Climate Change Communication in Nepal

K. C. Anup

1 Climate Change in Nepal

Climate change is a global issue which had occurred from historical past, observed in present time and will be continued in the future due to the change in long term weather phenomena (GoN 2011; Anup and Ghimire 2015). It has a growing concern in Nepal due to its adverse impacts on different sector including agriculture, hydropower and tourism (Sharma 2009). Along with Nepal, other economically poor Least Developed Countries (LDC) are vulnerable to climate change (MoSTE 2015d). Due to its high altitudinal variation, geology, unique ecological system, rugged topography, nature dependent livelihood and poverty, Nepal is highly vulnerable to climate change (FAO 2010; Gurung and Bhandari 2009; Rai and Gurung 2005). It is also intensified by geographical location, social condition, political influence, lack of skilled manpower, illiteracy and economic prosperity (Gurung and Bhandari 2009; Anup et al. 2013).

Nepal has diverse climate, biological resources and agro-climatic zone from subtropical to the alpine and tundra due to the high altitudinal range of 60 m from south to 8848 m in the north from average mean sea level (ADB 2015; Anup 2015). There is occurrence of summer monsoon rain from June to September in Nepal covering about 80% of the annual precipitation (FAO 2010; GWPNepal 2015). Nepal has less than 0.4% of the world's total population and contributes about 0.025% of annual greenhouse gas (GHG) emissions which is very negligible as compared to those of developed countries (MOE 2010; Rai and Gurung 2005).

The temperature of Nepal is rising at a faster rate than the global temperature (Gurung and Bhandari 2009; MoSTE 2015d). There is average annual increase in

K. C. Anup (✉)
Department of Environmental Science, Tribhuvan University, Amrit Campus, Thamel, Kathmandu, Nepal
e-mail: kcanup04@gmail.com

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temperature of 0.06 °C per year with high rise in the Himalayas (FAO 2010; MoSTE 2015b; Rai and Gurung 2005). Temperature projections estimated the rise of 1.4 °C by 2030, 2.8 °C by 2060 and 4.7 °C by 2090 (GWPNepal 2015; NCVST 2009). There are more frequent warmer days and less frequent cooler nights observed throughout Nepal (FAO 2010; Anup 2015). Annual maximum temperature is in increasing trend with hot summer days while minimum temperature is in decreasing trend with cool winter days (Anup and Thapa Parajuli 2014; MoSTE 2015b). Temperature rise is higher in far-western Nepal than other regions (FAO 2010).

Precipitation projections estimated increase in rainfall amount, heavy rainfall events and droughts (GWPNepal 2014a; NCVST 2009). There is decreasing trend of rainfall in central and western Terai while there is increasing trend of rainy days and rainfall amount in western and northern hills and mountains in monsoon season (FAO 2010). High intense rainfall as a result of climate change causes water induced disaster such as floods, landslides and soil erosion (FAO 2010; Anup et al. 2013). Temperature rise is increasing snowmelt and glacier retreat by changing hydrological pattern and increasing glacial lake outburst floods (GLOFs) (ADB 2015; FAO 2010).

Increase in temperature, high intense rainfall, unfavorable weather pattern, rapid snow melt, landslides, floods and glacial lake outburst floods were observed in higher mountains (CCNN 2011; MoSTE 2015b). Climate change had altered ecosystem functions and services, crop production cycles and rainfall patterns; increased flash floods events, longer cycles of droughts and heavy floods events (GWPNepal 2015; MoSTE 2015b). Nepal is fourth most vulnerable among 170 countries according to global Climate Change Vulnerability Index (CCVI) (CCNN 2011; MoSTE 2015b). As, people of Nepal are highly dependent on natural resources and agriculture, slight changes in temperature and rainfall pattern makes people more vulnerable to climate change (GWPNepal 2014a; Rai and Gurung 2005).

Nepal is highly dependent on agriculture contributing more than 30% to gross domestic product (GDP) and supplementing livelihood of more than 80% people (CCNN 2011; MoPE 2004). Dry spells of rain and draughts causes negative impacts on agriculture, livestock, human comfort and livelihood (ADB 2015; FAO 2010). The poor people, who are directly dependent on nature and rain-fed agriculture are unable to cope with this issue (Gurung and Bhandari 2009; GWPNepal 2015). Decrease in frequency of snow fall and snow cover in mountain region affects agriculture, livestock and livelihood of local people (Anup and Ghimire 2015; Anup and Thapa Parajuli 2014). Climate change had caused decrease in ground water level and increase in temperature resulting in low agricultural production (IDE 2015). Rise in temperature increases evapotranspiration rates while change in precipitation increases flash floods, storms and landslides. Climate change can delay, disrupt, damage and bring failure to infrastructure development (MoSTE 2015a).

As climate change had caused adverse impacts on different sectors in Nepal, there is a need of awareness programmes to the affected people about climate

change, its impact, and mitigation and adaptation measures. There is a need of detailed review to assess the situation of climate change communication in Nepal which could be helpful in developing new researches, projects and programmes for effective communication in the future. The activities performed by different organizations towards climate change communication, mitigation and adaptation need to be reviewed for developing effective programmes for climate change awareness in different areas of Nepal.

By setting an objective to assess the role of organizations in climate change communication in Nepal, this paper was prepared through detailed literature review. There were very less peer reviewed journal papers and reports published towards climate change communication in Nepal. The paper was developed without the review of adequate peer reviewed journals. Activities performed by different organization towards climate change were taken from their published annual reports and websites. It was really a challenge to gather adequate information towards status of climate change communication in Nepal.

1.1 Methodology

This paper was prepared through literature review of the researches and publications in climate change issues in Nepal. In the beginning; research reports, annual reports, technical reports and journal papers related to climate change were collected from different websites and libraries. Collected documents were reviewed to assess the role of organizations and researchers in climate change awareness, mitigation and adaptation. Necessary climate change information suitable to the objective of this paper was compiled and prepared in the form of paper. It was observed that different tools and techniques were applied by different organizations for climate change communication, mitigation and adaptation in Nepal.

1.2 Climate Change Communication in Nepal

Climate change communication is necessary to aware local people towards anthropogenic causes of climate change, its impacts and measures to adapt from it. There is an urgent need of collaborative and effective actions in local, national and international level to address its impacts, and enhance climate resilience of the people and country (MoE 2012). Educational programmes and public awareness activities were organized by different organizations using different resources and techniques in Nepal. These organizations had implemented different methodologies for effective climate change communication in Nepal.

1.3 Role of Governmental Sector in Climate Change Communication

There is a great role of government towards climate change communication in Nepal. Government of Nepal is in strong position towards necessary policy formulation process but it is weak in implementation of its policies.

For climate change communication in Nepal, Ministry of Population and Environment (MOPE) guides other ministries and departments (MoPE 2016). It is the main Centre of United Nations Framework Convention on Climate Change (UNFCCC) in Nepal. It has involved its Climate Change Management Division and Environment Division for prioritizing climate change activities (Maharjan 2014; MoSTE 2015e). Nepal had been involved in the climate change regime for over two decades since 1992, and had participated in many climate change intergovernmental meetings (CEN 2012). Multi-stakeholder Climate Change Initiatives Coordination Committee (MCCICC) was formed as a key national forum for regular consultation of climate change policies, plans and projects by replacing Climate Change Network (CCN) (CEN 2012; GoN 2011).

Public awareness programmes were initiated by the government and non-government sector; and these activities were increased with time after 2006 (CCNN 2011; GoN 2011). As being a Party to the Convention, Nepal had prepared and shared Initial National Communication in 2004 (CEN 2012; GoN 2011). Climate change was also prioritized in 2003 Sustainable Development Agenda and 2001 Millennium Development Goals. From 2005 to 2007, Nepal had prepared action plan for enhancing climate change capacity and had implemented projects for managing climate change and the environment (GoN 2011).

Nepal had received funding to prepare Second National Communication (SNC), Pilot Programme for Climate Resilience (PPCR), and Reducing Emissions from Deforestation and Forest Degradation (REDD) readiness activities between 2007 and 2009 (CEN 2012). In July 2009, Climate Change Council was formed as the highest body under the Chairmanship of Prime Minister for policy formulation and international negotiations. Cabinet meeting of GoN was organized near the base camp of the Mount Everest before CoP 15 for climate change communication in national and global level (GoN 2011; Maharjan 2014).

As vulnerability of Nepal towards climate change, climate risks and uncertainties are increasing; new knowledge and capacity towards climate change mitigation and adaptation need to be developed. Government of Nepal (GoN) had initiated different activities to increase institutional capacity of social and economic sectors to enhance resilience of population, and reduce the vulnerability (MoSTE 2015b). Climate Change Policy was developed in 2011 in Nepal to mitigate and adapt to the negative impacts of climate change, focus on low-carbon economy and socio-economic development (MoE 2011). Nepal Climate Change Development Portal was set up as a main platform for sharing climate change information. Nepal Academy of Science and Technology (NAST) had established Nepal Climate Change Knowledge Management Centre (NCCKMC) in partnership with Ministry,

for climate change knowledge generation, collection and dissemination (CCNN 2011).

Pilot Programme for Climate Resilience (PPCR) had started in Nepal along with the National Adaptation Programme of Action (NAPA). It targets in ministerial level for coordination and planning of adaptation in development plans in first phase and implementations of the plans and programmes in the second phase (CCNN 2011). Similarly, GoN had prepared and endorsed National Framework on Local Adaptation Plan for Action (LAPA) in November 2011 according to NAPA priorities with local level participation (Maharjan 2014). LAPA was piloted in Ilam, Udaypur, Nawalparasi, Kapilvastu, Kaski, Dadeldhura, Pyuthan, Rukum, Achham, and Kalikot district of Nepal. During LAPA formulation; public interactions, workshops and seminars for sensitization towards climate change was organized in local and district levels. Agriculture, forestry, health, water and sanitation have been prioritized with special focus on education, local infrastructure, disasters and other environmental sectors (MoE 2011).

Also, local level adaptation projects by non-governmental organizations (NGOs) was taking place in different regions of Nepal (FAO 2010). Nepal had received climate change fund from convention regime, and outside convention from different countries such as; United Kingdom, Japan, European Union, Norway and Germany through different NGOs (Maharjan 2014). Nepal Climate Change Support Programme (NCCSP), Strategic Programme for Climate Resilience (SPCR), and Hariyo Ban Programme were the other important projects being implemented for climate change communication and adaptation to the vulnerable people of Nepal (Maharjan 2014).

There are 7 climate change projects running in response to NAPA and LAPA. MOPE had prepared methodology and guidelines for climate risk screening with the help of 56 Vulnerability Assessments and 56 Adaptation Plans drafts. Vulnerability Assessment and Adaptation Planning Guideline and Risk Management Framework were in the publication process. Ministry of Agriculture Development (MOAD) had implemented National Climate Change Policy 2011 and introduced climate change in National Land Use Policy (2012) and Industrial Policy (2011). Similarly, Department of Soil Conservation and Watershed Management, Department of Roads, Department of Hydrology and Meteorology, Department of Local Infrastructure Development and Agricultural Roads, Department of Water Supply and Sanitation, Ministry of Federal Affairs and Local Development (MOFALD), Department of Water Induced Disaster Prevention, Department of Irrigation, Department of Forestry and Department of Urban Planning and Building Construction had also given emphasis on climate change communication in their planning, policy, project and programme level (MoSTE 2015e).

Other governmental institutions such as Alternative Energy Promotion Center (AEPC) and Reducing Emissions from Deforestation and Forest Degradation (REDD)-Forestry and Climate Change Cell are working towards climate change communication and mitigation (Maharjan 2014; Sharma 2009). MOSTE, MOAD and MOFALD had set up library to collect and provide information related to

climate change in their Climate Change Resource Centre. Trainings and workshops were also organized in regular interval for their technical staff in climate change issues (MoSTE 2015e).

Nepal had signed Paris Agreement along with 174 countries at the United Nations Headquarters in New York to show commitment towards reduction of GHG emissions. To make cities climate resistant, balance and sustainable; ten new towns were proposed in all five development region across mid hill highway area. Cycling was also promoted as a clean transport sector by the government to reduce GHGs emission and increase climate change awareness. Awareness raising programmes on climate change impacts, mitigation and adaptation were conducted by Ministry of Population and Environment in different region of Nepal (MoPE 2016).

Mainstreaming Climate Change Risk Management in Development (MCCRMD) of PPCR had planned to prepare Climate Change Adaptation (CCA) information tool and identify indigenous CCA practices of women and disadvantaged groups. For this, study was carried out to identify indigenous knowledge and local practices; integrate knowledge in policies and plans; and support development works in climate-sensitive sectors in Nepal (MoSTE 2015b). The identified indigenous local knowledge and practices (ILKP) are useful in climate change adaptation and natural resource management in changing environmental scenario. They need to be replicated in different areas of Nepal with the help of institutions of female and disadvantaged groups (MoSTE 2015b). With an objective to enhance governmental body's capacity and share information about climate change, its impact and climatic risk management; a project was run jointly by GoN and Asian Development Bank (ADB). It had expectation to increase climate change resilience in Nepal; and help in developing guidelines, framework, policies, projects and programmes for infrastructure development (ICEM 2015).

2 Role of Non-governmental Sector in Climate Change Communication

Different non-governmental organizations were involved in climate change awareness, mitigation and adaptation in Nepal. To receive climate change fund, most of the organizations were prioritizing climate change as their major agenda. They were focusing in their respective project area but were unable to reach every corner of the country for climate change communication.

First of all, English language is necessary to be translated into Nepali for proper dissemination in schools, colleges, government offices and libraries. Information related to climate change issues was distributed in the form of pamphlets and booklets, and message was circulated through radio and televisions media on special occasions. Involvement of local people in plantation, cleanliness, workshops and seminars on climate change issues was promoted by different local governmental and non-governmental organizations (MoPE 2004). To generate climate

change awareness and help in climate change mitigation and adaptation; climate change vulnerability impact analysis was carried out. Jugedi Khola watershed in Chitwan district of Central Nepal was selected for the implementation of the project on the basis of severity and vulnerability to climate-induced disasters and priority of District Development Committee (DDC) (Gurung and Bhandari 2009).

Clean Energy Nepal (CEN) had prepared an attractive flipchart on the topic, "Climate change, its impacts and solutions" to raise climate change awareness among students and teachers in the school, and youth and elderly people in the community. It was prepared to enhance climate change discussion in a group with the support of OXFAM-Nepal. The flip chart was prepared to assist the climate change mobilisers in the field where there is no electricity and multimedia. It contains information on weather, climate, greenhouse gases, global warming, climate change, impacts of climate change in Nepal, mitigation measures, adaptation measures and international attempts for mitigation of GHG emissions (Acharya et al. 2011).

With an aim to identify local adaptation measures, its opportunities, constraints and innovative ways of enhancing adaptive capacity in Nepal, Regmi and Bhandari (2013) carried out a research with the help of literature review and case studies. Content analysis focusing on climate change responses of two national documents, NAPA and SPCR was carried out. Also, 17 policy makers and 26 practitioners working on climate change issues at the national and local level were purposively selected for semi structured interview. The case study was carried out in two pilot Village Development Committees (VDCs) of LAPA and Community Adaptation Planning (CAP) implementation of Pyuthan district.

Semi structured interview was carried randomly in 120 households of 2 VDCs (60 members from each VDC), and six focus group discussions was carried on the basis of gender and ethnicity with Community Forestry User Group (CFUG) members, executive members of Village Forest Coordination Committee (VFCC), project staffs and local government officials. To assess the risk of climate change and capacity to adapt to climate change impacts, technical assistance was provided by ADB. National and local consultations on issues identified and prioritized by NAPA was proposed with local people, NGOs, government, academic institutions and development partners (ADB 2015).

Eight districts were selected for integrating climate change risk management on water supply and sanitation, roads and urban development, and irrigation and flood protection. For each infrastructure in every district, vulnerability assessment and adaptation planning was carried out to train government officials. Priority was given towards research, training and educational activities to enhance awareness on climate change of university and school level teachers, students, researchers, planners and local governmental staffs (ADB 2015).

To assess different indigenous practices and its role in climate change adaptation, primary data and information was collected from key informant interview and household survey while secondary information was collected through review of literatures, national and district level stakeholder workshops and focus group discussions (FGDs). It was observed that local indigenous people who have less access

to drinking water and irrigation, who lacks social security, and whose livelihoods depend on rain fed agriculture and wage labor were affected adversely by climate change (MoSTE 2015c).

To enhance climate smart agriculture (CSA), Local Initiatives for Biodiversity Research and Development (LI-BIRD) started a research project in partnership with the Climate and Development Knowledge Network (CDKN). The project aims to identify and recommend climate smart technology for different agro-ecological regions of Nepal and enhance capacity of governmental staffs, women and poor farmers for implementation of climate smart village approach. Research to initiate climate smart villages (CSV) was started in 7 Terai districts and mid hill districts to combine weather, climate, water, nutrients, knowledge and carbon smart farming technologies. They have prepared 9 LAPAs in Dailekh, Jajarkot and Jumla district with the support of second phase of NCCSP. Climate Diary was established in Kaski and Parbat district to document daily temperature, rainfall, extreme natural events and important socio economic events (LI-BIRD 2016).

Jalsrot Vikas Sansthan (JVS)/Global Water Partnership (GWP) Nepal had collected information on indigenous technologies and practices related to climate change adaptation measures being applied by Nepalese farmers in agriculture. Indigenous practices were adopted by local farmers to adapt towards changing climatic condition which need to be modified with new technologies. Farmers have traditionally protected seed and seedbed, harvested water, used organic manure, modified cropping pattern, used flood resistant and drought resistant techniques, re-sowed rice seeds and used common nursery for the preparation of rice seedbed to cope with climate change (GWPNepal 2014b).

International Development Enterprises (iDE), Rupantaran and Resource Identification and Management Society Nepal (RIMS-Nepal) are running Initiative for Climate Change Adaptation (ICCA) project to develop climate change adaptation policies and improve food security of farmers. They had focused on changing crop pattern and encouraging use of biogas and solar energy. They had a plan to diversify and improve resilience of poor and vulnerable communities through income generation, enterprise development, sustainable management of non-timber forest products (NTFPs) and production of high-value vegetable crops, coffee, and essential oils. The project plans to enhance capacity of local governmental bodies towards climate change, and develop and implement local adaptation plans. It had helped to aware community members on climate change and alternative livelihood options. To provide information on climate change and alternative farming techniques, it had established Community Climate Resource Centres and community libraries. It had helped farmers to adapt to climate change through water storage, ground water recharge, soil erosion prevention, community-managed multiple water use systems, micro-irrigation, integrated pest management and nursery bed raising (IDE 2015).

World Wide Fund for Nature (WWF) Nepal plans to implement adaptation and mitigation strategies to build the climate change resilience of vulnerable ecosystems and communities by focusing on energy and food security. It aims to promote knowledge of climate change through research studies; campaigns to strengthen

policy and awareness; and adaptation projects to build resilience of local communities and ecosystems. It will train and work with local scientists to understand climate change issues (WWFNepal 2016). In the past, WWF Nepal had helped in increasing awareness on climate change impacts, identifying vulnerabilities, implementing adaptation measures, supporting climate change negotiation, raising climate change awareness and promoting low carbon development in Nepal (WWFNepal 2013).

WWF Nepal had provided technical inputs in drafting Emissions Reduction Project Document (ERPD) in the Terai Arc Landscape (TAL) of Nepal. It had helped in installing 7500 biogas plants in 2012 and 1911 biogas plants in Phase-II Gold Standard Biogas Program (2013–2020) in Nepal's TAL. Implementation of community and local adaptation plan by WWF Nepal had helped 1200 households in TAL, Sacred Himalayan Landscape (SHL) and Chitwan Annapurna Landscape (CHAL). It had provided improved access of water to 4000 households in Indrawati and Dudhkoshi sub-basins. It had organized earth hour event in World Heritage Site to aware many thousand youth towards climate change in Nepal (WWFNepal 2015).

WWF Nepal initiated a project to address climate change vulnerability in the Churia range under Global Environment Facility (GEF) (WWFNepal 2014). It had applied integrated approach to combine food, water and energy security to adapt from the impacts of climate change. A local level learning workshop was organized in Langtang National Park Buffer Zone in SHL to provide awareness related to climate change, its impacts and adaptation measures. It had contributed in forest carbon inventory in the TAL and supported government to draft the ERPIN. WWF Nepal conducted vulnerability assessments (VA) in seven sites (3 in TAL and 4 in SHL) and in CHAL to identify necessary adaptation actions. VA supports preparation of CAPA. WWF Nepal is supporting to enhance capacity of 333 local resource persons and youth in forest carbon inventory and REDD+ issues in TAL, SHL and CHAL. WWF Nepal focuses on water smart communities in rainwater harvesting, runoff water collection and spring source conservation (WWFNepal 2013).

Practical Action had supported in climate change adaptation, climate change policy formulation, low carbon growth and low cost technology with the help of its 16 projects. With the support of community, it had installed a meteorological station in Chitwan and had organized trainings, workshops and exposure tours for climate change communication (PracticalAction 2016). To address climate change issue, Practical Action in collaboration with WWF, IUCN, CECI and NAVIN had developed tools and methodologies of vulnerability assessment for DDCs and VDCs. It had helped in generating wind and solar hybrid energy for lighting, television and mobile charging in Nawalparasi district (PracticalAction 2011).

Action Aid Nepal had organized climate change consultations, promoted Climate Resilient sustainable Agriculture (CRsA) and helped in collective farming, organic farming and community seed bank as a response to climate change. It had translated CRsA handbook in Nepali language with examples of Nepalese farmers and Nepalese agriculture to help Nepalese farmers (ActionAidNepal 2014).

Clean Energy Nepal (CEN) had regularly conducted researches, conferences, workshops, seminars, roundtable discussions and awareness activities related to climate change issues in local, national and international level. It had helped in the formation of Nepalese Youth for Climate Action network, NGO Network on climate change (NGONCC), Climate Action Network and Clean Air Network Nepal for awareness raising, knowledge generation, technology transfer and policy advocacy in climate change issues. It had organized training camp on climate change awareness to equip journalist with climate change skills in print, audio and visual media. It had been regularly organizing green discussion series and pre COP and post COP consultations to communicate international climate change negotiations to policy makers, researchers and students. Before COP 19, CEN had prepared a resource kit for Nepali negotiators to provide information on UNFCCC conferences and meetings procedures, history of UNFCCC negotiations and decisions of previous negotiations (CEN 2014).

International Centre for Integrated Mountain Development (ICIMOD) had helped in setting climate smart technologies to increase climate resilience of rural communities. Atmosphere Initiative had been conducting regular research on black carbon and other pollutants. Climate change exhibition held in Kathmandu and Pokhara had gathered more than 90,000 visitors in a year. Also, few researches were conducted in snow hydrology, carbon stock assessment and other climate change perceptional studies (ICIMOD 2015). ICIMOD also conduct seminars, workshops, trainings and youth forums in regular interval for climate change communication.

NAST-NCCKMC had organized climate change awareness programmes in schools and DDCs of Terhathum, Sankhuwasabha and Dhankuta in eastern Nepal; Salyan, Rolpa, Surkhet and Pyuthan in mid-western Nepal; and Parsa in central Nepal. It had organized quiz and exhibition with the help of colorful posters in simple Nepali language. It had provided information on climate change science, impacts, and adaptation and mitigation measures to students and local people. Also NAST-NCCKMC had provided climate research grant to 25 young researchers in 2012 and climate experts in 2014, and had set up mobile climate change library in different places of Nepal (NAST-NCCKMC 2016).

National Trust for Nature Conservation (NTNC) organizes climate change sensitization workshops, ecotourism promotional activities, awareness generation programmes, and renewable energy support programmes in its Annapurna Conservation Area Project, Gaurishankar Conservation Area Project, Manaslu Conservation Area Project, Central Zoo, Biodiversity Conservation Centre, Bardia Conservation Program and Shuklaphanta Conservation Program in regular interval (NTNC 2015).

Central Department of Environmental Science (CDES) of Tribhuvan University (TU) is one of the pioneer educational institutions actively involved in climate change communication in Nepal. It had organized climate change related guest lectures and seminars in regular interval to its faculties and students. With the support of United Nation Development Programmes (UNDP)-Nepal; it had completed two projects, Ecosystem based Adaptation (EbA) Project and Strengthening Disaster Risk Management in Academia (SDRMA) Project. Recently, TU-CDES had organized awareness related programmes on climate change and disaster

management in different region of Nepal with the support of these projects. It had organized seminars, workshops, round table discussions, trainings and policy consultations in Gorkha, Dhading, Panchase, Pokhara, Kushma, Syangja and Kathmandu. It had also encouraged students to conduct climate change researches in Panchase and other region of Nepal (TU-CDES 2015).

3 Challenges of Climate Change Communication in Nepal

There is a great challenge for climate change communication in Nepal due to its geographical variation, illiteracy, poverty, diverse language, and diverse culture and traditions (MoPE 2004). There is slight increase in climate change awareness of government and non-governmental organizations while public awareness is really a challenge, till the date (CCNN 2011). Women are more vulnerable to climate change than men due to their traditional roles in collection of water, firewood, fodder and other natural resources, and their contribution in agriculture and livestock management (ADB 2015; CCNN 2011). There is strong capacity of Government in formation of climate change policies and strategies while there is weak capacity in implementation of such policies and strategies (ADB 2015). Climate Change Policy (2011) of Nepal had focused less on adaptation and more towards low emission and low carbon development but Government of Nepal had developed NAPA and LAPA framework prioritizing adaptation according to the donor interests (Regmi and Bhandari 2013). Climate financing is difficult to track due to the lack of auditing and financial management system, different criteria of expenses and different sources of climate finance (Maharjan 2014).

Financial, technical and logistic support for climate change communication is not available equally in all the region of Nepal. If it is available in few areas, it is not sufficient for awareness of all the people. There is lack of local skilled manpower for climate change awareness who can implement climate change communication project in local language and in local context by using local resource. Climate change visiting expert would be less effective to spread awareness in village area on climate change issues due to the language problem. Also, geographical variation is disturbing to implement climate change communication projects in efficient way. Lack of transportation and communication facilities is also affecting communication of climate change from print, electronic and digital media.

3.1 Opportunities of Climate Change Communication in Nepal

There is need of strong communication and cooperation among least developed and mountainous countries to raise common problems and initiate common efforts

related to global climate change and development issue. Research, sharing of traditional knowledge, information dissemination, public awareness, infrastructural development, institutional development and effective science-policy interface is necessary for increasing resilience of water, biodiversity, energy, food, natural resources and environment (Gurung and Bhandari 2009; MoE 2012). Poverty reduction, employment generation, economic growth, rural development, environmental conservation, gender equality, social inclusion and sustainable mountain development need to be prioritized (MoE 2012; MoPE 2004). Collaboration of government, community based organization, private sector, local people, civil society and youth need to be enhanced (FAO 2010; MoE 2012). It is necessary to focus on climate induced disaster risk reduction, preparation of climate resilient community, and diversification of livelihood options of local people (Gurung and Bhandari 2009).

As climate financing is a major challenge, 80% of climate change funds should be mobilized for climate change adaptation and mitigation in local level (Maharjan 2014). Food insecurity and food shortage issues in hill and mountain region of mid and far western Nepal should be addressed to minimize immediate hunger (FAO 2010). To minimize the adverse impact of climate change; government and local farmers should adopt micro-irrigation systems, diversify the livelihood options, and change the cropping pattern with respect to changing climatic scenario (IDE 2015). Line agencies and policy makers should identify and plan climatic scenario, hazard, disaster risk reduction approach, land use planning, watershed management, glacial and fluvial movement, ecosystem management, early warning system and agricultural development (FAO 2010).

Technological cooperation and indigenous practices among countries could help vulnerable household to better adapt to climate change (MoE 2012; Regmi and Bhandari 2013). Participation of local people in sharing their indigenous knowledge and capacity building programmes is important in enhancing climate change resilience and adaptation in natural resource management. As, indigenous practices do not receive due attention by government and development agencies, it needs to be incorporated in natural resource management system to promote ownership and sustainability (MoSTE 2015c).

For effective implementation of climate change communication projects, local skilled manpower should be given priority. Necessary trainings and skill development activities of the local manpower should be focused for increasing their level of understanding. Local manpower would effectively implement climate change communication and adaptation projects in his local language and local context by using local resources. Climate change mitigation and adaptation projects are possible to implement if there is sufficient information about climate change science, its impacts, and mitigation and adaptation measures. So, climate change communication programmes are most important in the beginning of project implementation. Sufficient financial, technical and logistic resources should be allocated for climate change communication.

4 Conclusions

Climate change is observed in Nepal in the form of rise in temperature; increase in rainfall amount, intensity and dry spells; unfavorable weather pattern; rapid snow melt; and increased occurrence of landslides and floods. It is one of vulnerable country in the world due to its high altitudinal variation, geology, unique ecological system, rugged topography, nature dependent livelihood and poverty. With an aim to assess the status of climate change communication in Nepal, this paper was prepared through literature review of research reports, annual reports, technical reports and journal papers related to climate change. It was observed that educational programmes and public awareness activities were conducted for climate change communication in Nepal. In governmental sector, Ministry of Population and Environment (MOPE) is leading climate change communication with the support of other ministries and departments. Adequate policies and legislative documents were prepared from government sector but they lack proper implementation. Different non-governmental organizations, community based organizations and academic institutions were helping towards climate change communication in Nepal. It makes a feeling that most of the organizations are prioritizing climate change as a main agenda in their respective project area but were unable to reach every corner of the country. There is a great challenge for climate change communication in Nepal due to its geographical variation, illiteracy, poverty, diverse language, and diverse culture and traditions. Researches, sharing of traditional knowledge, information dissemination, public awareness, infrastructural development, institutional development and effective science-policy interface are necessary for increasing climate change communication in Nepal.

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