has become vulnerable to climate change in Nepal because of shifting altitudinal boundaries for plant, the shrinking of plant habitats, plant migration, species loss, forest fire, and extended drought (NPC 2011b).

From the management perspective, some of the prominent problems in the biodiversity sector are high population pressure, rampant poverty, low level of public awareness, and insufficient human resources for climate resilient development in Nepal.

d) Public Health

The impact of climate change on public health heavily occurs mainly in backward communities where there is poor sanitation. Increased flooding contaminates the drinking water causing water-borne diseases, such as diarrhea, cholera and worm infestation. Global warming creates a favorable climate for mosquito breeding that may cause kala-azar, malaria, and dengue fever. The changes in temperature may also be favorable to harmful bacteria and viruses that cause typhoid, encephalitis and hepatitis-B. Thus, the climate change tends to increase morbidity and mortality due to the increased communicable diseases.

e) Urban Settlements and Infrastructure

Almost all the urban settlements in developing countries have been developed in an evolutionary or haphazard rather than a planned process. There are no greenery belts in between industrial zones and in residential area. Most of the urban Infrastructures such as transport, electrification, water supply and sanitation, housing and communication networks are also in sub-standard level in terms of safeguarding them from natural hazards and man-made disasters (NPC 2011b).

Damaged infrastructures hinder the other sectors of development. If the infrastructure of power supply is damaged, for example, ire hinders the industrial production including many other business activities and incurs a huge economic loss. Likewise, the damage of roads impedes the movements of people, good and services. It may also cause vehicle accident,

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the man-made disaster. In some case, the water of drain pipe inters into the pipe of drinking water and then people get sick of water-borne diseases.

Many residential buildings constructed before a decade have no provision of ceiling-fan in Kathmandu. The importance of ceiling-fan and increased height of room are now being realized because of climate change. It seems not sustainable and very costly to reconstruct the building. Thus, the urban settlements and infrastructures must be sustainable and environment-friendly.

f) Climate-Induced Disaster

The remarkable climate-induced disasters in Nepal are floods, landslides and droughts. These disasters threat the security of life and property of the people. Such disasters affect more to the poor and the disadvantaged communities than to well-off urban communities.

In order to protect the life and property from disasters, it is necessary to make disaster management sustainable and environmental-friendly in a planned way. The focus must be given to mobilize technical experts as much as possible to facilitate the local people to make their disaster management plans, programs and activities sustainable.

III. Review of the Climate Change Policy Framework

Nepal has signed the United Nations Framework Convention on Climate Change (UNFCCC) in June 1992 and it came into force in July 1994. The Kyoto Protocol also came into force in December 2005 (MEST, 2008). Nepal has attended almost all Conference of Parties (COP) meetings under the UNFCCC for raising national issues and negotiating the international agreements. Nepal has been internalizing the global agreements by borrowing the global ideas for the formulation of national policy. Whatsoever, the level of internalization may be low due to the complexity and a variety of global agreements. After becoming a party to UNFCCC, Nepal's policy focus directed to environmental protection. Environmental Protection Act 1996 and Environmental Protection Rule 1997 were passed for protecting and controlling environmental pollutions in the country. In order to implement these legal provisions, Government of Nepal (GON) have been setting standards related to industrial waste water and air quality in different points of time. Nepal Vehicle Emission Standard 1999 and National Ambient Air Quality Standard 2003 have been reforming in the line of regional and global standards (MOE, 2011c).

The issue of climate appeared as a national development agenda only when this issue is addressed in Interim Constitution of Nepal 2007 and the Three-Year Interim Plan (2008-2010). The GON prepared a separate paper of "climate Change Policy" only in 2011. The current policy document (MOE, 2011b) realizes present situation, identifies problems and challenges, sets objectives, and states policies and strategies to achieve the goal of improving livelihoods by mitigating and adapting to the adverse impacts of climate change. The broader contents of the policy are adaptation, low carbon development paths and natural resource management. The content of the policy seems congruent with the international agreements such as UNFCCC, Kyoto Protocol, and the different sessions of COP to the UNFCCC. The policy paper also focuses on the effective implementation of the National Adaptation Program of Action (NAPA). The effective implementation of NAPA requires a strong organizational structure.

The Government of Nepal has two chief climate change coordination and policy forums. They are: (i) the Climate Change Council (CCC) formed in July 2009; and (ii) Multi-Stakeholder Climate Change Initiatives Coordination Committee (MCCICC) formed in July 2010. CCC is the high-level policy and coordination body formed under the chairmanship of Prime Minister; and it aims at providing national level policy guidance and long-term directions. MCCICC is the program level coordination body formed under the chairmanship of the Minister of Environment (MOE). It aims at improving communication and coordinating climate change initiatives including adaptation funding. In addition to these chief forums, the GON has also created the Climate Change Management Division (CCMD) under the MOE. CCMD is responsible for coordinating climate change works of the government.

Oxfam (2011a) claimed that the MOE is not capable enough as a focal point and it has no sufficient human and financial resources for implementing the climate change adaptation programs. The National Adaptive Capacity Assessment carried out under the Pilot Program for Climate Resilience (PPCR) in November 2010 highlighted several challenges including insufficient financial, technological and human resources, and the poor institutionalization of risk management in government, academia, civil society or vulnerable sectors, municipalities, and districts or communities (World Bank/ADB/IFC, 2010 cited in Oxfam, 2011a).

IV. Review of Financial Partnership in Climate Change

Because of being a party to UNFCCC, Nepal is eligible to access finance from the Global Environment Facility (GEF) special funds—the Least Developed Countries Fund (LDCF) and Special Climate Change Fund (SCCF). The Adaptation Fund (AF) is also accessible under the Kyoto Protocol. The National Adaptation Program of Action (NAPA) administered by UNDP is funded by LDCF and supported by UNDP, DFID and DANIDA. The Ministry of Environment (MOE)

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leads this program. Ministry of Forest and Soil Conservation (MOFSC) and the Ministry of Agriculture and Cooperatives (MOAC) are also leading for some significant adaptation programs mostly funded by bilateral agencies as well as pooled donor funds (Oxfam, 2011a).

There are several donor-funded climate change programs and capacity-building initiatives in Nepal (see: Oxfam, 2011a). Most of such projects are being implemented by the World Bank and ADB. The Oxfam's report also indicates that, among the bilateral donors, DFID seems a leading donor for climate change financing in Nepal. Oxfam (2011b) introduces ten organizations (mostly INGOs) working in the climate change sector in Nepal. Among them, Warnock International focuses on mitigation, Action Aid Nepal and United Mission to Nepal on Disaster Risk Management (DRM), Care Nepal and Practical Action Nepal on research, and World Wildlife Fund Nepal on multi-sect oral activities. The projects of INGOs in Nepal usually cover a limited geographical area of the Country. The World Bank and ADB are the leading donors for supporting the capacity-building initiatives in Nepal. The technical assistance component is the most critical component of foreign aid in general and also in climate change sector. Oxfam (2011a:14) reports that "… there is a confusing array of separate technical assistance capacity strengthening projects funded by different donors to a number of ministries. These are largely operated by teams of international and national consultants in project implementation units attached to ministries but closely handled by their donors". It indicates the lack of country-ownership of aid activities in Nepal.

V. Findings

The literature on climate change reviewed in this paper indicates some prominent challenges in climate change-related governance capacity in Nepal. They are: (i) lack of technical personnel in public sector; (ii) a week organizational strength and coordination mechanism; (iii) lack of country-ownership of aid activities; (iv) unsustainable donor-funded capacity-building initiatives; (v) insufficient internalization of global policies; and (vi) lack of the institutionalization of climate change governance in different segments of society. This section devotes to identify the degree of the above listed challenges, by using primary data.

Table 1 : Nepal's Climate Change Governance Capacity Assessment

Issues in Climate Change Governance Capacity	Average Response Score (Range= 0 to10)	
	Until 2009	2010 onward
Sufficiency of human resource in public service	4.2	4.6
Organizational strength and coordination mechanism	5.1	5.5
Level of the country-ownership of aid activities	5.4	6.9
Sustainability of donor-funded capacity-building initiatives	4.7	5.0
Level of the internalization of global climate policies	5.1	5.6
Sufficiency of rules, regulations and procedures in:		
a. Policy level	6.3	6.8
b. Front-line bureaucracy	5.9	5.9
c. Academia/ Media	6.6	6.8
d. Civil society	6.4	6.6
e. Community level	4.3	4.6

Source: Field Survey, 2011.

The Table 1 shows the average scores of Nepal's climate change governance capacity in different issues. All the response scores in the Table are very close to the median value (6) of the capacity score. It indicates that Nepal's climate change governance capacity is of moderate level. The Table also shows that most of the corresponding average response scores of '2010 onward' are slightly higher than that of 'until 2009'. It indicates that Nepal's climate change governance capacity is marginally increased from 'until 2009' to '2010 onward'.

In order to measure the climate change vulnerability in Nepal, NAPA (2010) used the combined adaptation capacity by adding the weighted values of socio-economic, technology and infrastructure sub-indices. On the basis of this measurement, the combined adaptation capacity of only 3 districts were of very high level, 5 districts were of high level, 33 districts were of moderate level, 22 districts were of low level, and 12 districts were of very low level. Three districts having a very high level of adaptation capacity were Kathmandu, Kaski and Lalitpur. This fact indicates that the overall adaptation capacity of Nepal was of very close to moderate level.

VI. Conclusion

Nepal is extremely vulnerable to the negative impacts of climate change mainly because of the predominance agricultural occupation in a diverse topography and fragile ecosystems. Rural poverty is the crux of the problem for managing climate change adaptation in Nepal. Because of being an aid

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dependent or a developing country, Nepal's climate change governance capacity is frequently charged of weak organizational structure, insufficient human resources, lack of country-ownership of aid activities, unsustainable donor-funded capacity-building initiatives, and insufficient internalization and institutionalization of global development policies.

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6

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