# CLIMATE CHANGE AND INDIGENOUS PEOPLES

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Editors

**Krishna B. Bhattachan, PhD**
**Pasang Sherpa, PhD**
**Pasang Dolma Sherpa**

Language Editor

**Eric Saczuk, PhD**



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# INTRODUCTION

# Introduction

Krishna B. Bhattachan, PhD, Pasang Sherpa, PhD, Pasang Dolma Sherpa

## Background

The problem of climate change is a relatively new pressing global concern. Efforts for mitigation and adaptation from its effects are drawing attention of all. Although indigenous peoples are not responsible for the causes of climate change, they are the ones who are at the forefront of its adverse impacts, especially in their sustainable management of natural resources and livelihood. The international research findings have already revealed that the remaining forests in the world are found in the territories and lands of indigenous peoples because of their customary practices and indigenous knowledge. Scientists have now come up with their strong recommendations that until and unless we protect indigenous peoples' knowledge and customary practices for sustainable management of forest and biodiversity, addressing the impacts of climate change is not possible.

There is a need for a wider dissemination of customary laws and practices and their role in sustainable land, forest and natural resource management for the direct benefit of indigenous leaders, policy makers, academics, and researchers. Also, there is need to create awareness about the importance of adaptation and mitigation of climate change in order to formulate climate change-related policies and programs accordingly and effectively.

## Global climate change

"Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have become warmer, the amounts of snow and ice have diminished, sea level has risen and the concentrations of greenhouse gases have increased" (IPCC, 2013). This is the present scenario of the

impact of climate change, and it has been the focus of the world to address it before it further invites natural calamities due to climate change.

Today the concerns of climate change have been a global agenda because of the possible global natural disaster and misbalance in the environment and human existence. This has been one of the reasons why The First World Climate Conference (1979) identified climate change as an urgent world problem and issued a declaration calling on governments to anticipate and guard against potential climate hazards. Since then, A World Climate Program was set up, followed by World Metrological Organizations (WMO), the United Nations Environment Program (UNEP), the International Council of Scientific Union (ICSU) and several intergovernmental conferences on climate change. In 1988, WMO and UNEP established the Intergovernmental Panel on Climate Change (IPCC) to assess the magnitude and timing of changes, estimate their impacts and present strategies for how to respond to the impact of climate change. In 1990, IPCC published the First Assessment Report on the state of the global climate, which has been basis for negotiations under the United Nations General Assembly on a Climate Change convention beginning in the late 1990s (UNFCCC, 2006). To bring a sustainable solution for the impact of climate change, the United Nation General Assembly launched negotiations on an international climate change convention in 1990, thus the United Nation Framework Convention on Climate Change (UNFCCC) was adopted and opened for signature in 1992 and entered into force in 1994. For the first time in 1995, the Conference of the Parties (COP) 1 of UNFCCC was held in Berlin, Germany with the Berlin Mandate. Since 1995, the COP has been held annually. The most recent COP 19 was held in Warsaw, Poland in 2013.

The IPCC (2007) report presents evidence drawn from all continents that shows increasing regional climate change. Global warming is causing changes that will likely increase exponentially if no significant shifts in policy take place. During COP 13 in Bali, Indonesia held in 2007, the issues and concerns of indigenous peoples was brought to the table for the first time when the agreement for mitigating impacts of climate change through Reducing Emission from Deforestation and Forest Degradation (REDD) was concluded. Since then, the International Indigenous Peoples Forum on Climate Change (IIPFCC) has been more active in following the negotiations of UNFCC to ensure and recognize the role and contribution

of indigenous peoples for sustainable forest management and biodiversity. However, the outcome of the negotiations has been criticized for not taking seriously the issues of climate change and its possible devastation on the lives of indigenous peoples especially for developing countries like Nepal.

## Initiatives of Nepal in addressing the issues of climate change

Nepal has experienced an average maximum annual temperature increase of 0.06 degrees centigrade, which is higher in comparison to the global average temperature (0.02 degrees centigrade). This rate of increase is higher in the mountains than in other regions of Nepal because of the snow cover, where the impact of the rising temperature is higher. Despite having only 0.4 percent of the total global population and being responsible for only 0.025 percent of the total GHG emissions in the world (GoN, 2011), Nepal has been affected disproportionately, especially due to the increasing atmospheric temperature.

Nepal became a party to the UNFCCC in 1992 and came into force in December 2005. Nepal has been selected to chair the 48 Least Developed Countries (LDCs) Coordination Group for two years starting in 2013. As chair of LDCs, Nepal has been advocating and lobbying on behalf of developing countries during the negotiations on climate change (Climate Change Network Nepal, 2011). In the process of negotiation and implementation of the adopted agenda of the climate change convention, Nepal has also started initiating discussions on the issues of climate change since 2004, when Nepal prepared the initial National Communication. Between 1996 and 2006, the Ministry of Environment was designated as a focal point to implement the provisions of the UNFCCC. Between 2007 and 2008, Nepal started implementing the Convention by preparing the action plan related to capacity building under the National Capacity Needs Self-Assessment Projects, issued Clean Development Mechanism (CDM) project-approval processes, started preparing the National Adaptation Program of Action (NAPA), started preparing the Second National Communication (SNC), and implemented a project on strengthening the capacity for managing climate change and the environment. In 2010 the Government of Nepal established the Climate Change Management Division (GoN, 2011).

In 2011, Nepal developed the Climate Change Policy. "The main goal of this policy is to improve livelihoods by mitigating and adapting to

the adverse impacts of climate change, adopting a low-carbon emissions socio-economic development path and supporting and collaborating in the spirit of the country's commitments to national and international agreements related to climate change" (GoN, 2011). The strategy and working policy of the Climate Change Policy of Nepal is based on the availability of at least 80% of the total fund for climate change-related programs at a community level. This shows that the Government of Nepal is committed to addressing the issues of climate change from a grass-roots level. However, how the following concerns and demands of Nepal's indigenous peoples are going to be addressed by the climate change adaptation and mitigation policy formulation and implementation by the Nepal Government still lacks clarity.

## Nepal's indigenous peoples' concerns and demands

In 2002, Nepal Government has legally recognized 59 indigenous groups. Since the majority of indigenous peoples in Nepal are still dependent on forests for their livelihoods and have a symbiotic relation with the forest and natural resources, sustainable management of forest and biodiversity is pertinent for securing their distinct identity and customary practices and their ability to pass this on to their future generations. Nepal is the fourth most vulnerable country to the impacts of climate change which have more severely affected indigenous peoples and communities dependent on forests. Therefore, it is very important for indigenous peoples understand the dynamics of climate change and engage in the formulation of policies and programs to address the impacts of climate change for better environmental sustainability and development.

Nepal has ratified many international conventions, including ILO Convention No. 169, Convention on Biological Diversity (CBD), and adopted UNDRIP in 2007, which has clearly guaranteed indigenous peoples' rights, especially the rights to self-determination, autonomy, self-rule, Free, Prior and Informed Consent (FPIC), land, territories, resources and forest management, customary laws and institutions, along with full and effective participation at all levels. To ensure these rights in the constitution, laws, rules and regulation, policies, plans, programs, strategies and activities, indigenous peoples of Nepal have been raising their concerns and demands through indigenous peoples' organizations (IPOs). In this regard, the Nepal Federation of indigenous Nationalities (NEFIN), an umbrella organization for all indigenous peoples, alongside

the National Indigenous Women's Federation (NIWF), an umbrella organization or all indigenous women, have been actively lobbying with concerned Government agencies and other relevant bi-lateral and multi-lateral organizations at both national and international levels.

### Shifting from existing forest or carbon and whole economy centered paradigm to forest and indigenous peoples centered paradigm

Concerning climate change in general and REDD+ and forest related activities in particular, the global actors', mainly the World Bank's FCPF, UN-REDD's, and the States' working paradigm (including policies, decisions and practices), put forest and carbon at the center and relate it with the whole economy. Such a paradigm, unfortunately, undermines indigenous peoples' collective rights, including the rights to their territories, ancestral lands, traditional livelihood, customary practices, language, culture and indigenous knowledge. Therefore there is a need to make a paradigm shift, at both national and international levels, by putting indigenous peoples' rights at the center.

### Shifting from Free, Prior, and Informed Consultation paradigm to Free, Prior, and Informed Consent paradigm

The World Bank's, the States' and other's current policies and practices of free, prior and informed consultation do not hold the international standards of human rights adopted in UNDRIP, and do not contribute positively to the forest and climate. The key global actors, including the World Bank, say 'FPIC' and indigenous peoples say 'FPIC', but the global actors' 'FPIC' is 'Free, prior and Informed Consultation', whereas indigenous peoples are strongly for 'FPIC' meaning 'Free, Prior and Informed Consent' in its letter and spirit. Therefore, indigenous peoples urge the global and state actors to shift the paradigm of 'Free, Prior and Informed Consultation' to 'Free, Prior and Informed Consent' and establish its effective mechanism.

### Establishing mechanisms for a full, effective and meaningful participation in the decision making process at all levels

At the World Bank, indigenous peoples' full, effective and meaningful participation in the decision making process is yet to be achieved.

Indigenous peoples have rights to collective identity, collective ownership and control over ancestral land, territories, forest and other natural

resources, language, indigenous knowledge, and customary practices. However, these rights are not fully cooperated by relevant policies and programs both at global and national levels.

### Giving highest priority to traditional livelihood of indigenous peoples

Indigenous peoples have close relationships with their territories, ancestral lands, forest and other natural resources. Climate change impacts indigenous peoples disproportionately and severely. The global actors, including the World Bank and UN-REDD, need to be fully sensitive to indigenous peoples' traditional forest management practices and encourage the national bodies to review and amend existing discriminatory laws and regulations, policies and programs that ignore the close relationship of indigenous peoples with forests and natural resources. Special attention must be given to securing indigenous peoples' tenure rights to forest, lands and other natural resources, and customary laws and practices.

### Equitable benefit sharing

Equitable benefit sharing arrangements and schemes must be ensured (i.e. carbon rights, access to livelihood resources and meeting basic socio-economic needs and interests of indigenous peoples)

### Indigenous peoples as distinct peoples

Both the global and state actors fail to recognize indigenous peoples as distinct communities; instead, they treat them as local communities. Also, they fail to recognize indigenous peoples' organizations (IPOs) as distinct organizations; they are treated as part of the community-based organizations. If the local community happens to be homogenous (i.e. Only indigenous peoples) it does not make any difference. However, in many places in Nepal, indigenous peoples live with non-indigenous peoples, such as Bahun-Chhteri, Dalits, Madhesi, Muslim etc., and the term local communities includes all these categories of people including indigenous peoples, which is indeed problematic as indigenous peoples are distinct peoples.

### Indigenous Peoples as owners of forest

Indigenous peoples are the real owners of the forest as their way of life is very much married to the forest. Both the global and state actors may or may not be committed to the rights of indigenous peoples' but their

policies, laws, rules and regulations, plans, programs and activities turn indigenous peoples into environmental refugees, and this must be stopped.

### Recognize customary laws and institutions

Both the global and local actors must recognize the customary laws and institutions of indigenous peoples in all activities related to addressing problems of climate change. National laws and national and local institutions are discriminatory against indigenous peoples.

### Good faith

Both the global and state actors must implement their climate change programs and activities with good faith.

### Indigenous peoples as right holders

In all climate change and indigenous peoples-related programs, indigenous peoples are the rightful owners. In practice, however, indigenous peoples are treated as merely stake holders, effectively denying indigenous peoples their rights.

### Effective implementation of UNDRIP and ILO Convention No. 169

Climate change programs should be made compatible with UNDRIP, ILO Convention no. 169 and 8J of CBD. Principles of UNDRIP should be applied in practice in FCPF and UN-REDD. All efforts on addressing the issues of climate changes initiated and implemented by the states, government and multi- and bi-lateral international organizations affect indigenous peoples directly or indirectly. Hence, effective implementation of UNDRIP and ILO Convention No. 169 is essential to keeping those efforts on the right track. In practice, all international and state actors have failed to address the effects of climate change with UNDRIP and ILO Convention No. 169. Indigenous peoples believe that UNDRIP/FPIC should marry UN-REDD and FCPF.

### Overview of the articles of the book

The nine articles included in this book cover several themes relating to climate change and indigenous peoples, with focus on policies and practices in Nepal. All the articles are reviewed by the experts-University Professors, Policy makers and other professionals. Two articles are about

traditional knowledge, cultural practice, customary laws (Pasang Dolma Sherpa, and Pasang Sherpa), other three are on climate change policies, safeguard measure and global negotiations (Naya Sharma Paudel, Dil Raj Khanal and Tunga Bhadra Rai, Ugan Mananhar), followed by three articles on coping strategies, mitigation and adaptation (Ruedi Maumgartner, Roshani Dangi and Resham B. Dangi and Prem Sagar Chapagain, Deepak K.C and Pawan Kumar Ghimire) and one article on women's roles in addressing the issues of climate change (Yasso Kanti Bhattachan).

### Traditional knowledge, cultural practice, customary laws

Pasang Sherpa, in his article "Indigenous peoples' customary laws and practices in natural resource management", sheds light on the role of customary law and practices of indigenous peoples in the conservation and sustainable management of natural resources. He describes the traditional institution called Mithewa, previously known as Dhawa Shyarpa. Based on his case study and data collected at a community level (i.e. among the Ngisyang indigenous peoples of the Ngisyang Valley in the Manang district), he shows the relationship between indigenous peoples' and natural resources in terms of collective ownership, sustainable management and equitable benefit sharing practices. The main roles played by the customary institution known as Mithewa are maintenance of law and order in the community, conflict management, and continuation of culture, tradition and religious practices relating to natural resources and development.

Pasang Dolma Sherpa's article on "Climate change education concerns: traditional knowledge and cultural practices" explore the existing practices of addressing climate change education concerns through traditional knowledge and cultural practices. This helps to explore alternative solutions to addressing the impacts of climate change for a sustainable environment and development. The methodology used for this study is based on both primary and secondary data collected through literature review, documents review and interviews. This study is important because of three reasons concerning Nepal. First, climate change is a global concern due to rapid changes in global temperature and its impacts on the livelihoods of people. Secondly, although the impacts of climate change are visible both in developed and developing countries, people in developing countries like Nepal are at the front line of being affected by climate change impacts. Thirdly, climate change education has already been identified as a major theme of global discussion under article 6 of the

United Nation Framework Convention on Climate Change (UNFCCC), "Education, Training and Public Awareness". This paper reflects upon the education system that is in practice since 1950 in Nepal and explores the options for addressing climate change concerns through existing traditional knowledge and cultural practices for its sustainable solution.

In this scenario, this paper is significant from three perspectives. First, it summarizes the available knowledge regarding climate change concerns. Secondly, it highlights how indigenous traditional knowledge and cultural practices can be helpful in addressing climate change impacts and transfer of current knowledge to future generations. And finally, it helps the policy makers, planners, researchers, teachers and students adopt the necessary initiatives and support for developing suitable education materials and actions to address the climate change concerns for sustainable environment and development in Nepal.

## Climate change policies, safeguard measure and global negotiations

Naya Sharma Paudel, in his article "Climate change policies and programs", analyzes Nepal Government's climate change policies and programs with focus on its genesis, overall structure, strategies, processes and policy-practice link. He is critical of the Government policies and has raised the issues of indigenous peoples'. However, both the Government policies and Paudel's analysis of these policies are positive to some extent but not sufficient from the indigenous peoples' perspective, as none of them adequately addresses the key concerns and demands of indigenous peoples with regards to climate change. Paudel has aptly noted that "While major areas of inquiry are on the biophysical changes, there is relatively little study on the indigenous and local institutional aspects to understand and respond to such changes. Consequently, a dominant and hegemonic knowledge system seems to be influencing Nepal's Climate Change policies and programs on climate change mitigation and adaptation." He further notes that "climate change policies have also portrayed indigenous and local communities as vulnerable, passive victims and recipients of policies and programs" but "there is poor appreciation of the fact that indigenous and local communities have been closely encountering the diverse environmental changes as they intensively interact with the local, natural environment."

Dil Raj Khanal and Tunga Bhadra Rai, in their article "Safeguard measures in climate change policies of Nepal", discuss climate change related safeguard provisions, safeguard measures in policy frameworks such as National Adaptation Program of Action (NAPA)-2010, Climate Change Policy-2011, National Framework on Local Adaptation Plan for Action (LAPA) 2011, and country safeguards system in REDD+. Dil and Tunga analyze the institutional arrangement and compliance system for REDD+ readiness and implementation in Nepal. They link the given context of climate change mitigation initiations with the issues of safeguards in relation to indigenous peoples. Their conclusion suggests that indigenous peoples are one of the actors of safeguard in REDD+ that commend FPIC as a base line of safeguard measures of climate change mitigation and adaptation intervention in the country. They caution that safeguards have to be put in place in order to address the issues and challenges, and to respect indigenous peoples' culture as a whole, which ultimately fosters justice, social inclusion and cohesion in the country. Dil and Tunga believe that the existing climate change policy, NAPA, LAPA and REDD+ related policies and programs need to be reviewed in order to incorporate safeguard systems in their documents and programs.

Ugan Manandhar, in his article "Climate change—negotiations and solutions", describes how scientists raised the issue of the increase in concentrations of GHG (Greenhouse Gases) in the atmosphere at the UNCED (United Nations Convention on Environment and Development) that gave birth to a new convention—the UNFCCC (United Nations Framework Convention on Climate Change). Based on this, the participating countries negotiated on how to address the stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous interference with the climate system. The Convention was adopted at the United Nations Headquarters, New York on May 9th, 1992. It was open for signature at Rio de Janeiro from June 4th to 14th, 1992, and thereafter at the United Nations Headquarters, New York, from June 20th, 1992 to June 19th, 1993. By that date, the Convention had received 166 signatures. The Convention entered into force on March 21st, 1994, the ninetieth day after the deposit of the fiftieth instrument of ratification, acceptance, approval or accession. Currently, there are 196 Parties (195 States and 1 regional economic integration organization) to the United Nations Framework Convention on Climate Change. With the ratification of the UNFCCC Convention in 1994, the first UNFCCC convention COP 1 (Conference of Parties) began

in 1995 in Berlin, Germany to discuss and negotiate the best solutions in order to deal with the emerging threat of climate change. With nearly two decades of negotiations, and the most recent one (COP 19/CMP 9) ending in Warsaw in 2013, we have yet to see an ambitious deal that legally binds all parties to save the planet from the consequences and effects of climate change. The 21st COP and 11th CMP (Conference of Parties serving as the Meeting of Parties) meeting will take place in Paris, France in 2015. It is expected that the conference will pave the way to addressing the effects of climate change through a legally binding agreement. Development is key for all countries, but with this backdrop, climate change comes now as an overarching threat. To balance the two, different solutions have been sought through the negotiation process under the UNFCCC. Nineteen years have passed since the beginning of discussions about the opportunities, challenges, and solutions regarding a safer climate that is connected to all sectors of development, natural resources, the food, water, energy and heath nexus and climates related natural disasters. However, an ambitious deal is yet to be struck among the participating countries.

## Coping strategies, mitigation and adaptation

Ruedi Baumgartner, in his article "Coping with Floods and Global Warming: The case of Rolwaling valley", argues that as globalization continues to assume many forms, the Sherpas of Rolwaling have had to adjust to the economically rewarding integration of their livelihoods into the web of international trekking and expedition tourism by replacing their system of agropastoral transhumance of the past. He deals with adjustments to another global phenomenon that increasingly affects livelihoods all over the Himalaya Hindu Kush mountain range, namely global warming. With focus on Tsho Rolpa, a glacier lake in the Rolwaling valley, Ruedi explores the interface between local communities and government while investigating the roles of local knowledge and belief systems on the decision processes of communities threatened by glacial lake outburst floods.

Roshani Dangi and Resham B. Dangi, in their article on "Forest Conservation and Managements: An option for Climate Change Mitigation and Adaptation", focus on a need to understand the relationship between climate, $CO_2$ and forests for effective and efficient management of the global climate change issue. Their article presents the correlation between climate and forests and discusses the role of forests in reducing the GHG

emissions. They discuss forest-carbon management approaches relating to sustainable development goals, present the comparison of climate change mitigation and adaptation options, explore various market-based instruments used to reduce GHG emissions, and converse about the carbon markets. They draw attention to various management approaches to protect the forest and mitigate climate change impacts. They believe that one single strategy can achieve all the desired goals. They suggest that policy makers assess the vulnerabilities and create mitigation and adaptation strategies to effectively manage the increasing climate change issue. Such strategies can improve forest management practices with twin goals; mitigate climate change and improve the resilient capacity of forests, which should be planned, designed, and implemented properly.

Prem Sagar Chapagain**,** Deepak K.C. and Pawan Kumar Ghimire in their article **"**Climate Change Induced livelihood Vulnerability Situation in Upper Tamakoshi River Basin, Nepal". Overview the effects of climate change that are increasingly observed in the Himalayas. The study area consists of five Village District Committees (VDCs) namely Marbu, Chankhu, Suri, Khare, and Jhyaku of Dolakha district. Increasing temperature and variability in rainfall patterns have severely affected the existing traditional agropastoral production system. More extreme rainfall events frequently trigger landslides in the study area. Landslides initiated on the steep slopes and along the river banks, including Tsho-Rolpa GLoF, have claimed human lives and damaged the foundation of the livelihood of the people living in the area including agriculture and pastoral lands, livestock, houses and crops. Based on the detailed survey of 25 settlements of the upper Tamakoshi River basin, the livelihood vulnerability situation is calculated based on exposure, sensitivity and adaptive capacity of the people. The authors found that out of 25 settlements, five are highly vulnerable and another six are in the medium vulnerability category, where more than 70 percent of the population is of Janajati and Dalit. This is based on the integrated approach of vulnerability analysis by combining the bio-physical, socio-economic, hydro-metrological, local knowledge and practices together with broader engagement of the communities.

### Women's roles in addressing the issues of climate change

Yasso Kanti Bhattachan, in her article on "Diversity in situation and role of indigenous women in addressing climate change in Nepal", states that "Indigenous peoples of Nepal, including indigenous women, have a role

in addressing it." This article highlights the fact that different categories of indigenous peoples in general, and indigenous women in particular, have differential impacts on climate change and roles in addressing it. This article focuses on the role played by indigenous women in the use of alternatives to fuel wood for cooking and heating, adaptation to or reducing effects of water shortages, and production activities in particular and the environment in general. Brahmanism and patriarchy are identified as the main barriers for worsening the situation of indigenous women. The article clearly shows a need to carry out in-depth research on the role of diverse indigenous women in addressing climate change in Nepal.

These articles provide important insights, both from indigenous and non-indigenous perspectives, of experts working on the issues of climate and indigenous peoples. They clearly indicate that there is an urgent need for more intensive studies on the issues of climate change and indigenous peoples, especially relating to customary laws and practices, in order to better understand the issues and manifest effective solutions. We hope that this book will help generate public debate on issues of climate change and indigenous peoples of Nepal.

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# Traditional Knowledge, Cultural Practice and Customary Laws

## Indigenous Peoples' Customary Laws and Practices in Natural Resource Management: A Case Study of Ngisyang Valley, Manang

**Pasang Sherpa, PhD**

### Introduction

Nepal is home to many indigenous nationalities known as *Aadibasi Janajati*. The government of Nepal has officially recognized 59 indigenous groups in the country (NFDIN, 2002) . According to the National Census 2011, there are 125 different castes/ethnic groups. The total population of indigenous peoples is 9,267,870 which covers 35.6 percent, out of the total national population of 26,494,504. However, out of the 59 indigenous groups, the census has not reported/listed 11 indigenous groups[1] (Dahal, 2014). The indigenous peoples have been living in different geographical regions with a distinct culture, identity and way-of-life in Nepal.

The subsistence nature of the indigenous peoples of Nepal, render them dependent on natural resources, including land, forests, and water. Indigenous peoples also have specific cultural, religious, social, economic, and spiritual, relationships with the natural environment. They have their own traditions, customs, customary laws and practices which govern their conservation and sustainable management of their natural resources.

The concept of *"Custom"* refers to a set of established patterns of interactive behavior among humans, which can be objectively verified in a particular social setting, because these behaviors are adopted in everyday routines (Ørebech, 2005 cited in CIRUM). *"Law"* refers to the principles, rules, rights and obligations that govern social interactions and processes.

History shows that the law has always existed in societies and became progressively more sophisticated in response to the increased complexity of a society. Further historical lessons indicate that law can come into being through different dynamics and can be maintained through various institutions and mechanisms.

"Customary laws" are an established system of ancient rules, which evolved from a way of life and the natural wants of people, the general context of which was a matter of common knowledge, coupled with precedents applied to special cases, which were retained in the memories of the chief and his counselors, their sons and their son's sons, until forgotten, or until they became part of the immemorial rules (Roy, 2005).

Customary law is 'grounded in the operations of the mind that lead people to conceptualize legal rule as normative propositions that are binding and mandatory since they are supported by sanctions' (Ørebech et al., 2005).

According to the above definitions, laws can develop from the bottom up and when this is the case in traditional societies, it is often defined as customary laws. It is a means of organizing social life and can accordingly be seen as a part of culture, which is the collection of various aspects related to social organization within a group. Customary laws come into being as customs evolve over time and become the expected norm of a group.

Customary law systems in different settings evolved as a means to turn common-pool resources like forests into so called 'limited common property'. This implies that the property is commonly owned but not subject to open or unlimited access. Recently, the recognition of the value of such common property rights systems increased after research demonstrated that customary laws in different settings have prevented the overuse of common resources and that customary laws create a delicate balance between animals, humans and nature (Ørebech et al., 2005).

Customary law is administered by indigenous peoples' institutions, and the validity of such laws and their contents, including the related procedures, is generally known about, at least by the older members of the community. Indigenous peoples generally regulate their internal customary legal and social matters, including any reforms to these, in a manner of their choosing, unless expressly barred or otherwise prevented from doing so. Such systems form an integral part of their identity.

Indigenous peoples living in Nepal have a long history of customary laws, practices and institutions such as the *Nawa* system of Sherpa, *Ghapu and Dhebu* system of Dolpo, *Kipat* system of Limbu, *Riti-thiti* system of Magar and *Mirchang* system of Thakali in conservation and sustainable management of natural resources. The *Mithewa* system among Ngisyanwas communities in Manang valley is a particularly remarkable instance, in Nepal as the Ngisyangwas have their own language, culture, tradition and way of life.

They have been practicing customary laws and traditions governing conservation and sustainable management of forests, lands, and pasture lands and they maintain a close relationship with their territories and natural resources, being directly dependent on these resources. They depend on their ecosystem, not only for their livelihoods but also for their cultural and spiritual existence as well.

They have been managing their ecosystem and maintaining its integrity and complexity in a sustainable and culturally appropriate way for centuries. Their customary resource management systems based on their endemic traditional knowledge and skills, have proven to be ecologically sustainable and efficient. For Ngisyanwas, climate change poses threats and dangers to their livelihoods, even though they contribute the least to climate change. They have adapted to changing weather patterns through their indigenous knowledge and practices. Besides the conservation and management of the natural resources, they also exercise their customary practices to maintain peace, prosperity and unity within society.

Previously, the *Dhawa Shyarpa*, an ancient social institution, constituted under social customs, had played a profound role in managing almost every aspect of society including forest, agriculture, and pasture lands. The responsibilities of this ancient institution, however, have been brought up by the Mithewas in recent years. The Dhawa Shyarpa and Mithewa, constituted and appointed under a customary a law in Ngisyang Valley, have been playing an exemplary role in the conservation and sustainable management of their forests, agricultural lands, and pasture lands. Individuals by post and institution by practice (Dhawa Shyarpa and Mithewa) also play remarkable roles in maintaining harmony, unity, and good-governance and undertaking developmental activities in their communities.

Customary laws and practices have been transferred from old to new generations due mainly to the process of socialization developed over many years in the communities of indigenous peoples. In most of the indigenous peoples' communities, they have their own legal, political or council-like traditional institutions, which effectively implement the customary laws.

These customary institutions, even have an important role in conservation and sustainable management of natural resources. The customary laws, practices, and institutions existing among them are found to be developed as part of their community beliefs, values, and norms. The customary institutions formulate their own rules and laws in order to effectively implement customary law and practices. Such rules and laws, implemented by the customary institutions, are instrumental in controlling and guiding the daily activities of local peoples. The breach of such rules and laws by any member of the community is subject to punishment.

Despite these unique, imitable, and sustainable qualities of the customary laws and practices, the existing government laws, acts and policies on forests, have not recognized these indigenous assets exercised by the peoples of Ngisyang Valley.

ILO Convention 169 and the UN Declaration on Rights of Indigenous peoples (UNDRIP) have ensured the indigenous peoples' rights to forest, land, and waters and guaranteed their rights to be able to exercise their customary laws and traditional practices. These international legal instruments also have drawn the attention of national governments to recognize the customary laws and practices of indigenous peoples while implementing national laws.

## Research methodology

This study was carried out in the Ngisyang valley of upper Manang, which is known as the district-beyond-Himalaya. Residents of this valley are called Ngisyangwas in their local and Tibetan language.

A qualitative research design was applied for the purpose of this study. Qualitative information was collected through observation, key informant interviews, and focus group discussions. Key informants and focus group participants were selected by applying the snowball-sampling method. Social workers, political leaders, activists, indigenous peoples' leaders, religious leaders, Mithewas, members of the Mothers Group, school

teachers, and VDC secretaries were selected as key informants and focus group participants.

Qualitative information on occupation, settlement pattern, forest coverage, agricultural land, pasture land, core values and beliefs, governance systems of Ngisyanbas, their interrelationship with the land, forests and other natural resources, the role of customary laws and practices for the conservation and sustainable management of the natural resources were collected through focus group and key informant interview guidelines. The impacts of governments' legislation and policies on land, forest and natural resources over the indigenous peoples' customary practices and the experience and standpoint of the community, are also interpreted and analyzed in a descriptive manner.

## A review of government policies and Legal Recognition of indigenous peoples' customary laws and practices in Nepal

Indigenous peoples, until the territorial unification of Nepal by King Prithvi Narayan Shah in 1769, had their autonomous and independent states with their collective ownership of the land under which they exercised customary practices, developed a political system, and administrative institutions to ensure the conservation and sustainable management of forest, land, and other natural resources with equal access and rights over the resources. However, the post-unification governments of the country, on the pretext of equal distribution of forests, lands and waters, introduced discriminatory acts, policies and regulations on land and forests which, rather than recognizing the indigenous practices, significantly curtailed the customary laws and practices of indigenous peoples. As a result, some of the ancient and very effective practices, traditional knowledge, and skills, including customary laws and traditional institutions became weak with some even going out of practice altogether (Sherpa et al., 2013).

Introduction of the Private Forest Nationalization Act in 1957, nationalized the forests existing in the collective ownership of the indigenous peoples. Implemention of the Pastureland Privatization Act of 1975, the government, similarly, nationalized the land being used by indigenous peoples for their subsistence and provisioned taxation against the use of such lands.

The second amendment of the Land Reform Act in 1964, likewise, became another tool through which the government eradicated the *Kipat System*, a collective land ownership of indigenous peoples. The National Park and

Wildlife Conservation Act of 1972, again, added woes to the wound of the indigenous communities by evicting them from their ancestral homelands.

These acts, thus, seized the indigenous peoples' collective ownership, deprived them of their rights and interrelations with their natural resources and endangered their historical identity and existence all at a same time.

These political moves by almost all the centralized governments, state mechanism, policies, rules and regulations on land, forest and other natural resources introduced after the territorial unification of Nepal, legally and constitutionally deactivated and gradually eliminated the traditional practices and customary laws of the indigenous peoples.

Long after the territorial unification of the country, the Constitution of the Kingdom of Nepal (1990), introduced after the restoration of a multi-party-system in the country, declared Nepal a multiethnic, multilingual, and multicultural nation for the first time in history. However, the Forest Act of 1993 and Forest Regulations of 1995, introduced after the restoration of a multi-party-system, were nothing but discriminatory provisions against the indigenous peoples that transferred ownership of leasehold, community, and religious forests to the government from the indigenous peoples. In this way, the governments of Nepal have, one after another, deprived indigenous peoples of their rights to access and control natural resources needed for their survival.

Despite these discouraging and discriminating laws, acts and policies, the indigenous peoples living in the Mountain Region, have, to some extent, still been able to continue with their unique traditions, customary laws, culture, and practices to make their subsistence and keep their collective identities. As a result, they have made remarkable contributions to the conservation, promotion, and sustainable management of forests, lands, and waters in their areas.

The Interim Constitution of Nepal (2007) declared Nepal a federal democratic republican country and includes attempts to enshrine the demands raised by the indigenous peoples. However, even this constitution, lauded as the most inclusive in Nepals history, does not clearly recognize the indigenous peoples' traditional skills, knowledge, customary laws and practices. Even the acts introduced after the Interim Constitution, contained nothing about the rights to autonomy and self-determination of the indigenous peoples (Sherpa et al., 2011).

Following the second constituent assembly election on 19 November 2013, most Nepalese are hoping to see a new constitution that addresses the demands and enshrines the rights of indigenous peoples.

It is important to underline that the government of Nepal has ratified and signed the various international conventions and treaties that are against the spirit of its previous policies and acts. Signing of the United Nations Convention on Biological Diversity (UNCBD) and the International Labor Organization (ILO) Convention 169 in 2007 and voting for the United Nations declaration on rights of indigenous peoples (UNDRIP) are some of the positive steps in regards to the rights and identity of the indigenous peoples. Yet, the government of Nepal has to realize the necessity to amend or reform its acts, policies and strategies, which are contradictory to the international legal instruments and ensure the rights of indigenous peoples over natural resources and recognize their customary laws and practices.

Article-8 (J) of the CBD provisions governments around the world to honor, protect and preserve the customary laws, skills, knowledge and traditional way-of-life of indigenous peoples. It also states that national governments must recognize, protect, and promote indigenous knowledge, skills, and discoveries related to the conservation and management of biodiversity through their national laws. Article 10-(C) of the UNCBD, likewise, provisions that national governments protect and promote the indigenous peoples' long-standing customs of conservation and sustainable management of biodiversity (IMPECT, 2009).

Article-14.1 of the ILO Convention 169 clearly urges the recognition of ownership rights and possession of the indigenous peoples over the traditional lands which they occupy. It also directs the governments to take measures in appropriate cases to safeguard the rights of the indigenous peoples concerning lands not exclusively occupied by them, but to which they've traditionally had access for their subsistence and cultural activities. Therefore, it is another responsibility of the government to ensure that indigenous peoples have full rights to land, forest and water together with other forms of natural resources.

Articles 8-13 of ILO Convention-169, speak of the customs, customary laws and traditional institutions of the indigenous peoples. According to these provisions, national governments, while introducing and implementing their national laws, acts and regulations, should encompass

the traditions and customary laws of the indigenous peoples and allow them to exercise their customs and traditional institutions which assimilate to the basic human rights of their national laws and have international recognition.

Article-26 of the UNDRIP clearly states that indigenous peoples will have rights over the land, areas or resources that they have traditionally owned, seized or used in some form. Furthermore, UNDRIP supports the rights of indigenous peoples to keep, control, use and develop the land and natural resources that they, somehow, have traditionally owned, occupied, used or obtained. National governments, according to the UNDRIP, must legally recognize and protect the rights of the indigenous peoples over such property.

Article-31 of the UNDRIP provisions the indigenous peoples' rights to uphold, control, protect and develop their cultural heritages, knowledge, cultural expressions, customary science and technologies. Article-34 of the UNDRIP is particularly important as it allows indigenous peoples to possess, promote and develop their prevailing institutional structure, distinct customs, traditions, spirituality even under an existing legal system by assimilating the international standards of human rights (UN, 2008).

As a signatory nation of these international conventions and treaties, it is crucial that the government of Nepal ensures the rights of indigenous peoples over their natural resources and recognizes the existing customary practices for the conservation and sustainable management of natural resources.

## An Overview of the Study Area: Ngisyang Valley of Manang

This study was carried out in the Ngisyang Valley of upper Manang, popularly known as the district-beyond-Himalaya. The district occupies an area of 2,246 sq. km and is located at an elevation of 2,700 to 6,102 meters above mean sea level. The district borders Gorkha to the east, Mustang, and Myagdi to the west, Tibet (China) to the north and Kaski and Lamjung to the south.

Manang is one of the largest districts of Nepal in terms of geographic extent and smallest in term of population. Manang Valley is called Ngisyang valley and the residents are called Ngisyangwas in the local dialect (Rosers, 2004). There are 13 village development committees

(VDCs) in the district and they are known for their rich and distinct cultural, geographical, ecological, and social diversity.

Manang is divided into three different parts according to geographical variations and distinct ways-of-life; the Upper Manang; the Lower Manang; and Nar-Phu. There are seven VDCs[2], as they are called in Ngisyang valley, in the Upper Manang.

Most of the people in Ngisyang Valley do not know the literal meaning of the word Ngisyang. However, it is supposed that Ngisyang is the combination of two words from the local dialect 'Ngi' and 'Syang' wherein 'Ngi' means 'we' and 'Syang' means a 'village', located previously in upper Mustang. When some people from Syang village migrated to the present Ngisyang valley, they adopted Ngisyangwas as their new homeland (Gurung & Neupane, 2012).

Lower Manang, locally called Ghyalsumdo, is divided into four VDCs[3]. In the local dialect, Ghyalsumdo means a meeting-point of three routes or villages. Likewise, the Nar-Phu area of the district is divided into two VDCs named Nar and Phu. Both of the VDCs are located at the northeast part of Ngawal and Pisang Mountains (Manang VDC, 2010/11).

Manang is located at an average altitude of 3,600 meters above mean sea level. The average annual temperature in the valley ranges between 10° C to 15° C, with highs of up to 21° C in summer. Winters can be cold with temperatures falling below -5° C and heavy snowfall (Chapagain, 2008).

According to the 2011 National Census, the population of Manang district is 5,827, comprising of 3,015 males and 2,812 females. Unlike other districts, the population of Manang appears to experience remarkable oscillations from one census to the next. Major factors influencing this is the frequent movement of the Manangi people towards Kathmandu, Pokhara, and other facilitated cities, mainly in search of jobs and by business facilitated by their children's education.

Traditionally, Ngisyangwas have been involved in agriculture, animal husbandry, and trans- border trade. They grow potatoes, wheat, buckwheat and barley (Karu) as the chief crops while mustard, cabbage, cauliflowers, broccolis, carrots, and beans represent the majority of their vegetable production.

People keep animals like yaks, nak (female yak), cows, oxen, horses, sheep,

and goats. They keep yaks as major beasts of burden and the main source of meat while sheep are grown for the dual purpose of meat and wool. Horse, is the main means of transportation. Other animals are kept either for the main purpose of obtaining manure for their farmlands or fulfilling the needs of transport. Animal husbandry and animal sales, likewise, have been a reliable source of family income. As animal husbandry is the major source of earnings and subsistence of the peoples in the valley, every village in the district has maintained its own pasture lands. At present, however, the occupation of animal husbandry is threatened by the lack of human resource as most of the people are shifting to trade.

All the VDCs in Upper Manang have their own forests for the collection of firewood, timber, and medicinal herbs. However, people, as per the customary laws, are only allowed to collect forest products within a specific time and in limited quantity. Pisang VDC has the deepest and largest forest of the entire area. The forest in Pisang is full of chir-pines (Thangsing), cedars (Kelsing), and junipers (Sangsing). Firewood, grass, fallen leaves, and even the timber are collected for household use. For the last five to seven years, the locals have also started collecting cordycep (Yarchaagunbu) from this forest, which has been a significant source of cash earnings for them.

Another important and traditional occupation of the Ngisyangwas is trade. Their trade history is entirely different from the other indigenous peoples and ethnic communities in the country, with a long history of trans-Himalayan trading. The government of Nepal has given the Ngisyangwasi's passports since 1962 with special rights to travel and trade with various countries, including those in South and Southeast Asia. Resultingly, their business activities extend all over South Asia as far as Korea (Gurung, 1976). However, with the cancellation of their special rights to trade and travel in 1976, the people of Ngisyang valley opened their doors to tourism.

The Ngisyang valley, since ancient times, has been an abode for two indigenous communities, Gurungs and Ghales. Stemming from the Gurung and Ghale communities, there are clans such as Tonde, Samwe, Ngarchong, Bhrakalama, Ghurchyakchyak, Kandedu, Kale, Ngimchhiring, Bagting, Kamisatar, Khen, Jimalthoki, Pantilama, and Prop (Gurung & Neupane, 1969). In the local dialect, the term 'Fowe' refers to a clan. As Buddhists from the Mongoloid race, the people in the

Valley speak Ngisyangte language. Ngisyangte largely resembles Tamang language and sounds closer to the languages spoken by the Thakalis in Mustang and the Chhantyals in Myagdi. Despite a law that restricts people from outer communitis to purchase land, the valley, in the recent years, has become home to Tamang, Rai, Magar, Kshetri, and Kami as well. However, most of the new and non-Indigenous peoples are involved in taking care of locals' homes, running small-scale businesses and doing wage-based jobs.

### Dhawa Shyarpa and Mithewa: A traditional customary institution of Ngisyanwas

Since ancient time, there is a distinct traditional customary legal system prevailing in the communities of Ngisyang Valley. Keeping in mind the necessity of managing, maintaining, and promoting their traditional occupations of farming and animal husbandry, the people in the community have developed sustainable customary laws and practices. For centuries, Dhawa Shyarpa has been mainly responsible for the administration and maintainance of almost every aspect of the community, including social, economical, political, and religious activities.

In recent years, however, the responsibility of administering and managing various aspects of the communities in Ngisyang Valley, has been undertaken by the Mithewas. Like Dhawa Shyarpa, the Mithewas have effectively accomplished the responsibilities of conserving, promoting, and managing the forest, agricultural and pasture lands.

Although the majority of people in Ngisyang Valley have practiced the guiding principles of Dhawa Shyarpa custom, no one knows exactly when and how the custom came into practice. Some believe that the tradition came into existence some three hundred years ago in the Manang valley (Gurung, 1977).

Locally, Dhawa Shyarpa is also called Kha-mba Lhen-nji, which means the head or leader of the village. In terms of numbers, there are four Dhawas (Kh-ha-mwas), four Shyarpas (Lhen-nji) and one Katuwal (Choun). The *Choun* is a messenger called *Thopip* in the local dialect.

Dhawa Shyarpa are selected through a democratic process based on their age. According to the customary practice, the first four eldest persons of the village are selected for each of the Dhawas and Shyarpas. To be a Dhawa or Shyarpa, one must be between 18 and 70 years of age. If two

or more persons are of the same age, the community sets uses a lottery system for the selection. As per the ancient practice, the Dhawa Shyarpas commit to a one year term. Following the completion of their tenure, Shyarpas are routinely appointed as Dhawas for the next consecutive year due mainly to the seniority of their age. Those who have once become Dhawas, can be reappointed to the post only when all the family heads in the village complete their tenure.

Dhawa Shyarpa, in Ngisyang Valley, are selected on the customary darting-day or an archery festival, locally called Mitha. The festival occurs in March and April. Dhawa Shyarpa are selected by a proportional representation system on the basis of their clan and total households in the village. There are mainly three clans; Sakrong (Gurung); Puine; and Thate (Katuwal), in Pisang village. Two each from the Sakrong and Puine clans are selected as Dhawa Shyarpa. Since the Thate clan permanently holds the post of Katuwal, no one from this clan is eligible for selection as Dhawa Shyarpa. During the process of selecting Dhawa Shyarpa, each clan holds its own meeting and makes a unanimous selection. Information about the selection is given through the Choun, or messenger. Once the Choun circulates the information regarding selection of the Dhawa Shyarpa, the village people, in order to recognize and congratulate their newly elected representatives, go to their homes and offer jand, a locally made, home-brewed barley and millet beer, and khada, a silk scarf used mainly by Buddhist communities on auspicious occasions.

Dhawa Shyarpa carry out social, cultural, political, legal, and even development works. They play a prominent role in carrying forward the customs, customary laws, village practices, and maintain law, order, peace, and harmony in their community. Moreover, they amend, modify and reform the customary laws and practices and implement them as suitable to contemporary society. They settle disputes and quarrels between villagers and play vital roles in the continuation of religious and cultural activities including the conservation and caretaking of forests, control of illegal hunting and management of pasture and farmlands. Scheduling the time for seasonal transhumance of livestock, they specify when to move the cattle to pasture lands and bring them back to the village.

Similarly, they specify the time and quantity of firewood collection from their forests. The decisions regarding these activities are taken collectively through a joint meeting of Dhawa Shyarpa. Community members, failing

to abide by the decision, are fined a certain amount of money. Those intentionally disobeying the decision are fined double the specified amount. However, community members who disobey the laws more than two times, are fined through a joint meeting of all the clans in the village. Since the locals are generally honest and obediant, rather than appealing the decisions, simply follow the prevailing customary law and practices.

Previously, the Dhawa Shyarpa from Manang were considered superior because they had special powers over all the other Dhawa Shyarpa throughout the district. For example, people dissatisfied with decisions taken by the Dhawa Shyarpa of Ngisyang community would go to the Dhawa Shyapra of Manang and accept their decision as a final verdict. In the past, the Dhawa Shyarpa of Ngisyang Valley would look after the political and administrative activities and facilitate the people from Nar and Phu to settle the disputes (Gurung, 1977).

The once dominant role of Dhawa Shyarpa, now seems to be gradually weakening after the introduction of the party-less Panchyat system in the country in 1960. However, their roles of exercising societal customary laws have recently become stronger again because of the absence of local government representatives. To some degree, the Mithewa, locally known as "great or respected person", has been carrying out the role and responsibilities that had previously been accomplished by the Dhawa Shyarpa.

Many years ago, persons losing the case were made to deliver stone for construction purposes in the village. However, with the increasing use of money, the tradition of a monetary fine has come into existence (Pokharel, 2008).

The structure of Dhawa Shyarpa in Manang village is slightly different from the structure in other communities in the valley. Unlike in other communities, the Dhawa Shyarpa form a nine-member committee comprising of one Falasin, four Kh-hamwas, two M-hitis and two Shyarpas. People of Manang also select their administrative body on the occasion of the Mitha Festival. The festival is celebrated at the end of March and the beginning of April when the snow has melted and people are ready to sow their crops. As per the tradition, all community members over 15 and under 60 years of age must attend the festival. Those failing to attend the festival are subject to punishment. The administrative body

is selected in the presence of the village people. They are subsequently congratulated by the villagers and presented with khada. The following day, the out-going committee hands over its responsibilities to the new members.

Earlier, Kh-hamwas used to make the final verdict in cases unsolved by the Falasin. Thus Kh-hamwas, in a way, used to play the role of judge and adviser. Similarly, M-hiti would disseminate the notices to the villagers and Shyarpas, similar to a modern-day policeman, would arrest the accused and crime suspects. Mithewas who have carryied out the works previously done by the Dhawa Shyarpa are also called Kh-hamwa-Lhen-njin.

### Role of Dhawa Shyarpa and Mithewa in conservation and sustainable natural resource management

For centuries, Ngisyangwas have been conserving, managing and using forests, agricultural land and pasture lands according to the guidance and instruction of Dhawa Shyarpa. The protected forests of the Ngisyang valley are seasonally opened for collection of firewood, timber and fodder. A protected forest, in the local dialect, is called "Teising". All villagers involved in agricultural activities posess their own Teising (Table1).

Table 1: List of protected forests in various villages since ancient time

| VDCs | Name of Forest | Location of Forest |
|---|---|---|
| Pisang | • Mekena<br>• Chyongda<br>• Pinti | • Nearby a village in upper Pisang<br>• Upper part of the Urgen Thoche Chholin Monastry in Upper Pisang<br>• Upper part of the Urgen Thoche Chholin Monastry in Upper Pisang |
| Gyaru | • Hyumafo<br>• Na | • The steep-slope area of the village's upper part<br>• Bottom part of the village |
| Nga-wal | • Chikung (Raniban), Upen, Thakri<br>• Thanggung | • Upper part beyond the village<br>• Lower part of the village |

| | | |
|---|---|---|
| Bhraka | • Mungjina<br>• Jyulana<br>• Chenangche, Kresadche<br>• Frawal, Chinkre | • Around the Sher Monastry in Mungji village and its lower part<br>• Bhraka village and its upper part beyond the Masyangni River |
| Tanki Manang | • Teising | • The steep-slope area of the Tanki Manang's upper part. |
| Khangsar | • Tare Gumba Forest | • Forest around the Tare Monastery |

Source: Field Survey, 2013

Protected forests are comprised of different tree species, namely *Thangsing* (sallo), *Syukpa* (Dhupi)**,** *Khoti* (Bhojpatra) and Khe (kalo sallo)**.** People can collect dry firewood and fallen leaves to make compost. No one is allowed to trim green branches or foliage. However, people can collect timber for the construction of a monastery, school or a bridge, with permission of Mithewas. Unlike others, the Ngisyangwas, are prohibited from collecting firewood and fallen leaves from the Teising forest of Tanki Manang and Chikung forest of Ngawal. Until the Annapurna Conservation Area Project (ACAP) took over control and protection responsibilities of the forest at the recent time, Dhawa Shyarpa of the area used to fine people who would enter into the forest and collect firewood and timber from these forests.

Presently, there is a trend to protect trees on sloped land and around the monastery. The Ngisyangwas seem to be afforesting and protecting plants in order to mitigate the hazards posed by landslides, rock slides, and floods. Recently, they have been realizing the impacts of climate change-related events that have affected their community including floods, landslides, drought, accelerated glacial melt and rising water levels in glacial lakes. The indigenous Ngisyanwas have, for centuries, been adapting to changing weather patterns through their indigenous knowledge and practices. This resilience has helped them to survive and develop appropriate adaptation methods. They play vital roles in enhancing the resilience of the local ecosystem through their traditional knowledge and sustainable management of forests and other natural resources in their area. Protected forests contribute to the ecological and environmental

balance, biodiversity, reduction of climate change impacts and have added beauty to the village area with greenery and perenial flowers.

**Management of farmland, crops and pasture land**

Ngisyangwas still practice transhumance to protect their crops from livestock. As per the custom, the villagers move their livestock from the village starting mid-May. Previously, the date for transhumance was specified by the Dhawa Shyarpa but is now done by the Mithewas. Once the Mithewas set the date to move the livestock, Choun (Katuwal) informs the villagers about the decision.

Every year, following crop cultivation, local people select crop-guards called Chhowa from among the households involved in the farming. Once the crop-guards are selected, they are congratulated and offered khadas by the villagers. The out-going Chhowa formally hands over his responsibility to the new one amid the presence of the villagers. The number of Chhowa differs from one village to another, depending upon the number of households and size of the agricultural land. Some villages enjoy four or five and even seven crop-guards to ensure the protection of their crops. In addition to Chhowas, the people also select three types of herdsmen locally called; Ta Chhen; Ra Chhen; and Me Chhen; two in each category, who move the livestock from the village and look after them in the pasture lands. As per the system, Ta Chhens are destined to look after the horses, Ra Chhens are deployed to look after the goats and sheep while Me Chhens are look after the cows and oxen.

Following the selection, Chhowas hold a meeting to discuss and allocate their responsibilities amongst each other. If an animal, which is not taken to the pasture land even after the scheduled date, destroys crops in the village, Chhowas take control over it and fine its owner. Chhowas are always watchful so as to prevent animals from entering croplands. As per customary laws, no animals are brought back to the village until all the crops have been completely harvested. Once harvesting is over, Mithewas and Chhowas hold a joint meeting and set the date to bring back the livestock. People can collect grass from the grassland for three or four days after the Mithewas specify a date for grass collection. After cultivation, milk-yielding animals and their kids are kept to graze in the nearby pasture lands while the rest of the animals are taken to more distant pasture lands and left free to graze.

If an animal destroys someones crops, its owner is fined depending on the type of animal, quantity of the loss and time spared in crop plantation. Fines imposed against people from another community are comparatively higher than those for people from the local community. Fine amounts vary depending on the village. For example, in Manang village, a horse owner is fined Rs. 10/- to 100/-, cow and ox owner Rs. 5/- to 50/-, goat and sheep owner Rs. 3/- to10/- and a yak owner Rs. 50-100. If an animal destroys crops more than once, the owner is subject to pay a comparatively higher fine. Likewise, if a herd of animals destroys crops, the owner has to pay a fine as assessed and specified by the Mithewas. The amount collected from fines, in some villages, is divided between Mithewas while other villages deposit the amount in a fund allocated to religious activities.

Ngisyangwas have always used horses as the major means of transport. People who travel longer distances can keep their horses tied in an empty or barren part of the village with permission from the Mithewas. Even seriously injured animals can be kept in the village but with Mithewas' permission. As per the customary laws, the most respected persons in the village, specially Mithewa and chief Lama, are allowed to keep a horse in the village, but they have to ensure that their horses do not destroy other villagers' crops.

### Relations between customary institutions and government agencies

As an outlying part of the country, Manang district, in the past, remained deprived of mainstream development afforded to most of the rest of Nepal, for a long time. Until the 1980's, the district hardly even felt the political and administrative presence of the state. Almost an autonomous region, the district was controlled and managed by the Dhawa Shyarpa. It was always the Dhawa Shyarpa who would maintain law and order, promote peace, harmony and culture in the society and conserve and manage forests, farmlands and pasturelands belonging to their community.

Introduction of the partyless Panchayat system in 1960, King Mahendra started developmental activities by establishing Village Panchayats across the country. Influenced highly by their traditional customary laws and practices, the Ngisyangwas did not pay much heed to the activities of the Panchayat. As a result, they continued with their customary Dhawa Shyarpa institution, until 1977 (Cook, 1960, cited in Chapagain, 2008).

Eight years after the introduction of the Panchayat system, King Mahendra visited Upper Manang in 1968. During the visit, the local people approached him with problems related to roads, trade, passports and Khampa Revolt in the district. The King vowed to solve these problems immediately and the locals agreed to follow the Panchayat system. However, the people of Manang formally accepted the Panchayat only after 1977 (Chapagain, 2008). Even after accepting the Panchayat system, the local people continued with their customary laws and practice as Dhawa Shyarpa became the office-bearers of the Village Panchayat.

Even through the Panchayet period, Mithewas' role have been equally dominant even after the restoration of the parliamentarian system in 1990. As the local government bodies are functioning in the absence of people's representative since 2001, the role of the Mithewas has consequently increased. It is they who settle disputes and quarrels among the villagers and play vital roles in continuation of religious and cultural activities, conservation, caretaking of forests, control of illegal hunting and management of pasture and farmlands. Thus, they have made remarkable contributions to the maintenance of a social system in the absence of local government representatives.

Customary laws and practices, as mentioned earlier, have given the appropriate rights to the Mithewas to manage animal husbandry, pasture lands, farming and cultural activities. They have a major role in the formation of necessary committees and selection of the required number of members of such committees. Mithewas, in consultation with Lamas, or religious leader, specify dates for crop cultivation and harvest. They also have roles in protecting and managing local natural resources and monitoring the buying and selling of local land. Likewise, the Mithewas have been effectively implementing the customary laws that forbid the sale of even private land to people from outside the community.

In the recent years, especially after the introduction of the Annapurna Conservation Area Project (ACAP) in 1992, Conservation Area Management Committees (CAMCs) have come into existence in various villages. The conservation of local culture and development of the Annapura area, in coordination and cooperation of the local people, have been carried ahead on the basis of the policy and strategy adopted by the ACAP.

Even after the CAMCs formation, Mithewas are invited to participate in the process of committee formations and decision-making processes. However, according to the Mithewas, they, are not invited into the processes of decision implemention and monitoring other than the exceptional case of dispute settlement.

According to the ACAP, it is working to develop a feeling of "This Area Belongs to Us, Not Merely to the Government, and We Have to Protect It" among the local indigenous peoples. The ACAP claims to have prioritized the rights and ancient customs and culture of the indigenous peoples. ACAP also states that decisions over local issues are to be undertaken with participation of the communities since they have been facilitating and helping to empower, promote and continue the traditional institutions of the indigenous peoples.

Despite these claims, the role of customary institutions has been becoming weaker in the area since CAMCs hold the rights to forest conservation and control, levying and collecting royalties and using the collected royalties for development activities. According to Ngisyangwas, the ACAP's role in conserving, promoting and developing the customary institutions, culture and traditions is not remarkable despite its efforts in that direction.

## Conclusion

The indigenous peoples in Nepal have an inalienable relationship with natural resources, including the forests, lands and waters, in terms of social, cultural, religious, economic and spiritual aspects. For centuries, they have been exercising their own distinct customs, customary laws and practices for the conservation, promotion and sustainable management of the lands, forests and waters along with various forms of natural resources existing in their areas.

Many such traditional practices, knowledge, and the customary governing system are already extinct or defunct due to the intervention by the state and subsequent implementation of various acts and policies on land and forests. However, these traditional practices have made substantial contributions to conservation and management of natural resources. The indigenous peoples' customary practices and governing system, so far, have been playing an effective role in the conservation and sustainable management of their natural resources.

The indigenous people living in the mountain regions of Nepal, have continued with the customary laws and practices to manage the way-of-life and conserve the natural resources to a higher degree than indigenous groups in other parts of the country. In particular, the Ngisyangwas of Manang have conserved their ancient Dhawa Shyarpa system, popularly termed as Mithewa, until today. It has been operating effectively to protect the forests, land and water along with various forms of natural resources.

Ngisyangwas have imposed a complete ban on the collection of green wood. Those breaching the ban are subject to monetary fines. Untill recently, the responsibility of guarding the protected forest was on the Dhawa Shyarpa. However, the responsibility is now jointly carried out by the ACAP and the Mithewas. The tradition of protected forest is particularly important for the people of Manang because most of the villages are located on steep slopes. Any village, in the absence of forest either on the top or the bottom of it, could easily be hit by drought, flood, landslide or rock fall.

Despite the ban, the collection of timber from these forests for the construction or renovation of public properties such as monasteries, schools, VDC buildings and bridges is allowed but only with permission of Mithewas. Likewise, village people, taking permission from the Mithewas, can collect timber required to make goods of religious and cultural importance, such as *chhorten* (stupa), *darchyo*, or *lungta* (prayer flags).

Ngisyangwas have also restricted the cutting down of trees from around the sites of religious importance, such as monasteries, sources of holy water and ponds believed to be dwelt by L-hu, the snake god. In this way, religious faith, social and cultural values and norms of Ngisyangwas seem to have a very important role in the conservation and sustainable management of their land and forests. Be it a customary law or the religious belief, all the customs and traditions have been effective tools in protecting the biodiversity and maintaining ecological balance.

Among so many distinct and unique traditions and customs, the collective management of pasture lands and forests is an equally important system existing in the Ngisyang community. Under the customary laws, the natural resources used, protected and promoted by the people from one

village cannot be used by the people from another village in Ngisyang Valley. If a person or village has to use the natural resources belonging to another community, they are bound to first obtain permission from the concerned Dhawa Shyarpa or Mithewa. Following the request from the outer community, Dhawa Shyarpa and Mithewa, with consultation with the local people, allow the needy to use their natural resources in exchange for monetary reimbursement. Customary laws of this kind show that the locals have first rights to the use and access to natural resources prevailing in their community. Exercised for centuries, the traditional indigenous customary governing system also teaches us a lesson that it is the prerogative of the local peoples whether they permit another community to use their natural resources. Clearly, these customary laws and practices prevalent in the Ngisyangwa community, with supports of Mithewas, contribute significantly to the success of the society and the conservation and management of the forests, agricultural and pasture lands.

The religious beliefs, social and cultural values of Ngisyangwas have played an important role in the protection and sustainable management of their land, forest and other resources. At the same time, they have conserved biodiversity, maintained ecological balance and helped to reduce the increasing pace of carbon emissions. In contrast, modern land and forest acts, regulations and policies of the government, have not recognized these effective and long-standing customary laws and practices. In fact, government policies have served to deprive indigenous people from ownership rights to forests and pasture lands. Faced with these discouraging policies and acts, the indigenous peoples, as a result have increasingly been exercising their ancient practices with many uncertainties.

It is therefore imperative that the indigenous peoples be guaranteed with legal, constitutional and administrative provisions in relations to their collective access, ownership and control over their water, land, forest and other natural resources as ensured by the different international legal instruments, particularly the UNDRIP and ILO Convention-169.

Endnotes

1 Chhairotan, Tingaule Thakali, Thudam, Free, Bankariya, Bahragaule, Tangbe, Marphali Thakali, Larke, Siyar, Surel.

2 Khangsar, Tanki Manang, Manang, Bhraka, Ngawal, Gyaru, and Pisang

3 Chame, Tachaibagarchhap, Thoche, and Dharapani

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## Climate Change Concerns: Traditional Knowledge, Cultural Practices and Education in Nepal

**Pasang Dolma Sherpa**

### Introduction

Climate change poses a major global concern due to the rapid change in mean temperature and its impacts on the livelihoods of people resulting from melting of ice and snow cover, glacial lake outburst floods (GLOFs), landslides, sea level rise and frequent changes in rainfall patterns all over the world (UNFCCC, 2006). Impacts of climate change are visible, both in developed and developing countries, however, people in developing countries are more susceptible to them. Climate change is caused by the massive exploitation of natural resources in the process of development and modernization in the developed countries. The resulting climate change impacts are more pronounced in the Least Developed Countries (LDCs) like Nepal because of the low level of awareness about climate change and poverty. Trosper and Parrotta (2012), state "There is a growing appreciation of the value and importance traditional forest-related knowledge, and of traditional knowledge more generally, not only to local and indigenous communities, but also to the broader metropolitan, increasingly globalized, societies" (p. 4). As mentioned by Trosper and Parrotta about the value of indigenous and local traditional knowledge and cultural practices for the sustainable management of natural resources and livelihoods, it is important to raise the level of awareness about climate change based on available local traditional knowledge and cultural practices, in order to develop long-term solutions to climate change.

Nepal is a country of immense cultural diversity with more than 92 mother tongues spoken by different indigenous nationalities (CBS, 2001). The government of Nepal has recognized 59 indigenous groups with unique

traditional knowledge, cultural practices and language (NFDIN Act, 2002). Since traditional knowledge and the cultural practices of indigenous peoples have a close symbiotic relationship with nature, promoting and preserving this knowledge and practices will promote a more sustainable environment, livelihoods and development. In this regard, Trosper and Parrott ( 2012, p. 4) write,

> *"Traditional forest-related knowledge, innovations, and practices can contribute to sustainable development in several ways. Most indigenous and local communities live in areas containing the vast majority of the world's forest (and agricultural) genetic resources, including most of the world's terrestrial so-called biodiversity hotspots. The traditional knowledge and techniques used to sustainably manage and use these genetic resources and ecosystems can provide useful insights and models for biodiversity conservation practices and policies"*

The authors here emphasize the important contributions by indigenous and local communities to sustaining of the natural resources, ecosystem, and biodiversity through their traditional forest-related knowledge, skills and practices. These contributions need to be included into climate change-related policies and practices. However, indigenous peoples' traditional knowledge and cultural practices are embedded and expressed in their languages, cultural values, rituals, folklore, and land use practices. Community-level decision making processes that contribute to the management of natural resources to sustain the environment and development are often orally passed down from generation to generation. Therefore, proper documentation and transfer mechanisms of these processes through education for future generations is vital for their protection and in finding long-term solutions to the impacts of climate change.

Article 6 of the convention on climate change, "Education, Training and Public Awareness" (UNFCCC, 2002) gives high importance to the education on the technical aspects of climate change. This issue has also been recognized by many countries, including Nepal as evidenced by the efforts to develop a curriculum on climate change. Yet the understanding of how traditional knowledge and local cultural practices can be adapted to help address climate change, requires more emphasis. This paper explores climate change concerns through the lens of indigenous and local traditional knowledge and cultural practices. Such an examination not

only helps to understand climate change, but also supports the sustainable management of resources, ecosystem, biodiversity and transfer of knowledge to future generations.

## Climate change concerns

Climate change has been a major global concern since the adoption of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 because of the threat global warming poses for human beings and ecosystems (UNFCCC COP 20 and CMP 10, 2014, p. 9). Although climate change refers to any change in climate over time, either due to natural variability or as a result of human activity (anthropogenic causes), UNFCCC puts more emphasis on the effects of human activity due to the continued exploitation of natural resources, particularly carbon-based fuels, that have increased the global levels of greenhouse gases. Climate change impacts have become increasingly measurable and visible in the least developed countries like Nepal, where people at the community level have been directly affected by these impacts. Although the developed countries are the main causes of global warming and changes in temperature and to the atmosphere, none of the countries are free from these impacts. As mentioned above, compared to the developed countries, developing countries and LDCs are disproportionately affected by the impacts of climate change because of a lower level of awareness and adaptation capability to the changing patterns of weather and climate in their daily lives. It is crucial to understand the global climate change concerns and the way they have been addressed by the countries at the national and community level. Whilst the aforementioned findings of Trosper and Parrotta portray the valuable role and contribution played by indigenous and local traditional knowledge and cultural practices for the sustainable protection of environment and development, this paper will specifically address the impacts of climate change at the global, national and community levels. The question of how each level has dealt with the role of indigenous and local traditional knowledge and cultural practices that address climate change and the transfer of that knowledge to future generations through school-based education, is examined.

## Global climate change concerns on traditional knowledge for sustainable environment

Presently, concerns about climate change have become a global agenda because of the possibility of a global natural disaster and the apparent

imbalance between the environment and humans. IPCC (2013), states that "The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen and the concentrations of greenhouse gases have increased". These are some of the reasons why The First World Climate Conference (1979) identified climate change as an urgent world problem and issued a declaration calling on governments to anticipate and guard against potential climate hazards. Since then, A World Climate Program was set up, followed by the establishment of the World Meteorological Organizations (WMO), the United Nations Environment Program (UNEP), the International Council of Scientific Union (ICSU) and several intergovernmental conferences on climate change in order to jointly reduce the emission of greenhouse gases to protect the environment for the health and benefits of everyone. In 1988, WMO and UNEP established the Intergovernmental Panel on Climate Change (IPCC) to assess the magnitude and timing of changes, estimate their impacts and present strategies on how to respond to the impacts of climate change. In 1990, IPCC published the First Assessment Report on the state of the global climate, which has been the basis for negotiations under the United Nations General Assembly on a Climate Change convention beginning in late 1990 (UNFCCC, 2006). This has been continuously providing updated information to climate change negotiators to make timely decisions and take appropriate actions to address the impacts of global warming. IPCC presents the possible future climate changes, risks and impacts as follows;

> *Continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems. Limiting climate change would require substantial and sustained reduction in greenhouse gas emissions, which, together with adoption, can limit climate change risks (IPCC, 2014, p. 8).*

To address the possible climate change, risks and impacts as stated by IPCC, the United Nations General Assembly began negotiations at an international climate change convention in 1990 resulting in the UNFCCC, which was adopted and opened for signature in 1992 and entered into force in 1994. For the first time, in 1995, a Conference of the Parties (COP) 1 of UNFCCC was held in Berlin, Germany, culminating

with the Berlin Mandate. Since 1995, the COP has been held annually. The most recent COP 20, was held in Lima, Peru in 2014. Over the span of more than two decades, the negotiations to address the impacts of climate change have been ineffective and not very promising. The developed countries, particularly the USA, Canada, Australia, Japan and the European countries have not kept their promises to reduce their greenhouse gases under as per the Kyoto Protocol during the commitment period of 2008-2012 (Kyoto Protocol, 1998). The second commitment period from 2013 to 2020 agreed to in Doha during COP 18, is still not functioning as only a few states (21 out of 144) have signed on, so far (UNFCCC, COP 20, 2014). As per the decision in Durban during COP 17, the concept behind the Durban Platform Enhanced Action (DPA) is to bring all the countries on to the same platform to address climate change by 2015. However, this mission has not yet been realized because many of the emerging developing countries like China, Brazil, South Africa, India and Russia are emphasizing that developed countries should have more commitment to reduce their greenhouse gases and should not be allowed to bring terms or conditions of those commitments to the table. This is one of the reasons why the expected outcome in Lima could not be met and thus the negotiations will continue during the inter sessional meetings until the next COP 21 in Paris, where hopefully the states will come up with another legally binding instrument under DPA along with the Intended Nationally Determined Commitments (INDCs) and become fully functional after 2020.

Reflecting on the global climate change negotiations, it seems that none of the countries are very serious about reducing their emissions at the country level, nor is there a sense of strong commitment to address specific climate change issues. The findings of the International Energy Agency (IEA, 2006) show that all the developed countries including USA, Canada, Australia, Sweden, and Qatar have the highest levels of energy consumption with over 10,000 kilograms of oil per capita. In comparison, the lower energy consumption countries like China and Brazil use 2001 to 2500 kilograms of oil per capita and lowest level of energy consumption in LDCs is exemplified by Nepal with 341 kilograms of oil per capita. These data clearly indicate that the countries with the highest levels of energy consumption need to lower their energy consumption requirements in order to reduce the greenhouse gases to reduce their contributions to climate change.

Although emissions are higher among these emerging developing countries in comparison to the least developed countries, they are not ready to reduce their emissions as they believe that the main cause of global warming has much less to do with them than the developed countries. With climate change negotiations stuck at this level of disagreement, very little attention is paid to the values of traditional knowledge and cultural practices for sustainable environment and development. Local knowledge of indigenous peoples, their cultural practices and their livelihood strategies can be very helpful in addressing the concerns of climate change impacts. The discourse on their importance has already begun to draw attention from global communities, especially when indigenous peoples are still contributing towards protecting the world's remaining forests with rich biodiversity which in turn, helps to reduce effects of greenhouse gases. Therefore, it is absolutely critical to recognize and respect this important contribution.

Indigenous peoples comprise 5% of the world population, yet manage around 80% of the planet's biodiversity (Galloway-MacLean 2010, cited by Trosper and Parrotta, 2012, p. 3). This clearly indicates that in order to protect the environment and maintain sustainable development, it is urgent that the traditional knowledge and customary practices of indigenous peoples are recognized and respected by negotiators during the UNFCCC. In this regard, Indigenous Peoples have been engaged in the UNFCCC process since 2000. Indigenous Peoples' non-governmental organizations could apply for observer status under the convention and those that were accepted could nominate participants to sessions of the different bodies under the convention. Thus indigenous peoples' representatives could follow up at different sessions during the meetings of UNFCCC. The members of the International Indigenous Peoples' Forum on Climate Change (IIPFCC) have been active in addressing the issues and concerns of indigenous peoples to ensure that the different thematic groups under the UNFCCC incorporate their traditional knowledge and their cultural practices into a sustainable solution to climate change and its impacts. International Indigenous Peoples the Forum on Climate Change (IIPFCC) is the joint indigenous caucus in the UNFCCC process, a body that was created to engage indigenous activists that wish to participate in the negotiations at any given time during the meetings of UNFCCC (IWGIA, 2014).

The concept of Reducing Emission from Deforestation and Forest Degradation (REDD) emerged during the meeting in Bali (Bali Climate Change Conference, 2007), when the 4th Assessment report of the Intergovernmental Panel on Climate Change (IPCC) was released in 2007 which estimated that deforestation and land-use changes account for 17% of the global Green House Gases (GHGs). It has been predicted that if REDD is implemented properly, through its contribution to forest conservation, a reduction in temperatures of 1.5 to 2 degree Celsius could be achieved. Since indigenous peoples, who live in and depend on forests, have developed and sustained an intricate relationship with the forest and view forests in a much more holistic way (Tauli-Corpuz et al., 2009), their views and concerns have recently started to be taken into consideration during the climate change negotiations regarding policies and its implementation by member states.

Although the series of conferences and meetings on addressing climate change began in 1979, within the span of the last 35 years, the efforts to combat the impacts of climate change, have not yielded the expected results. This is particularly true with respect to the promotion and protection of traditional knowledge and customary institutions for sustainable forest, natural resources, ecosystem and biodiversity management at the national level for sustainable environment and development. Although indigenous peoples and local communities have been prominent actors during the global climate change negotiations at UNFCCC to address climate change concerns, it is equally important to explore how the recommendations and concerns of indigenous peoples are reflected in the respective countries at the national level.

## Climate change vulnerability of Nepal

Nepal is a mountainous country with three ecological zones; mountains, hills and plains. It has a rich cultural diversity that comprises 125 castes/ethnic groups (CBS, 2011), out of which the government of Nepal has already recognized 59 indigenous nationalities with unique languages, tradition and cultural practices (NFDIN, 2001). The Ministry of Environment states that, "Nepal's wide climatic and topographic variation includes 118 ecosystems, 75 vegetation types, and 35 forest types." Although Nepal ranks 25th in the world in terms of biological diversity (MoE, 2011) and possesses rich cultural diversity, it remains one of the most directly affected countries by the impacts of climate change due largely

to negligible causes. A study carried out by NAPA/MoE (2010) indicates that Nepal only has 0.4% of the world's population and is responsible for only about 0.025% of the annual greenhouse gas emissions yet is disproportionately vulnerable to climate change impacts. The impacts have been more severe amongst peoples in the rural communities, whose livelihoods are still dependent on subsidiary farming, because of the lack of information on climate change and inability to understand the changing patterns of climate. A study done by BBC's International Charity, Media Action (2013) in seven Asian countries, including Nepal, found that a general lack of access to information on weather and environmental changes in Nepal by the most vulnerable groups.

Taking Nepal as a case study, the new Climate Change Vulnerability Index (CCVI) released by the global advisory firm Maplecroft (2011) ranks Nepal as 4th amongst 170 vulnerable countries. A point has now been reached where there are no longer any other options for survival other than to take action to create solutions to the climate change-related problems. As mentioned in the introduction, there is a great need to raise the level of awareness and to build capacity concerning climate change by balancing the existing indigenous and local traditional knowledge with innovation to improve livelihood practices. It is equally necessary to gauge how the national climate change initiatives have addressed climate change concerns for sustaining the environment and development in Nepal.

Nepal has been a signatory to the climate change convention since 1992 and is mandated to follow up the agreements of the climate change convention to address the impact of climate change both from adaptation and mitigation measures (UNFCCC, 1992). Although Nepal is one of the lowest contributors of GHGs emission (0.027%), it bears much of the impact (Republica, 27th Dec., 2013). It is important to understand the context of climate change conventions, and how the higher emission level contributors like the industrialized or developed countries and the developing countries like Nepal take part in the negotiations. It is only from within this context that the current and future possible adverse impacts of climate change in vulnerable countries like Nepal can be understood and subsequently negotiated. Along with negotiations, it is equally important to understand how the discourse on climate change education under article 6 of the convention, which addresses traditional knowledge and cultural practices and its implications and applications, in Nepal.

The Fourth Assessment Report (AR 4) of the Intergovernmental Panel on Climate Change (IPCC, 2007) indicated that during the 21st century, the global surface temperature would rise a further 1.1 to 2.9$^0$C for the lowest emission scenario and 2.4 to 6.4$^0$ C for the highest. Although the parties to the UNFCCC have agreed to cut emissions and limit the future global warming to below 2.0$^0$C relative to the pre-industrial level, Nepal has taken a stand to limit the rise of future temperatures to below 1.5$^0$C because of the higher impact of climate change on mountains and mountain communities in Nepal. The Climate Change Policy of Nepal, 2011 mentioned that despite having only 0.4% of the total global population and being responsible for only 0.025 percent of total global GHG emissions (GoN, 2011), the average annual rise of temperatures in Nepal is 0.06 $^0$C and is much higher than the global rise in temperature which is only 0.025$^0$ C (Shrestha, 2008).

In order to address the possible hazardous impacts of climate change, the Climate Change Policy has set a target to distribute 80% of the available climate change funding to grassroots-level initiatives. These initiatives, identify and document climate-friendly, traditional techniques, indigenous skills, knowledge and their applications, and make necessary improvements to traditional techniques and technology to promote their practical uses. However, there has hardly been any implementation of these initiatives, particularly through formal and non-formal education in Nepal. It is imperative that the climate change policies and programs not only focus on the distribution of the funds at a local level, but also aide directly with developing a strategy to raise awareness levels. The existing indigenous and local traditional knowledge and the cultural practices already in place to adapt to and mitigate against the negative impacts of climate change in Nepal, must be effectively leveraged.

## The value of traditional knowledge and cultural practices for addressing climate change adaptation and mitigation

Addressing climate change and its impacts has been the mainstream discourse both at the global and national levels but the trend of finding solutions is still based on the principle of modernization, namely "Once size fits all". It is often the case in least developed countries like Nepal that the same pattern of modernization and development to address climate change is followed without exploring the values of the existing best practices of indigenous and local traditional knowledge, which play a very important role in addressing climate change.

Previous research clearly demonstrates that indigenous traditional knowledge and cultural practices play a valuable role in protecting natural forest, natural resources, ecosystem and global biodiversity. The latest Intergovernmental Panel on Climate Change (IPCC) Assessment Report (AR5), on Impacts, Adaptation, and Vulnerability acknowledge that,

*"Indigenous, local, and traditional knowledge systems and practices, including indigenous peoples' holistic view of community and environment, are a major resource for adapting to climate change, but these have not been used consistently in existing adaptation efforts. Integrating such forms of knowledge with existing practices increases the effectiveness of adaptation" (IPCC, 2014).*

The (IPCC, 2014) report highlights the important role played by indigenous and local traditional knowledge and their practices to adapt to climate change. The holistic view of community and environment held by indigenous people, encourages an integration of traditional knowledge with effective, modern climate change adaptation techniques. More often than not, however, negotiators and policy makers are hesitant to acknowledge the crucial role played by indigenous and local traditional knowledge towards effectively adapting to and mitigating against the impacts of climate change. Fortunately, this view is changing and there is a growing appreciation of the value and importance of the traditional forest-related knowledge, innovation, cultural practices and traditional customary institutions. This change is not only limited to local and indigenous communities, but is far reaching, extending to more metropolitan areas, and increasingly to other globalized societies. There is a definite need to realize the importance of traditional knowledge and techniques and their application to managing the ecosystem and genetic resources as a model for biodiversity conservation practices and policies (Trosper & Parrotta, 2012). In relation to this, Parrotta & Agnoletti (2012) state,

> *Traditional forest-related knowledge and associated management practices have sustained local and indigenous communities throughout the world under changing environment, social and economic condition, long before the advent of formal forest science and 'scientific' forest management. Through long experience of inter annual and longer-term variability in climate, many such communities have developed significant bodies of knowledge, transmitted through the generations, on how to cope with local*

*climatic shifts and impacts of extreme weather events and other natural disasters. This includes knowledge related to weather prediction, of wild plant and animal species and their management, and agricultural techniques for managing and conserving water and soil resources* (p.489).

Traditional knowledge and cultural practices are often used amongst indigenous communities for weather forecasting and monitoring, and to plan agricultural activities, but this knowledge is not recognized in our formal and non-formal education system in our country. Our children are thus deprived of gaining an insight in to the existing local practices of natural resource management. Indigenous peoples of the world have been urging, through different international and national forums, that if their cultural diversity, traditional knowledge, innovation and practices are not protected and ensured, it would not only disturb any semblance of harmony with nature, more importantly it would render any solutions towards a sustainable environment and development, nearly impossible. Perhaps, this has been one of the reasons why the Government of Nepal ratified the Convention of Biological diversity (CBD) on 23 November 1993, where Article 8 (J) of the convention is dedicated to "Traditional Knowledge, Innovations and practices" which state:

*Each contracting party shall, as far as possible and appropriate: subject to national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biodiversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge innovations and practices.*

The government of Nepal has ratified the CBD and has thus valued the indigenous and local traditional knowledge for the conservation of biodiversity, ecosystem and nature. Nepal has also ratified the International Labor Organization Convention No. 169 (ILO C 169); voted in favor of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) in 2007; supported the promotion and protection of the traditional knowledge and cultural practices and endorsed the revival of the customary institutions that have been followed and practiced for

generations. These are great achievements of the government of Nepal and the Nepali people for reflecting back on our norms and values that contribute to sustaining our environment and development models. However, the implementation of these commitments is weak due mainly to challenges in understanding the core values. Countries like the Philippines and Australia are prime examples of where the Government has not only valued traditional knowledge and skills but it has also recognized the implementation phase; "Traditional weather forecasting has been recognized by the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), which considers such traditional forecasting techniques to be supple mental to scientific weather forecasting… Several countries have indigenous knowledge-sharing program for weather forecasting. In Australia, for example, the Indigenous Weather Knowledge Website Project, funded by the government, displays the seasonal weather calendars of Aboriginal Australians" (Bureau of Meteorology, 2011, cited in Parrotta & Agnoletti, 2012, p. 492 ).

Indigenous peoples living in various different eco-system are at the forefront of being affected by the impacts of climate change, "…their traditional livelihoods ranging from rotational agriculture, hunting and gathering, pastoralism, high mountain livestock…among others, are undermined because of climate change…adverse impacts on traditional livelihoods and their ecosystem will also mean loss of traditional knowledge, innovations and practices associated with these livelihoods and ecosystems" (Tauli-Corpuz et al., 2009, p. 12-13). This is another reason why it is important to address the impacts of climate change concerns as well as to protect traditional knowledge, innovation and collective cultural practices, which have been resilient to the impacts of climate change. It is equally important that, as already stated above, these need to be balanced with existing emperical data, early education of the pertinent issues in order to determine best practices for sustainable developmentwhile minimizing impacts on the environment and development.

## The values of climate change education based on local traditional knowledge and cultural practices

Education has always been the priority in both the Millennium Development Goals (MDGs) committed to in 2000 and the continued agenda of post-2015 sustainable development goals. Education, without the contribution of the cultural diversity for sustainable environment and development, is

not possible as has already been indicated by sub-goal 4.7 of the proposed goal 4 under the title of "quality education" (IISD, 2014). The discourse on climate change education is also a priority of the UNFCCC for its effective implementation at the national level both through formal and non-formal education.

In 2002, during COP 8 in Delhi, the focus was on Article 6 of the convention, "Education, Training and Public Awareness" to address the challenges of communicating, teaching and learning about climate change. Decision 11/CP.8 of UNFCCC states, "a five-year country-driven work program engaging all stakeholders in the implementation of Article 6 commitments and recommending a list of the Article 6 related activities that could be undertaken at the national level" ( UNFCCC, 2002). Although the COP 8 decision invited parties to implement Article 6 at the national level, the 1st Dialogue on Article 6 of the Convention was held during the thirty-eighth session of the Subsidiary Body for Implementation on 10th and 11th June 2013 with representation from Parties, intergovernmental and non-governmental organizations (Bonn Climate Change Conference, June 2013). During this event, the author represented the International Indigenous Peoples Forum on Climate Change (IIPFCC). It was an opportunity to share many experiences from working in the field of climate change programs in Nepal. One of the approaches that is currently being developed is the inclusion of local indigenous people and their knowledge of and cultural practices for sustainable management of forest, non-timber forest products, biodiversity and ecosystem for sustainable environment and development.

The Global discourse on climate change education, particularly under Article 6 of the convention of climate change, UNFCCC has also influenced the government of Nepal for developing a suitable climate change education curriculum and educational materials. There have been a number of workshops and meetings for the specific purpose of developing a curriculum and materials on climate change concerns through formal and non-formal education. However, unlike at the global level, the discussion on climate change education continues, but is not free from the normal trend of education with its influence from the monolingual British education system adopted by the government of Nepal (NNEPC, 1956). The discourse on the development of a new climate change curriculum and materials supported by different bilateral and multi-lateral agencies in

Nepal is heavily influenced by western ideology and values. These do not reflect the local knowledge and value system that has been contributing to sustaining the environment and development. Unable to pass this knowledge to the future generation, the new generation will be aloof and without the capacity to function within the existing local values and norms. This is another challenge of bringing a sustainable climate change solution in Nepal. Therefore, it is pertinent to reflect back on our own education trends and see how one could place a value on existing traditional knowledge, innovation, indigenous practices, and local communities, and transfer it to future generations through formal and non-formal education. It is an absolute requirement, in the present context of Nepal, to develop a curriculum or text books on the topic of the impacts of climate change specific to Nepal.

The Ministry of Science, Technology and the Environment (MoSTE) in collaboration with the Ministry of Education's Curriculum Development Centre (CDC), launched a new initiative to educate secondary level students (grades 9 and 10) about climate change (MoSTE, 2012). Furthermore, recent national consultation workshops on Climate Change Education for Sustainable Development (CCESD) organized by the UN Educational Scientific and Cultural Organization (UNESCO) and Curriculum Development Center (CDC) on 17th July 2014 (UNESCO, 2014) aimed to address the integreation of climate change contents into teaching and learning materials for science classes at a secondary level as well as curricula development at the academic level. The discussion on the development of curriculum has hardly touched upon the core indigenous values, local knowledge, and cultural practices that are so vital to supporting the management of natural resources, the ecosystem and the rich biodiversity of the nation. Therefore, it is important to balance the values of a modern western education system with the locally prevalent traditional knowledge and culture in order to minimize the impacts of climate change. It is also pertinent that climate change policies and programs, including the climate change education curriculum, very clearly demonstrate the benefits of the existing local and indigenous knowledge and cultural practices to address climate change concerns for a sustainable environment and development.

The present school curriculum does not have separate subjects on climate change education. There are subjects about social studies, creative

arts, and local subject or mother tongue language from grades 1 to 5 in the primary education curriculum (CDC, 2006), but topics related to climate change are hardly covered. Science & Environment and mother tongue language or local subjects are taught from grades 6 to 8 in the basic education curriculum (CDC, 2012), but again, specific subjects on climate change are missing. Although subjects like social studies, health, population, and environment are taught from grades 9 to 10 in the secondary education curriculum (CDC, 2007), the specific content on climate change is deemed inadequate for the students. Moreover, it is necessary for children to understand their existing traditional knowledge and cultural practices and their role in adapting to and mitigation against the impacts of climate change.

The government of Nepal has already started the discussion about the inclusion of climate change subject matter into the curriculum of schools in Nepal, but it is unclear whether the values of traditional knowledge and cultural practices will be included in order for children to have a better understanding of climate change issues. Still, some schools in Lamjung have already started a local curriculum on climate change education based on local knowledge and traditional values of forest and natural resource management. Although there is no provision for a separate subject of climate change education at school yet, Janajagriti Secondary School in Lamjung has been a pioneer in developing the local curriculum and textbooks on climate change education by introducing local traditional knowledge, cultural practices, and the role of customary institutions. The school management committee, teachers, and parents are directly involved in developing a local curriculum of social studies subjects, where 20% of the subject is dedicated to climate change issues. This is an extremely good opportunity for both teachers and students to learn about climate change education and link it with the existing indigenous and local knowledge and practices in forest and natural resource management that contribute to the maintenance of biodiversity and the ecosystem of the community. This kind of leadership ultimately helps to sustain the environment and development which in turn can be passed on to future generations.

The head master of the school, Nanda Ghale says, "Developing local curriculum and text books on climate change and linking this to local traditional knowledge and cultural practices in Lamjung, has given opportunity to both teachers and students to learn the importance and value

of our existing knowledge that has been helpful for students to understand climate change and link to their day to day life. It has helped both teachers and children to understand climate change and place value on the protection of our traditional knowledge and culture…the local curriculum on climate change education with linkages to our traditional knowledge and skills was developed in collaboration with District Education Office (DEO), School Management Committee (SMC), Parents and students, which has been really popular and is currently in implementation in 5 schools in Lamjung" (Personal Communication, 8th August 2014).

## Conclusion

Every country has addressed the global concerns of climate change by developing policies and programs for sustainable environment and development. Although the efforts to address climate change started in 1992, an agreement to lower the emission of carbon into the atmosphere by industrialized countries has yet to be met. Under DPA, the recently agreed to Intended Nationally Determined Contribution (INDC) by developed and developing countries to reduce the level of carbon emission by 2015 (COP 20, 2014) is yet to be realized in the forthcoming COP 21 in Paris. To address climate change through the development of suitable adaptation and mitigation initiatives, the government of Nepal has developed the Climate Change Policy in 2011 with a focus on the flow of funds at the community level and also exploring the best options of traditional knowledge and practices for adaptation to climate change.

Article 6 of the convention, "Education, Training and Public Awareness" is focused on developing suitable materials and curriculum on climate change at the national level. In this context, the government of Nepal has already started developing the suitable climate change education curriculum, but how will the values of traditional knowledge and cultural practices be presented so that children have a better understanding of climate change and relate that in their day to day life is still not a topic of discussion and has not been incorporated into the curriculum. However, the initiatives of Janajagriti secondary school in Lamjung which has developed a local curriculum and textbooks on climate change based on traditional knowledge and cultural practices, has shown that if proper steps are taken, not only can children gain a better understanding of climate change, but they also learn to protect and transfer that knowledge and culture to future generations. Nepal can be a model country to share

knowledge and experience of developing educational materials and climate change education curriculum with a balance of modern education and indigenous and local knowledge and cultural practices to address the climate change for sustainable solution of environment and development.

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# Climate Change Policies, Safeguard Measure and Global Negotiations

## Climate Change Policies and Programmes

**Naya Sharma Paudel, PhD**

### Introduction

This article discusses Nepal's climate change policy and programmes in the context of the rich tradition of indigenous and local peoples' institutions, knowledge and technologies in natural resource management and sustainable development. The article consists of genesis of climate change policy and programmes in Nepal, its overall structure, strategies, processes and the policy-practice link. The article ends with identification and analysis of gaps in climate change policy and processes in Nepal.

Public policy often refers to the principled course of action taken by the highest political and administrative authority of a state and is consolidated through legal and regulatory measures and budgetary allocations. In simpler terms, policy can be understood as a set of purposive actions taken towards achieving public welfare. Accordingly, it can be defined as a principle or protocol to guide decisions and achieve rational outcomes through a statement of intent, and is implemented as a procedure (Anderson, 2005). However, according to Shore and Wright (1997), "Policies are inherently and unequivocally anthropological phenomena, which can be read as cultural texts, rhetorical devices or discursive formations". In one extreme, policies can be identified as "political technologies that can frame and name, exclude or include, legitimize and empower certain actions and actors while undermining or marginalizing others" (Blaikie, 2001).

Policies are not dry static texts coded in policy documents. They are dynamic and adaptive so as to accommodate any changes in the local, national and international contexts and dynamics. Therefore, climate change policies and programmes should provide ample space for feedback channels through which local lessons and experiences can inform national level decisions (Lebel *et al.*, 2012). As climate change is the symptom of the most complex and dynamic earth system, any attempts to mitigate its impacts must be sufficiently adaptive and flexible to absorb the lessons offered by learning-based policy making (Ojha et al., 2012).

Despite criticisms on the credibility and utility of policy making from multiple angles and perspectives by government officials, donor agencies and development professionals, it appears that a good policy making process does seriously engage in reviewing, reflecting and rewriting or formulating policies for public wellbeing. This article aims to explore and understand the climate change policy process and its content with the assumption that it would help develop effective, equitable and sustainable responses to the climate change-induced problems and challenges in Nepal. It is recognized that there are no unique solutions, but rather several alternative paths of strategies and actions to choose from in responding to climate change threats. How these choices are made depends on answering questions such as; whose knowledge counts? Whose voices are heard? What processes of decision making is followed?

## Major policies on climate change in Nepal

During the last few years, the government of Nepal has developed several policies to respond to climate change threats. Nepal's involvement in international conventions and agreements has induced many domestic policy processes. Nepal ratified the United Nations Framework Convention on Climate Change (UNFCCC) in May 1994, and the Kyoto Protocol in September 2005. Upon formally becoming a party to these multilateral environmental agreements (MEA), Nepal has undertaken a number of actions, especially in climate change areas both domestically and internationally. In 2004, it submitted its first National Communication to the UNFCCC secretariat, and the second one will be submitted soon. The Ministry of Science, Technology and Environment (MoSTE) has been designated as the nodal agency in dealing with all the climate change related MEAs. Being a least developed country (LDC) member, it prepared and subsequently submitted, the National Adaptation Programme

of Action (NAPA) in 2010 and in 2012, the government developed the Sustainable Development Agenda and actively contributed in the Rio+20 conference outcome document "The Future We Want". Nepal has also progressed well in achieving the Millennium Development Goals (MDGs) and contributed to the recently released Sustainable Development Goals (SDGs) by the UN.

In the climate change arena, the MoSTE developed Nepal's first Climate Change Policy (CCP) in 2011 and has since been implementing the National Capacity Needs Self Assessment (NCSA), National Adaptation Program of Action (NAPA), Local Adaptation Plan of Action (LAPA), REDD Readiness Preparedness Proposal (REDD RPP), Pilot Program for Climate Resilience (PPCR), Mountain Initiative (MI) and a number of clean energy projects. In addition, the latest Three Year – 13th development—Plan (2013-2016) emphasizes the promotion of green growth strategies, making development activities climate-friendly, mitigating the adverse impacts of climate change, and promoting adaptation to reduce the additional vulnerabilities faced by poor, marginalized, and indigenous communities (NPC, 2013).

Development of NAPA is regarded as an important milestone on climate change policy initiative. It identified key areas of climate change related vulnerabilities, adaptation measures and developed proposals for priority activities (GoN, 2010). In addition, it also proposed to maintain a knowledge management and learning platform, which is being hosted by the National Academy of Science and Technology (NAST); and developed a multi-stakeholder coordination committee on climate change within MoSTE. The six areas of NAPA identified as priorities include: agriculture and food security; water resources and energy; climate induced disasters; forest and biodiversity; public health; urban settlements and infrastructure. Decentralized approaches to financing and implementation of NAPA activities are the key features of NAPA. While a multi-stakeholder and multi-sectoral approach is adopted at the centre, it has proposed that 80% of the climate change adaptation budget be spent directly by local agencies.

For implementing adaptation activities at a local level, the MoSTE has developed the local adaptation plan of action (LAPA). As of 2013, 70 LAPAs were prepared and more are under preparation (Fisher & Slaney, 2013). The LAPA framework provides opportunities to assess site-specific

vulnerabilities, identify adaptation options, and prioritise and implement the urgent adaptation actions. It aims to build an integrated framework that integrates development planning with adaptation planning processes and brings local governments to the forefront. It is committed to a bottom-up, inclusive, responsive and flexible approach as its guiding principles in climate adaptation. There is specific emphasis on supporting the economically poor and socially disadvantaged groups in their adaptation planning and implementation (Watts, 2012).

Climate Change Policy 2011 is the key government climate change document that guides overall legal and institutional framework for responding to climate change threats. As the preamble of the policy states, it was promulgated to promote climate adaptation and mitigation in response to the vulnerabilities and impacts of the global climate change which is affecting Nepal's people and ecosystems disproportionately (GoN, 2012). Promulgation of climate change policy is rationalized as an immediate and urgent measure undertaken by Nepal, which has triggered the formulation and implementation of several other national policies in order to utilize the opportunities created by the international climate change community's commitment to reduce poverty and achieve sustainable development to address climate change impacts on LDCs. Accordingly, the GoN's climate change policy intends to combine climate change with sustainable development (GoN, 2011). The key features of the Policy are: i) Bottom-up participatory planning; ii) Integrated approach to cross-sectoral coronation; iii) Ensuring the participation of poor people, Dalits, marginalized indigenous communities, women, children and youth in climate change adaptation and other climate change related programs; iv) allocation of 80 % fund to the local level; v) Poverty reduction and livelihood focus; vi) Mainstreaming of climate change adaptation into the national development agenda (GoN, 2011).

Globally, climate change-related policies have an intended goal that is closely linked with national development goals. For example, the 4th section of Nepal's climate change policy claims that formulation of the policy was required to utilize the opportunities created from the global climate change phenomenon for reducing poverty and achieving sustainable development (GoN, 2011 section 4). By extension, the policy goal is aimed at improving livelihoods by mitigating and adapting the adverse impacts of climate change, reducing emission and enhancing socio-economic

development paths (GoN, 2011 section 6). Climate Change Policy 2011 is the umbrella policy document aimed at making development efforts climate-resilient. The specific objectives are: (i) enhancing climate adaptation and resilient capacity of the local communities; (ii) adopting a low carbon development path, enhancing socio-economic growth and supporting sustainable development (GoN, 2011). It equally focuses on the formulation and implementation of design standards for construction of climate-resilient infrastructure.

A flavor of climate change related policies in Nepal is found in REDD+ Policy prepared by the Ministry of Forest and Soil Conservation (MoFSC). In particular, REDD+ readiness preparation proposal and National REDD+ Strategy (see chapter on Mitigation in this book for details) is referred to here. The REDD+ readiness process began in Nepal in 2007 with a relatively inclusive and participatory process. As a result, Nepal's Readiness Preparation Proposal (RPP) shows a fair understanding of the legitimate roles of diverse stakeholders: state; local communities; civil society organizations; and little of the private sector. The RPP fully recognizes the role of local communities in managing forests and benefitting from carbon financing, adopts a multi-stakeholder process mainly in forest and REDD+ governance process, emphasizes mainstreaming social equity and gender concerns at different levels of resource governance, and has integrated safeguards measures. These important features of REDD+ policy appear to have been founded on Nepal's established community-based forest management regime over last four decades.

The 13th Plan (2013/14 – 2015/16) is the most recent periodical policy of the GoN, which seeks to link climate change adaptation with sustainable development. The plan document introduces the concept of "green development" and adaptation to the adverse effects of climate change. The plan outlines the implementation of NAPAs at the local level, and proposes specific actions to ensure coordination and partnership amongst donors, non-governmental organisations (NGOs), local bodies, community-based organisations (CBOs) and other agencies. The plan further focuses on developing climate-resilient infrastructure and reducing poverty at the local level. Furthermore, implementation of the NAPA prioritized adaptation actions and developing LAPAs by the MoSTE as the coordinating and climate change nodal agency, are stated as further priorities of the 13$^{th}$ plan (GoN, 2013).

Nepal's climate change policy framework can be understood as a collective and integrated package of climate change response as stated in the CCP 2011. The 2010 NAPA, LAPAs and hundreds of Community Adaptation Plan of Actions (CAPA) have been combined as a part of the implementation process of the CCP. In this article, the term *climate change policy* is taken in its broader meaning, which comprises of various policies, programmes, plans, laws and legal regulatory frameworks that govern the country's response to climate change impacts and threats. However, as another article in this book is dedicated solely to the legal framework of climate change, the discussion in this chapter is limited to policy and institutional issues.

Climate threats become serious particularly in the context of fragile and transitional politics, partly because of the lack of robust institutions to deal with such threats (Gizelis & Wooden, 2010). Nepal's climate change policies and programmes appear to have not adequately considered the issues of governance, power and justice. These are important for both procedural and substantive reasons, as without due attention to such issues, it is impossible to mitigate and adapt to the increasing climate threats.

## Governance framework for developing and implementing policies

Nepal's climate change policies have adopted a multi-stakeholder approach to decision-making, planning and oversights of ongoing activities. Accordingly, several such mechanisms exist and are operating at different levels. The Climate Change Council is the major steering body at the apex level and is chaired by the Prime Minister (GoN, 2011). The Multi-stakeholder Climate Change Initiatives Coordination Committee (MCCICC) ensures coordination of GoN and development partners in relation to their relevant activities at the MoSTE level and is responsible in guiding the adaptation planning and policy formulation at the national level. At the ministerial level, a sectoral approach to adaptation planning and project-based approach to implementation, is being adopted. According to NAPA, the Ministries will be responsible for planning and implementation of adaptation activities under their respective sectors. Similarly, the Climate Change Program Coordination and Management Unit under the MoSTE, is responsible for the functional coordination and monitoring of projects/programs. At the district level, district climate change coordination committees, set up by the district Development

committee (DDC), are responsible for ensuring coordination, monitoring, planning and implementation of projects. District-level offices of participating line ministries, NGOs and private sector are represented in this committee. Existing local institutions such as the community forest user groups (CFUGs) and water user groups, farmers' groups and private enterprises that operate in the sectors that are linked to climate change related programmes and projects, are identified as the implementing actors (GoN, 2010). Recently, the government has developed and approved a new mechanism to orient local governments on environmental issues with clear mandates to environmental management including climate change to the Environment Unit of the DDC.

However, there are a number of challenges in the implementation of the CCP. For example, while MoSTE is the focal point for all climate change related policy implementation, it does not have its own institutional line agency at the local level. Consequently, the MoSTE has to rely on other ministries, in general, and local governments in particular, for conducting adaptation planning, implementation and resource mobilisation. The LAPA process strongly follows the spirit of the Local Self Governance Act (HMG/N, 1999), in that it gives the central role to the local governments in adaptation planning and implementation. Recently, the MoSTE and the Ministry of Local Development (MoLD) (now the Ministry of Federal Affairs and Local Development (MoFALD) have agreed to work closely through local governments to plan and implement adaptation activities. While other ministries such as Home Affairs, Agriculture and Forestry are also playing important roles in supporting disaster management, mitigation (through REDD+) and adaptation, their role is less clear in the current CCP.

Although the CCP broadly follows the approaches taken by the NAPA, it is less explicit in the role of community-level institutions. As such, the CCP and the NAPA documents have not adequately recognized and promoted the role of all local government agencies in planning and implementing adaptation activities. However, on the other hand, LAPA has put a strong emphasis on the role of local government's implementation of climate change policies. But the LAPA process is silent on the role of community-based institutions such as FECOFUN. Consequently, there have been issues of non-recognition of the hundreds of CAPAs that development agencies are facilitating across the country.

The climate change policies have provisioned different implementation mechanisms, which are sometimes not adequately harmonized, are inconsistent and sometimes even contradictory. The problem of harmonization and consistency can best be observed in the institutional choice and arrangements for vertical and horizontal integration. For example, several scholars have highlighted the weak vertical coordination and integration among different levels of institutions (Bird, 2011; Tiwari et al., 2014). The national level entities such as Climate Change Council and the MCCICC are mandated to coordinate and oversee all climate change related activities at the national level. Similarly, the Climate Change Program Coordination and Management Unit at the MOSTE has been nominated to perform functional coordination and monitoring of projects/programs. However, the roles and responsibilities of the local governments and the community institutions are not fully clear in relation to the roles of different agencies at the centre.

Horizontal coordination is equally important for translating the national policies and plans into adaptation activities at local levels and integrating local adaptation activities into higher levels of planning. Studies have highlighted the gaps in coordination at different levels of climate change governance (Ayers, et al., 2011; Tiwari et al., 2014). While the GoN recently has taken the initiative of introducing environmental-friendly local government frameworks, the specific outcomes are yet to be observed.

Climate financing is one of the important aspects of climate change policies and programmes. There are several challenges in mobilizing finance and effectively channelling funds at the implementation level (Bird, 2011). The policy framework explicitly vows to transfer 80% of the funds meant for responding to immediate and urgent climate change threats at the local level. However, the international community has shown a huge concern about the financial integrity of Nepalese institutions – both state and non-state alike (Bird, 2011). They have also highlighted the fiduciary risks and inefficiency in handling large sums of funds allocated to climate change.

Nepal's climate policy framework is largely 'aid friendly' and generally fits the development approach as evidenced by the following. Firstly, the central idea is to support the poor and marginalized groups, communities and individuals who are 'vulnerable' to climate change. Secondly, there is a clear commitment to get 80% of the climate change funds to the local level by defining local level vulnerability issues as the main

challenge posed by climate change. Thirdly, the NAPA has identified a few key sectoral development programmes in terms of seven priority projects. Implementing certain identified project is often seen as being closely linked with the development project planning and implementation process. Fourthly, time and again, the authorities have explicitly clarified the fact that these policies are developed partly to attract international climate change funds, which increasingly are linked to development assistance with clear and explicit climate change outcomes. Fifthly, and most importantly, almost all the climate change related policies are part of a global aid framework and are strongly supported by various bilateral and multi-lateral aid agencies.

Climate change polices of Nepal in a collective sense are built on the strong grassroots dynamics and recognize the important role of community-based organisations (CBOs). The language of community level adaptation, community organisations and decentralisation reflects the presence of strong and vibrant collective action at the local level. The policies and programmes appear to have been adequately understood and appreciated as evidenced by the growth of community institutions and local level collective actions. Accordingly, there is a strong emphasis on and visible roles of community institutions and other local level actors.

It is not surprising that public policies of the post 2006 period have sought to adopt the new language of inclusive and participatory governance, equity and justice. In fact, Nepal is among the few countries, which has used 'climate justice' in its policy statement. The decade-long "peoples' war" in Nepal followed by a successful people's movement has forcefully established the discourses of justice and inclusion in both state affairs and societal domains. The language of inclusion, equity and justice are made explicit in CCP (GoN, 2011).

One of the important features of Nepal's CCP is its efforts to align adaptation with local development planning. Policies and practice of developing LAPA and CAPA at the local level have helped implement and monitor the climate change policy frameworks developed at the national level. Similarly, putting local government in charge of the climate change programme may help to align climate adaptation planning with development planning.

It is also important to note how knowledge on climate change policy

process is shaped, developed, circulated and consumed. As Nepal's climate change policies and programmes are largely shaped by international discourses and negotiation processes, knowledge on climate change is framed primarily by those dominant discourses (Nightingale, 2009). The knowledge of early indicators of climate change, impacts on the natural environment, agriculture and other sectors, and local and indigenous systems of adaptation are documented, synthesised and published mainly by powerful actors such as the state or donors. While major areas of inquiry are on the biophysical changes, there is relatively little study on the indigenous and local institutional aspects to understand and respond to such changes. Consequently, the dominant and hegemonic knowledge system seems to be strongly influencing Nepal's climate change policies and programmes on climate change mitigation and adaptation.

Nepal's climate change policy and programmes have faced a dilemma of supporting government vs. working through non-state agencies in addressing immediate climate impacts. Supporting government institutions would have resulted in long-term positive impacts by strengthening the capacity, performance and accountability of the state agencies. However, development agencies and their projects often tend to work directly through creating parallel structures or support non-state agencies expecting that they could be effective in terms of a timely response to local climate change-induced problems. Moreover, due to the lack of elected representatives and serious allegations of corruption and poor accountability, local government climate change programmes and projects often tend to choose community institutions such as CFUGs and water user groups among others for planning and implementing climate adaptation activities. While choosing community institutions is a safe and effective strategy to implement donor projects, it undermines the democratic and accountable authority at the local level. It has also resulted in uncoordinated and unsustainable initiatives. Such a dual approach may lead to duplication of efforts and poor targeting of the vulnerable people and their agenda. Often more funds are spent on meetings, publications, and raising awareness than on urgently needed actions to support coping measures and autonomous adaptation being adopted by the people using their indigenous and local knowledge and practices.

Nepalese society is highly differentiated due to economic status, gender, caste, ethnicity and spatial relations. Here, the vulnerability and the

ecological marginality are closely linked with social marginality (Blaikie & Brookfield, 1987). Consequently, the marginalized social groups have historically been excluded not only from accessing state resources but also from access to fundamental human rights. The political culture, state institutions, social hierarchy, and economic opportunities all shape an individuals ability to deal and adapt to climate change-related threats. As Jones (2010) argues, it is social barriers that largely shape a societies or and individuals' prospects of achieving sustainable development goals. In a highly differentiated society such as in Nepal, social exclusion may lead to restricted entitlements and therefore unequal access to adaptation resources.

The discourses of climate change as an environmental crisis, has produced specific power relations between various actors with respect to climate change policy and programmes (Nightingale, 2009). Generally, there appears to be a sense of crisis among the international aid agencies while for many local actors, it is only one of a dozen important issues. Consequently, while aid agencies interpret the situation as urgent and support one or another policy process, the challenge remains in fostering full ownership and implementation commitment of the domestic actors especially the national policy makers.

As climate-related changes are quite complex, unpredictable, and dynamic, the collection and analysis of empirical data alone, cannot provide a full explanation of its sources, manifestation and diverse socio-economic ramifications. Therefore, a better understanding of the dynamics of climate change must integrate objective, scientific knowledge on one hand, and local people's perceptions, practices and interpretative analysis on the other. While indigenous and local communities may not be able to provide a full explanation of the reasons for what they are observing and experiencing, they can challenge, correct and provide better interpretation of the climate change science, particularly in the local context (Baul et al., 2013). In this context, the climate change policies that facilitate meaningful dialogue between scientific knowledge with indigenous wisdom can ensure a much more effective and sustainable solution to climate change-induced threats.

In the context of development, climate change policies have also portrayed indigenous and local communities as vulnerable, passive victims and recipients of policies and programmes. This view, however, misses

the point that indigenous and local communities tend to interact more intimately with the local natural environment, and are thus more prone to the negative environmental impacts of climate change. This close and intricate connection between these people and nature has allowed them to acquire ample empirical experiences to ameliorate the anticipated adverse consequences associated with climate change (Nakashima et al., 2012). Therefore, it is important that climate change policies should learn and adapt from this rich knowledge system, practices and innovations that may be helpful in devising solutions to respond to many immediate and long term threats. Integrating indigenous and modern scientific knowledge would, in many ways, produce more relevant knowledge that could guide any climate change response actions in a more localized and situation-specific manner.

## Policy implementation challenges

The lead role of local governments is crucial for effective implementation of climate change policies and programmes. As climate change impacts and adaptation are inherently local, policies and programmes that encourage local initiatives are likely to result in more productive, efficient and sustainable outcomes. This requires the local government to play a leading role, serving to link local action to national planning and policy processes. There are three key arguments in favour of the lead role of local governments in responding to climate change threats (UNCDF et al., 2010). Firstly, as climate change usually has localized impacts, the response must be from the closest possible agency (Agrawal et al., 2009). Secondly, local governments can better mobilize local resources and knowledge so that the response mechanisms become as effective as possible (Rattana & Krawanchid, 2012). Thirdly, local government including DDC, can coordinate and pool resources from all other government line agencies. Local authorities are often the preferred agency to coordinate diverse line ministries and non-state actors at the local level. Fourthly, the lead role of an accountable, local government can also safeguard the interest of the poorest and most vulnerable populations from climate change (Agrawal et al., 2009).

Unfortunately, at this time in Nepal, caution must be taken with emphasising the role of local government in governing and implementing climate change responsive activities at the local level. This is mainly due to the lack of elected representatives in the local government for the last 16 years. As an ad hock

arrangement, the central government staff have run the local governments. It appears that the national ruling elites have shown little interest in revitalizing local government and other level systems of authority, which were much more vibrant before the rise of the modern state (Bromley, 1992). In the meantime, current forms of the local governments in Nepal have become the locus of poor governance and high corruption due to the lack of political oversight. The lesson therefore is that only elected local governments can perform their roles in a responsive, accountable and transparent manner in assuming the full responsibility of all local development and climate change adaptation affairs.

Responding to climate-induced threats requires as much of a socio-political solution as a techno-bureaucratic one (Oberien et al., 2007). Any response to climate change must confront and engage with international aid regimes, national political dynamics and local socio-institutional issues. Nepal's NAPA has provided an assessment of the current vulnerabilities based largely on changes in biophysical conditions, and has identified adaptation in the form of seven priority projects. Few high-level government officials have produced NAPA and other policy documents with technical support from UN and other INGOs and NGOs. Since these are prepared by national and international consultants, they are well written documents (Wiseman & Pandit-Chhetri, 2011). However, they still have content gaps. For example, the vulnerability ranking of the districts has been contested.

Climate change policies and programmes can achieve their intended goals only in the presence of legitimate, credible and capable institutions which implement those policies. However, the prolonged political transition, the frequent changes in the government and the unstable leadership in many public institutions, have undermined the legitimacy, authority, and capacity of the state institutions to enforce law and order, implement policies, monitor progress and impose certain incentives and disincentives. This is often attributed to low staff morale, lack of knowledge, expertise and commitment, and is combined with limited access to resources, information and technology. As a result, there are questions regarding the capacity of the state institutions to implement climate change policies and regulations as expected by the general public and funding agencies.

The GoN has appreciated and adopted multi-stakeholder processes in developing climate change policy and programmes. However, the multi-

stakeholder processes are not panaceas and have themselves faced a number of challenges in Nepal's public policy making process (Ojha, 2013). Not all relevant actors may have equally contributed to and influenced the processes. Many have felt a sense of exclusion and marginalization (Ojha, 2013). Moreover, there are questions about the representation of the actors in various multi-stakeholder mechanisms. Multi-stakeholder processes are questioned for their legitimacy, productivity and efficiency. In many cases, there is conflict between CSOs' populist agendas and the government's bureaucratic rationale. As a result, the full political and professional potential of multi-stakeholder bodies and the members have not been achieved.

Critics of climate change adaptation term this a political technology as it subtly helps to depoliticize the structural drivers of marginalisation that render many societies, groups and individuals more vulnerable than others (Ribot, 2011; Nightingale, 2009). For example, historical injustice over the access to and control over natural resources within the three century-long centralised state in Nepal has made the poor, women, Dalits and indigenous peoples more vulnerable to impacts of climate change than others (Nightingale, 2009). Climate change policies in many developing countries have focused on understanding and responding to biophysical changes and their multiple impacts on people's lives and livelihoods. Observing, measuring and predicting these changes has created platforms for scientists, environmentalists and planners who can contribute to sound policy making. Moreover, by focusing narrowly on i) the impacts of climate change on the biophysical environment; and ii) encouraging and supporting adaptation to such changes; the current climate change policy and programme framework undervalue the underlying causes of vulnerability and climate injustice. The climate change policies in many developing countries have projected the phenomena as objective, neutral scientific knowledge, which has to be appreciated and followed accordingly (Shore & Wright, 1997).

Inadequate attention to the underlying causes of vulnerability is a conceptually flawed approach and cannot lead to sustainable and equitable solutions to the climate crisis in developing countries such as Nepal. In fact, the differential impacts of climate change can clearly be attributed to different levels of vulnerability within society. Since ecological and social marginality are intricately linked (Blaikie & Brookfield, 1987), the poor

and vulnerable are the ones who bear the brunt of climate change impacts. As Ribot (2009) argues, vulnerability does not just fall from the sky, rather it is shaped by the socio-economic, political and cultural contexts and ability of the actors to cope with the changes.

If the climate change policies and programmes of Nepal were to reduce vulnerability through a better understanding and addressing of the underlying causes, then there should be a fundamentally different approach to developing these policies and programmes. The structural constraints and actor's capacity to respond and adapt to the changes that include shocks, stress and risks, from all factors including climate change, must be embraced and addressed. Policies and measures must focus on re-orienting the policies, programmes and institutional practices towards achieving sustainable development that includes environmental, economic and social interventions through legitimate, democratic and robust institutions at all levels.

## Conclusion

The climate change policies and programmes in Nepal are continuing to evolve and they are yet to take a robust, coherent and comprehensive form to provide holistic pathways to build a climate resilient society. Consequently, there are several internal contradictions, conflicts and confusions within various policy documents, institutional roles and mandates. Accordingly, the strategic choices between options are less explicit and there is limited analysis of potential synergies and trade offs.

The roles and responsibilities of different agencies in responding to the climate change threats are also unclear. From one perspective, the central state and its bureaucratic agencies are seen as key leading agencies in designing and implementing climate responsive activities. However, some other policies such as REDD+ have attempted to bring local and grassroots institutions to the forefront of climate change induced threats. However, despite acknowledging the need for proactive involvement of local institutions, there appears to be a lack of trust regarding capacity and performance of the local institutions in effectively responding to climate change related threats.

Therefore, the focus of the adaptation strategies of Nepal must expand beyond reducing climate change impacts and include holistic ways of reducing multi-dimensional vulnerability. This implies a better

understanding of the underlying causes of vulnerability and addressing the structural constraints faced by the indigenous people and other marginalized sections of society. This often includes mainstreaming vulnerability reduction strategies into policies and programmes for achieving sustainable development goals.

Climate justice needs to be considered as an important principle in Nepal's climate change policy. This explicit political position in understanding and responding to climate change threats has sought to recognize the centrality of the justice movement in Nepal's political, cultural, economic and environmental domains. Moreover, Nepal's climate change policy development reflects one of the important issues of the international climate change debate, especially between the rich industrial countries and the poor developing ones, on their relative roles and historical liability.

Another important discussion highlighted by this chapter, is the notion of policy itself. It has been demonstrated that policy statements alone can convey only a fraction of what actually happens on the ground. There are a range of actors, institutions and their strategic actions, which mediate the policy implementation process by interpreting and mis-interpreting the policy intents. Policy maneuvering therefore results gaps in policy provisions and implementation on the ground, as seen in the CCP of Nepal. As there are multiple actors in the field of climate change programmes and project implementation, the diversity of actors and the context shape policy outcomes in diverse ways, which the policy makers need to understand more completely.

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## Safeguard Measures in Climate Change Mitigation and Adaptation Initiatives of Nepal

**Tunga Bhadra Rai & Dil Raj Khanal**

### Context

The fundamental concept of safeguards in climate change related matters is to enhance social, governance and environmental benefits and to reduce all associated risks of climate change policy, strategy, plan and program at all levels. REDD standards state that " 'safeguards' are requirements or measures that aim to protect people and biodiversity and other environmental services from harm". (http://www.redd-standards.org/. December, 2014). Conservation International (CI) states that "safeguards not only serve to promote social and environmental benefits and protect against harm, they contribute to the overall effectiveness and sustainability of REDD+ (climate change mitigation and adaptation) by reducing undesirable outcomes for communities and ecosystems". (http://unfccc.int/methods/redd/redd_web_platform/items/7282.php).

Nepal, as a party to the United Nations Framework Convention on Climate Change (UNFCCC), is undertaking some initiatives on climate change mitigation and adaptation in which safeguard measures are supposed to be an integral part of any climate change adaptation and mitigation measures. It is important to put safeguard measures in place in order to avoid negative impacts of policies and programs on customary practices of natural resource management and livelihood of indigenous peoples. In other words, implementation of safeguard policy helps to ensure the protection

of indigenous peoples' rights over natural resources, their territories, and social justice. In this context, social justice means 'respect, protection and fulfillment of human rights, including the rights of indigenous peoples. This article provides an overview of the safeguard measures in climate change-related initiatives of Nepal. This paper discusses safeguard issues in climate change related policy framework and programs such as the National Adaptation Program of Action (NAPA)-2010, Climate Change Policy-2011, National Framework on Local Adaptation Plan for Action (LAPA) 2011, and country safeguards system in REDD+. This paper also briefs the institutional arrangement for climate change-related actions and compliance system for REDD+ readiness in Nepal. The arguments and data are based on literature review, key informant interviews, and direct observations. The existing policy framework and programs on climate change of Nepal were reviewed from current literature. Implications of those climate change policies and programs were drawn from observations and interviews. Informant interviews with key indigenous leaders added the important perspective of indigenous peoples.

Multiple sources of financing for climate change mitigation and adaptation have safeguard standards, for instance, Green Climate Fund (GCF), Global Environment Facility (GEF), Forest Investment Program (FIP), Forest Carbon Partnership Facility (FCPF) and UN-REDD Program are engaged with developing countries, including Nepal, for the development and implementation of climate change policy and programs. Those mechanisms have to have safeguards consistent with United Nations Framework Convention on Climate Change (UNFCCC) agreements, and other international instruments of human rights and indigenous peoples' rights. UNFCCC COP 16 Cancun Agreement recognizes the rights of indigenous peoples and other local communities in reducing emissions from deforestation and forest degradation, conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks (REDD+) activities. UNFCCC COP 17 and COP 19 have standards relating to Safeguard Information System (SIS) for REDD+ that requires each REDD+ country to develop SIS for REDD+ implementation. Additionally, Nepal has ratified more than twenty-five Multilateral Environmental Agreements (MEAs), including UNFCCC, and has eventually taken some initiative for climate change mitigation and adaptation.

## Climate change mitigation and adaptation initiatives in Nepal

Nepal ratified UNFCCC in 1994 and is developing policies and programs in line with the UNFCCC COP decisions. Nepal has developed the Rural Energy Policy 2006, National Adaptation Plan of Action (NAPA) 2010, Climate Change Policy 2011, and Local Adaptation Program of Action (LAPA) 2012, Subsidy Policy for Renewable Energy 2013 and bio-fuel policies, all remarkable actions for climate change adaptation and mitigation activities in Nepal. The Low Carbon Development Strategy and national REDD+ strategy are under development. Nepal, as a party of the Convention of Biodiversity (CBD), developed the National Biodiversity Strategy and Action Plan (NBSAP) 2013, which incorporates the provision for enhancing ecosystems and community resilience to climate change impacts (NBSAP, 2013). NBSAP has proposed an institutional mechanism for coordination among relevant agencies, though this proposal lacks clarity with regards to the compliance mechanisms.

The following section of the paper recounts the safeguard issues in existing policies and programs of Nepal.

## National Adaptation Program of Action (NAPA) 2010

The National Adaptation Plan of Action (NAPA) 2010 has identified six options for climate change adaptation (Box 1). People's participation and promotion of local livelihoods are taken as important criterion for all six prioritized adaptation options. NAPA recommends implementation of the adaptation options through interest groups such as indigenous peoples, local communities and community-based natural resource management groups. It has prioritized promotion of community-based adaptation (CBA), eco-system based adaptation, enhancement of adopting capacity of vulnerable communities, and empowerment of vulnerable communities. Special emphasis has been put on implementing gender-focused activities in order to address the impact of climate change on the livelihoods of women and vulnerable communities. However, the lack of participation

Box 1: Prioritized adaptation options in NAPA

- Agriculture and food security
- Water resources and energy
- Climate-induced disaster
- Forest and biodiversity
- Public health
- Urban settlement and infrastructures

of indigenous peoples in the adaptation planning process, the lack of capacity, and the limited awareness among interest groups and stakeholders including indigenous peoples, hinders the vulnerable groups and indigenous peoples to take part in the process and programs. Weak inter-agency coordination is further challenging the implementation of NAPA in Nepal.

During the interviews, indigenous peoples stated that indigenous values, the belief system, livelihood practices skills, knowledge and the consmo-vision are very much attached to the local environment and nature. The indigenous culture, as a whole, plays an important role in sustainable natural resource management and climate change resilient capacity enhancement[1]. Despite this, NAPA mentions customary laws and common values and practices of indigenous institutions in a very superficial manner. The plan does not have clear and effective safeguards to address the issues and concerns of indigenous peoples in the adaptation planning process. NAPA does not have clear safeguard measures, a reporting system against safeguards, and grievance redress mechanisms (GRM). Even if the NAPA programs are related to natural resource management, it does not provide clear institutional and legal frameworks for natural resources such as forest management and protection. Also, it does not ensure the rights of indigenous peoples regarding the natural resources enshrined by International Labor Organization (ILO) Convention 169, United Declaration on the Rights of Indigenous Peoples (UNDRIP) and other relevant international conventions and decisions of United Nations including of UNFCCC.

### Climate Change Policy (2011)

Climate Change Policy (2011) focuses on the community-based adaptation program in Nepal. This policy aims to maximize positive impacts and mitigate negative impacts of climate change, and it focuses on enhancing the resilience capacity of local communities for efficient management and optimum utilization of natural resources in climate change adaptation. The policy provisions to allocate at least 80 percent of available funds for field-level climate change adaptation activities, but it lacks clear mechanisms on how indigenous peoples and vulnerable communities could benefit from budget allocation and indeed, the program itself. Assurance of the participation of indigenous peoples and local communities including poor people, *Dalits,* women, children and youth in the implementation

of climate adaptation and mitigation programs is not well mentioned in this policy. Furthermore, this policy does not recognize the symbiotic and multiple relationships of indigenous peoples with natural resources. This situation reflects the fact that the climate change policy has some provisions for capacity building. However, it needs to ensure the rights of indigenous peoples and local communities to participate and access the climate change related fund, and to harmonize the safeguard principles recognized by ILO convention 160 and other international instruments. A binding legal framework has to be put in place in order for Climate Change Policy (2011) to be implemented in an effective manner.

### National Framework on Local Adaptation Plans for Action (LAPA) 2011

LAPA framework requires integration of climate adaptation and resilience activities into local and national planning through a "bottom-up", "inclusive", "responsive", and "flexible" process. "Bottom-up" planning means to address the needs, knowledge, skills and practices of climate vulnerable peoples including indigenous peoples, local communities and stakeholders in the adaptation planning process. The "Inclusive planning" focuses on ensuring identification and integration of the needs of households and communities with most severe risk of climate change, poverty, deprivation and social marginalization. LAPA focuses on "responsive(ness)" that has to ensure immediate, efficient and effective delivery of adaptation services to climate vulnerable communities and households. "Flexibility" in LAPA means to ensure timely delivery of administrative, financial and institutional services in order to implement adaptation actions effectively (LAPA, 2011). Nonetheless, LAPA has not defined how it accounts for safeguard issues of indigenous peoples.

Box 2: Seven steps for LAPA

1. Climate change sensitization
2. Climate vulnerability and adaptation assessment
3. Prioritization of adaptation options
4. LAPA formulation
5. LAPA integration into planning processes
6. LAPA implementation
7. LAPA progress assessment

According to the Plan for Action, the local government bodies are responsible for the mainstream adaptation activities that are part of

the local planning process. There is, however, a lack of clarity on how, exactly, local government is responsibile for carrying out LAPA planning and implementation. This situation is causing conflicts between local government and stakeholders at a local level. The seven steps of preparation as indicated in 'Box 2' are not followed in the process. This indicates weak implementation of the plan resulting from the unclear institutional framework which consequently challengings the safeguard issues in adaptation initiatives of Nepal.

### Subsidy Policy for Renewable Energy 2013

The Subsidy Policy for Renewable Energy (2013) aims to support usage of renewable energy for productive purposes thereby creating rural employment and enhancing the livelihoods of rural people, particularly women, the poor, and socially excluded groups and vulnerable communities by increasing their access to renewable energy. This policy has provisions for additional subsidies for renewable energy to households with single women, disaster victims, conflict-affected and poor people, and marginalized ethnic groups as identified in the legislations or policy instruments, to construct domestic biogas plants (an important source of energy in rural areas of Nepal). Briefly, the renewable energy program is a highly prioritized program for climate change mitigation and adaptation purposes in Nepal.

Despite these provisions and priorities, the target groups mentioned above, do not have access to the incentives. This policy gives a high priority to the private sector for the implementation of incentives and ignores traditional institutions and practices of indigenous peoples, whereas traditional institutions and practices are the ones well accepted and practiced by local peoples. Indeed, experience shows that traditional institutions, knowledge and practices play an important role for resource management and community governance.

### Country safeguards system in REDD+

The country safeguards system for REDD+ is yet to be developed, though a few background works have been completed as part of REDD+ readiness in Nepal (REDD Cell, 2013). As mentioned in the Readiness Preparation Proposal (R-PP), the government of Nepal is committed to developing a national REDD+ strategy compliant with the international safeguard measures of REDD+. The R-PP of Nepal has proposed to

adopt multiple safeguard measures: Strategic Environmental and Social Assessment (SESA)/ Environmental Social Management Framework (ESMF) and REDD+ Social and Environmental Standard (SES). The Structural Framework for National REDD+ Strategy has recommended to develop a safeguard system as an integral part of the national REDD+ strategy (REDD Cell, 2013). The SESA/ESMF process aims to identify potential negative impacts of REDD+ and develop a strategy in order to respond to the impacts through ESMF. The REDD+ SES relates to the safeguards-related performance assessment of REDD+ policy and program at a national level.

Harmonization of these processes and principles with UNFCCC decisions, including the Cancun Agreement and the international instrument of indigenous peoples' rights, is crucial to building a country safeguards system in Nepal. The major steps taken towards safeguards in REDD+ are mentioned briefly in the following section.

### Strategic Environmental and Social Assessment (SESA) and Environmental and Social Management Framework (ESMF)

The government of Nepal recently completed an initial process of Strategic Environmental and Social Assessment (SESA) that identified the potential impacts of REDD+ activities in Nepal. SESA has recommended fourteen strategic options to address these impacts (Box 3: SESA strategic option). Indigenous peoples and stakeholders commented that the government failed to build synergy between SESA and the National REDD+ strategy formulation process. SESA options are supposed to arise from the assessment of National REDD+ Strategy, meaning that the National REDD+ strategy has to be developed before SESA. Contrary, SESA options are identified prior to the development of National REDD+ strategy. The National REDD+ strategy is still in the process of development.

### REDD+ Social Environmental Standard (SES)

In RPP, Nepal has proposed to apply REDD+ Social and Environmental Standard (SES) for the safeguards-related performance assessment in the country. The country specific indicators of the standard are developed. The national assessment of REDD+ program, based on these indicators, will have to reflect the status of safeguards implementation in the country. The Structural Framework for National REDD+ Strategy has proposed

to develop a separate section on safeguards and emphasized the inclusion of non-carbon benefits and a safeguards information system under the national forest monitoring system in the national REDD strategy. It strongly recommends maintaining consistency with Nepal's country safeguards system of REDD+ and with Cancun safeguards decided by UNFCCC COP 16. The REDD+ SES process of Nepal is yet to reach the "monitoring plan", and "national assessment report" stages so as to reflect the situation of safeguards in the country.

### Political commitment

The political parties of Nepal have expressed their commitment in the political manifestos during the election of the Constitutional Assembly to develop safeguard measures. The Natural resources committee of the Constituent Assembly recommended to incorporate the rights of citizens to adaptation as a fundamental right in the new constitution. Despite all these positive political commitments, there are still uncertainties about the constitutional framework for safeguards measures for climate change adaptation and mitigation in Nepal.

### Institutional arrangement

In spite of the significance of state responsiveness in the promotion and implementation of safeguards in climate change-related policy and programs, Nepal lacks specific institutional arrangement for the safeguards. On the other hand, overlapping of jurisdictions and weak performance of government at the national, district and local levels, is a common challenge in the process of safeguards implementation in the country.

Following is a list of institutions set for safeguarding social and environmental issues in the formulation, implementation and monitoring of climate change policy and programs in Nepal.

### Climate Change Council

Climate Change Policy (2011) has envisioned a Climate Change Council in order for it to coordinate climate change-related activities in Nepal. This policy recommends to establish a Climate Change Center for conducting research and development of climate change adaptation activities. But the policy does not explain the governance and administrative structure of the center, so it is not clear what kind of center will be established and

who will operate it. The Climate Change Council has not developed a specific strategy on safeguards for the most vulnerable groups of people. The institutional architecture of the council does not include indigenous peoples and local communities at a decision making level.

### Multi-Stakeholders Climate Change Initiatives Coordination Committee (MCCICC)

Multi-stakeholders Climate Change Initiatives Coordination Committee (MCCICC) is a major decision-making body for NAPA implementation. But there is no representation of indigenous peoples in MCCICC. Indigenous peoples' leaders argue that without ensuring representation and participation of indigenous peoples and local communities in ICCMCC, the adaptation program will not benefit indigenous peoples. They claim that indigenous peoples are the rightful managers and owners of natural resources in their territories, so they should be active participants in the decision making process of MCCICC.

### Alternative Energy Promotion Centre (AEPC)

Alternative Energy Promotion Centre (AEPC) is a semi-governmental agency responsible for the implementation of the government's alternative energy promotion program. The alternative energy policy and program are not favourable to the poor and marginalized groups due to an underrepresenation of indigenous peoples and local communities in the institutional mechanism of this center. AEPC has focused on micro-hydro and commercial enterprises but ignores the traditional knowledge, skill, experiences, and technologies of indigenous peoples' which can be very sustainable for local development including the energy sector. The practices of the center are not consistent with the CBD 8 (j) and UNDRIP, where the traditional knowledge of indigenous peoples is recognized and described as "…the manifestations of indigenous peoples' sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts" (UN Declaration on the Rights of Indigenous Peoples).

### REDD+ Apex Body and REDD+ Working Group

R-PP of Nepal has envisioned the formation of a REDD+ Apex Body as a policy level decision making body and REDD Working Group as a major working body for REDD+ related activities. The majority (85%) of the

total 13 members of the REDD+Working Group are from government and donor communities that challenge indigenous peoples and local communities to voice their opinion in the Working Group and also to generate critical knowledge and provide constructive inputs. Woman representatives and *Dalits* are completely missing from the Working Group. There is no initiative for increasing the number of representatives of indigenous peoples and of civil society, which results in a poor decision making process.

On the basis of the Warsaw decision on REDD+, the government has assigned the Ministry of Forest and Soil Conservation (MoFSC) as a national entity to work for the REDD+ activities, but a country-wide safeguards system for REDD+ is yet to be put in place by REDD Implementation Centre.

### District Energy and Environment Unit and District Disaster Risk Reduction Committees

The District Energy and Environment Unit and District Disaster Risk Reduction Committee are responsible for the formulation, implementation and monitoring of climate change adaption actions at the district level. Due to the irregularity of the periodic election of local governments, accountability and effectiveness of this unit and committee in addressing relevant activities is weakening. On the other hand, these mechanisms are led by representatives of the local government bodies and line agencies having limited representation of indigenous peoples and local communities. The R-PP and Structural Framework for National REDD+ Strategy has recommended to strengthen the role of District Forestry Sector Coordination Committee (DFSCC) in the implementation of REDD+ activities at the district level. District Coordination Councils (DCCs) of the Nepal Federation of Indigenous Nationalities (NEFIN) and districts chapter of the Federation of Community Forestry Users Nepal (FECOFUN) criticize the institutional mechanism of DFSCC. They argue that this committee does not ensure a meaningful participation of indigenous peoples and local communities in it. There are calls to reform this committee to create a more inclusive structure at the district level. At the same time, the capacity building of indigenous peoples and civil society groups is critically linked to safeguard issues, because without awareness, people are not able to take part in any actions and safeguard implementation.

## Compliance system

Information systems and grievance redress mechanisms are an important component of the safeguards compliance system. A clear assessment with a defined set of indicators is required to provide information about the country situation on safeguards. So far, Nepal lacks specific indicators for the safeguard performance assessment in the climate change policy (2011), NAPA and LAPA. In the context of REDD+, some indicators for the overall performance assessment of REDD+ program are developed, and safeguards-specific indicators are also developed based on the REDD+ SES guideline, which has not been implemented. Nepal has yet to develop the Safeguard Information System (SIS) for REDD+ as required by the UNFCCC COP 17 and 19 decision.

In summary, Nepal needs to review the existing grievance redress mechanisms for both formal statutory and customary institutions, so that the traditional and customary grievance redress mechanism becomes more accessible, inclusive, transparent and effective at a local level.

## Indigenous peoples as actors in safeguard milieu

Indigenous peoples have a collective existence and, therefore, rely on each other for their survival and prosperity (AIPP 2012). They hold a common world-view with a distinct identity of their 'indigenoushood'. Contrary to this fact about indigenous peoples, ever since the industrial revolution in Europe during the 18th century, development initiatives and natural resources related policies concentrated on economic growth and neglected the social and cultural assets of human beings, particularly of indigenous peoples. In a similar way, after the end of World War II in 1945, the concept of 'development' emerged and spread rapidly around the globe. But the development approach was unidimensional leading to the assimilation of multiple lifeways and cultures of indigenous peoples into the so-called universal development ladder of living standards. These matters adversely impacted indigenous peoples' livelihoods and the culture as a whole. Even today, indigenous values, skills, knowledge, customary law, and collective ownership of the ancestral land and territories of indigenous peoples are ignored[2] by forming discriminatory laws for countries.

Bhattachan (2009) states that the first Law of the Land, Muluki Ain 1854 of Nepal, was immensely discriminatory towards indigenous peoples.

Despite the fact that indigenous peoples never belonged to the caste system and hierarchy, the Muluki Ain 1854 legally placed indigenous peoples in the lower hierarchy of the caste system. According to the law, the justice system and the social, political and economic opportunities were offered based on the caste hierarchy that someone belongs to. Later in 1963, the caste-based discrimination was legally abolished. Nevertheless, multiple ways of exclusion and deprivation of indigenous peoples and some other groups continued as the discriminatory practices were deeply rooted in society. The operation of the unjust system of the state resulted in massive violations of the rights of indigenous peoples. For instance, the cultural and symbiotic relationship of indigenous peoples with the natural resources, forests, land and territories was never recognized. Rather, the system forced indigenous peoples to follow the Hindu caste system in all the social and cultural activities including nature worshiping.

Recently, development activities and new policy initiatives (climate change policies, for instance) continue to take their toll. Interviews with indigenous leaders show that these new policies and programs are still impacting indigenous peoples in one way or another. Expression of informants shows that multiple layers of inequality, political marginalization, economic deprivation, and cultural and symbiotic devaluation are common experiences in the indigenous world. These experiences indicate that the new plans, programs, projects, policies and laws have had negative impacts on indigenous peoples' distinct relationship with forests, land, territories and natural resources. Indigenous peoples have repeatedly urged the international community and the States to safeguard the negative impacts of policies and programs on indigenous peoples' health, traditional healing practices, territorial integrity, collective identity, ancestral domain, cultural integrity, livelihoods, customary practices and law, knowledge system, skills, social cohesion and well being, among others[3]. Alongside these historical challenges to indigenous peoples, decade-long discourses and efforts conceived as 'safeguard measures' based on different principles, indicators and international legal instruments.

## Basics of the safeguard measures for indigenous peoples

Indigenous peoples across the globe have a strong opinion about themselves as the rightful owners and custodians of the natural resources and other matters related to indigenous peoples (IIPFCC, 2013). The International Indigenous Peoples Forum on Climate Change has made

several interventions during the intersession and the Conference of Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC). The intervention statements urge Member States to ensure full and effective participation of indigenous peoples and to take into account[4] the collective rights of indigenous peoples on forests, land, territories and resources in line with international standards and instruments.

IIPFCC statements and several other documents of indigenous peoples consider Free, Prior and Informed Consent (FPIC) as a fundamental measure of the environmental and social safeguards (NEFIN, 2014). FPIC is described as a "right" of indigenous peoples to exercise their collective rights over natural resources (A/HRC/18/42, para.63. August 17, 2011). It is also described as a "principle" to acquire substantive aspects of human rights. "These (FPIC) include the rights to: property, participation, non-discrimination, self determination, culture, food, health, and freedom against forced relocation" (UN-REDD, 2013). UN-REDD reiterates the fact that international law has recognized FPIC as a legal norm imposing clear affirmation of duties and obligations on States. The Legal companion to the UN-RED Program guidelines on FPIC (2013) clearly asserts that the States have a duty and obligation to seek FPIC and ensure FPIC as a safeguard to any negative impacts of an intervention in the community. Indeed, FPIC is a derivative of the essential facets of human rights. For example, the United Nations Declaration on the Rights of Indigenous peoples (UNDRIP) contains the mechanisms and processes regarding respect of indigenous peoples' rights to land, territories, resources, ancestral domain, their rights to self-determination and to cultural integrity [Article 10, Article 11 (2), Article 19, Article 26 (1), Article 26 (2), Article 28 (1), Article 29 (2), and Article 32 (2)][5]. International Labour Organization's Convention on Indigenous and Tribal Peoples (ILO C 169)'s Article 14 (1), Article 15 (1), and Article 16 (2) explain the same rights[6]. ILO C. 169 precisely explains that whenever consideration is being given to legislative or administrative measures which may affect indigenous peoples, they must be consulted and the consultation has to be undertaken in good faith and in a form appropriate to the circumstances with the objective of achieving consent. Likewise, the Convention on Biological Diversity (1992) Article 8 (j) mentions that the States and parties should have the duty and obligation to ensure that FPIC has access to traditional knowledge, innovation and practices of indigenous peoples.

Other UN human rights committees of international instruments of human rights, such as International Convention on the Elimination of All Forms of Racial Discrimination (CERD) (1965), International Convention on Economic, Social and Cultural Rights (ICESCR) (1966) and the International Convention on Civil and Political Rights (ICCPR)(1976), explicitly and repeatedly affirm the duties and obligations of the States to secure consent (UN-REDD, 2013), which clearly shows FPIC as a fundamental safeguard measure in all matters including climate change initiatives impacting indigenous peoples. Indigenous peoples consider FPIC as the basis of safeguards in climate change adaptation and mitigation activities that also have to follow the processes of FPIC in every step of the implementation of climate change mitigative actions.

## Essence of Free Prior and Informed Consent (FPIC)

The four different elements, 'Free', 'Prior', 'Informed' and 'Consent', carry an integral and substantial meaning of the whole principle of FPIC. Each of these terms has its own meaning, principles and processes of implementation. AIPP (2012) mentions that the principle and the substance of each element of FPIC are interrelated and should not be treated separately. The term 'Free' means the independent process of decision-making. 'Prior' refers to the right of indigenous peoples to follow their own decision-making process for any conduct prior to the implementation of any program or project. 'Informed' refers to the right to have accurate, accessible, sufficient and culture-friendly information on matters for the decision-making process. 'Consent' is a collective and independent decision of affected indigenous peoples after following their own process of decision-making. The first three elements (Free, Prior and Informed) qualify and set the conditions of 'consent' as a decision-making process. Therefore, 'consent' is required before any action takes place (Prior), independently decided (Free), and based on accurate and sufficient information (Informed) for it to be a valid outcome of a collective decision. Most importantly, the processes in each of these steps of FPIC should be fair and of good faith. Its implementation requires a framework of upholding the collective rights of indigenous peoples. Therefore, the aspiration of FPIC is significant in order for them to ensure meaningful and effective participation in the decision-making process of climate change related activities. Indeed, FPIC ensures mutual respect and dignity of indigenous peoples, among others, rather than to confront any actors of climate change adaptation and mitigation.[7]

According to the interviews with indigenous peoples, there is consensus that FPIC should be implemented as a safeguard in climate change interventions, including policy formulations and/or adoption of legislative and administrative decisions that directly and/or indirectly affect them[8]. So the conducting FPIC allows indigenous peoples to exercise their collective rights and control over their ancestral domain and the respect towards their cultural integrity and self-determination, especially when it comes to their own development as distinct peoples (Hill et al., 2010).

In order to respect diverse and peculiar ways of living and the collective rights of indigenous peoples, any external entity and or actor of climate change such as the government, corporations, institutions, organizations and project proponents, need to seek an agreement, authorization and consent with/from indigenous peoples, as they are the rights holders of local natural resources (UN-REDD 2013). All of the above provisions show FPIC is inevitable and also a collective undertaking of indigenous peoples so that they get involved in the collective decision-making processes. Nepal, as a party to the UNDRIP, ILO C 169, UNFCCC and other relevant international instruments, is obliged to apply FPIC in any matter including climate change mitigation and adaptation actions, including REDD+.

## Application of FPIC in REDD+

The COP 16 of the UNFCCC held in Cancun, Mexico in 2010 agreed upon the 7-point safeguard measures in order to adopt REDD+ as a means to mitigate climate change impact by preventing deforestation and forest degradation and conserving forests and biodiversity, with no negative impact on indigenous peoples and forest-dependent communities[9]. "Respect for the knowledge and the rights of indigenous peoples and members of local communities" and ensuring "full and effective participation of relevant stakeholders, inter alia, indigenous peoples and local communities" represents the essence of FPIC [Cancun Agreements, para.69, 72; and Appendix I, paras (a), (c) and (d)]. As agreed on the set of 'safeguards', Parties are obliged to implement the agreed safeguards (international instruments of human rights), including FPIC, in climate change policies and programs.

Later, in COP 17 (2011) held in Durban (the UNFCCC secretariat), parties also agreed to develop a Safeguard Information System (SIS) in all REDD+ countries to provide information on how these social

and environmental safeguards are being addressed and respected in the REDD+ activities. The Subsidiary Body for Scientific and Technical Advice (SBSTA) under UNFCCC is requested to develop guidelines on SIS to agree upon, which was later endorsed by COP 19 in Warsaw. An important implication of these agreements is the recognition of UNDRIP, including FPIC in REDD+ activities. These agreements and decisions illustrate that international negotiation on climate change and REDD+ have adopted safeguards and FPIC together. COP 19 agreements on non-carbon benefits, complements the safeguard in REDD+. In line with the UNFCCC agreement, the major Delivery Partners (DPs) and the trustees of Forest Carbon Partnership Facility (FCPF) of the World Bank and United Nations' REDD Programme (UN-REDD) have safeguard policies that has to ensure FPIC compliance. Consistent with the human rights-based approach of UN agencies and programs as outlined in the UN Common Understanding on the Human Rights-Based Approach to Development Cooperation (2003) and UN Development Group Guideline on Indigenous Peoples Issues (2008) which are based on the international instrument of human rights, REDD+ activities has to implement FPIC at all local, national and global levels.

## Conclusion

REDD+ countries have to develop their own country safeguards system for climate change adaptation and mitigation policy and program in order to minimize the potential negative impacts on society and the environment. The safeguards system development process should be based on full and effective participation of stakeholders including indigenous peoples, and local communities. The overarching framework for the development of country safeguards system and safeguard information system needs to be consistent with the UNFCCC decision on safeguards and other international instruments of human rights.

Indigenous peoples, as one of the actors and beneficiary of safeguards in climate change mitigation and adaptation, must have full and effective participation in the process of development and implementation of relevant activities. FPIC is recommended as the basis of safeguard measures of climate change mitigation and adaptation intervention in the country. Concisely, REDD+ countries have the responsibility and obligation to put in place safeguards that ultimately foster social justice, social inclusion and cohesion in climate change resilient communities and in the country.

Endnotes

1 Interview with NEFIN District Coordination Committee, Ilam

2 Interview with NEFIN District Coordination Committee

3 International Indigenous Peoples' Forum on Climate Change

4 http://www.awid.org/eng/News-Analysis/Announcements2/COP19-Statement-of-International-Indigenous-Peoples-Forum-on-Climate-Change-Statement-IIPFCC-High-Level-Segment (August 1, 2014)

5 United Nations Declaration on the Rights of Indigenous peoples Adopted by General Assembly Resolution 61/295 on September 13, 2007

6 ILO Convention 169, entered into force on September 5, 1991

7 Interview with the Indigenous leaders in July 14,2014

8 Interview with NFIN District Coordination Committee members in July 15-16, 2014

9 Cancun Agreements, para.69,72; and Appendix I, paras (a), (c) and (d)

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## Climate Change—Negotiations and Solutions

**Ugan Manandhar**

### The history of the negotiations

The climate change negotiations began in 1995 with the first COP being held in Berlin, Germany. The meeting opened a platform for dialogue between countries through a multilateral process to deal with climate change. This was the first effort to seek a global consensus as to how to combat climate change through research as a scientific basis and actions as a means of implementation. During the first meeting, the analytical aspect of various two-year scenarios were examined and by the second COP meeting in 1996, the Intergovernmental Panel on Climate Change (IPCC) findings revealed the need for mid-term targets on greenhouse gas reductions.

The third meeting of COP in 1997 in Japan was an historic one, with all parties agreeing on a new, legally-binding protocol, the Kyoto Protocol. The Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) was adopted in Kyoto, Japan, on 11 December 1997. In accordance with Article 24, it was open for signature from 16 March 1998 to 15 March 1999 at the United Nations Headquarters, New York. By that date the Protocol had received 84 signatures.

Pursuant to Article 22, the Protocol was subject to ratification, acceptance, approval or accession by Parties to the UNFCCC. Parties to the UNFCCC that have not signed the Protocol may accede to it at any time. The Protocol entered into force on 16th February 2005 in accordance with Article 23,

that is the ninetieth day after the date on which not less than 55 Parties to the UNFCCC, incorporating Parties included in Annex I which accounted in total for at least 55 % of the total carbon dioxide emissions for 1990 of the Parties included in Annex I, have deposited their instruments of ratification, acceptance, approval or accession (http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php).

This Protocol paved a new path for emissions reduction among annex 1 parties or developed countries with a target of 5.2% for the period between 2008 and 2012, taking 1990 as the reference period or base year. The other groups of countries—the developing countries were known as the non-annex 1 parties. This was the first step in the negotiations that brought to the table the likelihood of finding a solution to the climate crisis. However, there were also mixed views in terms of the ambition and the scale of the effort required to resolve the climate crisis.

The discussions at this point turned to the implementation of the Kyoto Protocol (KP). The Buenos Aires Plan of Action presented at the fourth COP in 1998 outlined the implementation of the Protocol. It was not until the sixth COP in 2000 at the Hague, Netherlands, that the discussion of carbon offsetting as a means to implement the KP, emerged. Following the suspension of COP six due to disagreements about the concepts and ideas of carbon offsetting, the meeting resumed in Bonn, Germany, which resulted in an agreement about a number of flexible mechanisms as possible solutions to deal with the climate crisis.

The three flexible mechanisms proposed were; the joint implementation (JI); emission trading schemes (ETS); and the clean development mechanism (CDM). Discussions amongst the parties continued in an effort to find a solution to climate change without much success. Emissions started peaking and the target needed to minimize the impacts of climate change started to rise while the ambition to reach a consensus seemed weaker than ever.

The seventh COP in Marrakech, Morocco, in 2001 began with discussions and negotiations about emission trading rules, accounting and compliance mechanisms for carbon offsetting. During the next three meetings in 2002, 2003 and 2004 in New Delhi, India, Milan, Italy and Buenos Aires, Argentina, respectively, the negotiations showed little hope in raising the emission reduction targets.

The negotiations took another, serious, turn for the worse in 2004 when the USA backed out of the Kyoto Protocol and renounced its ratification. This unexpected move prompted the UNFCCC to start a different process for parties that were signatory to the Protocol and for those that were not. This division resulted in parallel process known as COP MOP (Conference of Parties serving as the Meeting of Parties) or CMP for short.

The first CMP meeting took place in 2005 parallel to the eleventh COP meeting in Montreal, Canada, deliberating on how to extend the Kyoto Protocol followed by the second meeting in Nairobi, Kenya during which the Nairobi Work Programme was presented, focusing on best practices for adaptation. The negotiations to curb GHG emissions were not moving in a favorable direction until the thirteenth COP and CMP three in Bali, Indonesia where the parties agreed to generate specific outcomes by the fifteenth COP and fifth CMP in COPenhagen, Denmark. The fifteenth COP and fifth CMP was historic as it saw 120 Heads of States attending, the highest turnout of the number of participants at the highest representation level. The process, which was supposed to result in a deal to save the planet, was exclusive and plagued by a lack of transparency. The result was a USD 30 billion pledge by the developed countries as initial financing until 2012 followed by USD 100 billion until 2020 from which point USD 100 billion would be pledged annually.

The multilateral process had nearly seen its demise, but at the sixteenth COP in 2010 in Cancun, Mexico, the process regained its integrity and brought the negotiations back on track under an agreement on a framework (Cancun Framework) to continue to move the process forward. Despite the renewed trust, negotiations remained tentative until the seventeenth COP held in Durban, South Africa in 2011, where all parties agreed to a single, legally-binding agreement in 2015 in Paris, France applicable to all parties beginning in 2020. The roadmap to reach this agreement would be discussed under the Ad hoc Working Group under the Durban Platform (ADP) starting at the eighteenth COP in Doha, Qatar and ending at the twenty-first COP in Paris, France.

With the closing of the seventh COP and seventh CMP, the outstanding issue was still the extension of the Kyoto Protocol for another period.

The eighteenth COP and eighth CMP, held in Doha, Qatar, started with the parties still divided on the extension of the Protocol. Developing

countries wanted an extension of the Protocol while the developed countries did not. The developing countries took a strong stance for the extension of the Protocol as that was the only legally-binding instrument to curb emissions from developed countries. An agreement was finally reached under the Doha Climate Gateway to extend the duration of the Protocol for an additional period of eight years starting from 1st January, 2013 until 31st December 2020. Even with this positive outcome, financing was still a key factor to the implementation of the major decisions of the past COPs.

The parties had envisioned a financing body under the COP known as the Green Climate Fund (GCF) to provide funding for all issues under the COP that were spearheaded by the UNFCCC as the secretariat. Unfortunately, despite agreeing to create the GCF and base it in South Korea, it remains unimplemented to this date.

The nineteenth COP and ninth CMP was tagged as the finance COP where it was believed that developed countries would pledge mid and long term financing. Financing was indeed pledged at the nineteenth COP; however the GCF continues to remain empty while the levels of funding continue to increase for selected countries outside the UNFCCC process.

Less than a year remains with little clarity as to how the negotiations will result in the curbing of greenhouse gases through a legally-binding deal to be reached in 2015. Given the current state of negotiations, and discussions under the ADP (Ad hoc Working Group under the Durban Platform), countries are re-negotiating and reinventing the wheel by repeatedly deliberating on the same issues.

The discussions in Lima, Peru to be held in November/December 2014 are expected to create the roadmap for a global deal in 2015.

## Assessment approach

This study assesses the history of the negotiation process both through participation in the UNFCCC and review of documents available in the UNFCCC website and other published literatures, bringing into light the various tools, techniques, concepts, plans, institutions and financial mechanism developed in the last two decades in the UNFCCC to help combat climate change. This assessment looks into the results produced from the negotiation process to help solve the climate crisis.

## Results of the negotiations to bring solutions

Through the UNFCCC negotiations, member countries have sought solutions in terms of tools, techniques and processes, institutional structures and the financial mechanisms under them, both to address mitigation and adaptation needs and identify sources of funding and required technology and capacity building needs. Some of the solutions dealing with the impacts of climate change are discussed here.

### A. Tools, Techniques and Processes

### a. Flexible mechanisms

It was under the Kyoto Protocol that three flexible mechanisms were considered as options to help reduce the emissions of greenhouse gases. They were:

- Joint Implementation (JI)
- Emissions Trading Scheme (ETS) and
- Clean Development Mechanism (CDM).

Under the first option, two developed countries pool their resources to reduce emissions and the net emission reductions are shared amongst them based on the effort and resources shared. Under the second option, one developed country with excess emissions could sell the excess to the other developed country. Under the third option, a developing country contributing to emission reductions can be sold to a developed country.

The overall implementation of the flexible mechanism is done through the carbon trading systems via carbon markets and the funds generated are known as carbon finance.

The carbon markets do have some potential to help reduce GHG gases. With the emissions reduced, the carbon trade also contributes to sustainable development by promoting alternate energy and energy-efficient technologies.

The carbon market, however, has not been a great success mainly because the USA, where the demand for carbon trading is potentially very high, disassociated itself with the Kyoto Protocol.

### b. NAPA—National Adaptation Programme of Actions

The National Adaptation Programme of Actions (NAPAs) was specifically meant for Least Developed Countries (LDCs). The NAPAs basically

outline the key sectors that are impacted by climate change in LDCs and identify projects that need to be implemented to address the most urgent and immediate needs. All 49 countries have submitted their NAPAs to the UNFCCC, but the bottleneck lies in the lack of funding sought from LDCs to implement the NAPAs. Limited funding is available to LDCs to implement their NAPAs through leveraging of the UNFCCC and some outside the processes. The LDCs have thus initiated some adaptation actions on the ground to benefit vulnerable local communities.

### c. Saving Forests through REDD+ (Reducing Emissions from Deforestation and Forest Degradation in Developing Countries)

The discussion to save forests emerged within the UNFCCC stemmed from the limited success of the afforestation and reforestation projects under the CDM. This time the discussions targeted natural forests and started with RED (Reducing Emission from Deforestation in developing countries) at COP seven in 2001 in Marrakech, Morocco.

Following much debate and discussions, the topic moved from RED to REDD (Reducing Emission from Deforestation and Forest Degradation) and finally the negotiations concluded by deciding on REDD+ at COP15 in Copenhagen, Denmark in 2009.

REDD+ stands for Reducing Emission from Deforestation and Forest Degradation in developing countries and the "+" means conservation of carbon stock. The sustainable management of forest and enhancement of forest carbon stock includes five activities namely, reducing deforestation, reducing forest degradation, conserving forests, sustainably managing forests and enhancing forest cover and carbon stocks.

REDD+ is based on voluntary participation from developing countries wanting to conserve forests. Volunteer developing countries would receive results-based payments (prices have not yet been decided) per ton of $CO_2$ equivalent from the forests saved.

The participating countries have to measure, monitor, report, and verify the quantity of GHGs from the forests accounted for to receive the results-based payments. The forest cover accounted for under the REDD+ mechanism could be delineated at either a sub-national or national scale for participation in REDD+.

REDD+ is assumed to be an economic model or solution to saving the natural forests, enhancing forest coverage and helping to maintain a global balance of GHGs in the atmosphere.

Developing countries also need to consider the technical, legal and socio-environmental issues when participating in REDD+, with some of those issues being:

i) Establishing a National Forest Monitoring System that will maintain and monitor all the required information of the forestry sector of the participating country for implementing REDD+ using appropriate tools and techniques.

ii) Establishing an MRV (Measuring, Reporting and Verification) mechanism that will look into measuring, reporting and verifying carbon stocks from the forests delineated for REDD+ participation.

iii) Establishing a reference emission level from the project boundary so as to serve as a basis to claim performance based payments.

iv) Addressing the drivers of deforestation and forest degradation to help reduce emissions from the usual business sectors.

v) Ensuring safeguards so that the rights of local communities and indigenous peoples' access to the forest are not violated and unfriendly environment practices are not encouraged.

vi) Analyzing non-carbon benefits in terms of the services the forests provide and support biodiversity.

vii) Financing REDD+ readiness and demonstration so as to achieve results-based payments.

### d. NAP—National Adaptation Plans

The National Adaptation Program of Actions (NAPAs) focuses on short and urgent adaptation needs of LDCs. NAPAs captured certain areas where adaptation interventions were immediately needed and resources required but failed to capture mid and long-term adaptation requirements for those countries.

National Adaptation Plans (NAPs) are an opportunity for LDCs to build on the NAPAs and mainstream adaptation planning and implementation across all sectors for both mid and long-term plans.

A set of technical guidelines were also agreed to by the parties to support LDCs in the preparation of NAPs. NAPs are not just limited to least developed countries but are applicable to all developing countries.

Adapting to climate change is crucial for both least developed and developing countries. All developing and least developed countries need to ensure that equal and adequate resources are available for adaptation planning and implementation such as mitigation.

Experiences from NAPA show that funding was made available for the preparation of NAPAs but there were limited resources for LDCs to implement them. NAPAs have become a shelved document for many LD countries and there is much hesitation by developing countries to pursue the evolved NAPs due to limited support to fund the implementation of NAPAs by developed countries. That being said, and with agreement regarding the technical guidelines, there is an opportunity for LD and developing countries to test the guidelines and engage in the process of formulating NAPs to mainstream adaptation planning across all sectors and development plans.

### e. NAMA—Nationally Appropriate Mitigation Actions

As with adaptation, deliberations also looked into opportunities for mitigation. Mitigation actions were expected to be much more ambitious from developed countries, with a lower level of engagement from developing countries.

Thus, developing countries, including LDCs (voluntarily), were provided the opportunity to develop NAMAs so as to identify nationally appropriate actions to deal with mitigation. NAMAs looked into mitigation scenarios from various nationally appropriate sectors. The sectors could be decided based on the results from the national communications report in order to look into appropriate actions to reduce the potential emissions.

The deliberations around NAMA have led to discussions around low carbon development and a green economy, looking into sectors including energy, buildings, transportation, cleaner fuels, forestry and land use. The political debate framed around NAMAs is actually converting the actions into quantifiable commitments from developing countries and further driving the negotiations of supported versus non-supported NAMAs. While the position of the developed countries is that if they support the development of NAMAs, the developing countries must in turn also commit and report emission reductions, the developing countries are reluctant to commit and prefer non-supported NAMAs. Developing countries want to take actions that are nationally appropriate and refuse to voluntarily commit or report the outcomes. Nevertheless, many developing countries and LDCs have

initiated and incorporated the low carbon development pathways in their development plans.

### f. Loss and damage

A contentious issue in the climate change negotiations has been the loss and damage beyond adaptation, occurring due to climate change and its consequences. The developing and least developed countries have struggled to establish a global mechanism to address the issue of loss and damage occurring due to climate change, and provide necessary compensation. On the other hand, since not all losses and damages occurring as a result of natural hazards can be attributed to climate change, the political debate centers around (i) up to what scale can such a mechanism be responsible for and (ii) how is it to possible to value the damages even if one was to initiate an insurance mechanism? Another concern is, are developed countries, even willing to pay the premiums?

Following a prolonged debate, a process has been established to address loss and damage; however the discussions on establishing a global mechanism are still ongoing with a decision due in COP 22, in 2016. The discussions on loss and damages instigates the importance of DRR (Disaster Risk Reduction) strategies, as in the future, the frequency of climatic hazards will increase, the timing of events will be less predictable, and the magnitude will likely also increase. The negotiations will proceed, but countries must prepare now for the worst case scenarios in order to save people and property.

### g. Technology transfer

Developed countries are far more technologically advanced and the negotiations call for a transfer of technology across developing countries to address mitigation measures and facilitate the implementation of adaptation actions. However, the issue of intellectual property rights (IPR) has been a major hindrance in the process of technology transfer.

From a business and economic perspective, a network and committee to facilitate technology sharing, should be created. Negotiations for technology transfer aside, there are also calls for the integration of indigenous, nationally-appropriate technologies that have been and can be still be used before they vanish.

Countries should not wait and rely only on the transfer of technology, but also build on their own local knowledge and expertise. Required

technology transfers should be made available to developing and least developed countries at a mutually affordable price.

### h. Capacity building

With the various opportunities that have resulted from negotiations, capacity building is one of the key solutions to saving the planet. The trend in climate change negotiations is that only a handful of countries benefit and the LDCs are always the least and the last to benefit but usually the first ones vulnerable to the impacts of climate change.

Furthermore, LDCs have a relatively limited capacity to understand and negotiate for their safe future, let alone benefit from problem solving processes. Capacity building is considered one of the corner stones of the solution to the climate crisis and thus a Capacity Building Forum has been established to address the need for this.

Least developed countries primarily need to voice their issues regarding capacity development by identifying specific needs to enhance their capacity to ensure a safer future and play an active role in the global initiative to explore solutions for a safer planet.

### (i) INDC—Intended Nationally determined Contributions

With limited progress on ambitious targets, a new approach to deal with mitigation targets is now INDCs. The initial thinking was that INDCs would be focused on mitigation targets for both developing and developed country parties, but the discourse of the discussions is now moving towards other issues such as adaptation, technology transfer, and finance. The upcoming intersessions prior to the twenty first COP in Paris will pave the discourse of INDCs and its content from both developed and developing country parties.

## B. Institutional arrangements

The UNFCCC has brought many processes which have paved the way for solutions to address climate change. It is important to enact these solutions with appropriate institutional arrangements for the effective and efficient delivery of the programs that address climate change for the benefit of all nations. The UNFCCC negotiation process has institutionalized various arrangements to serve the outcomes of the party-driven process and to provide guidance where and whenever necessary.

Some of the key institutional arrangements that have helped to steer the

decisions that have resulted from the negotiations are as follows:

**a.** AFB: Adaptation Fund Board

**b.** AC: Adaptation Committee

**c.** TEC: Technological Executive Committee

**d.** CTN: Centre for Technology Network

**e.** CEB: CDM (Clean Development Mechanism) Executive Board

**f.** LEG: LDC Expert Group

## C. Financing mechanism

Financing constitutes a key part in implementing the UNFCCC Conventions. The Conventions have identified streams of financing so that the parties can have access to the resources necessary to deal with the impacts of climate change. Currently, the key financing institutions under the UNFCCC to help implement the Convention are:

**a.** Special Climate Change Fund (SCCF)

**b.** LDC Fund (LDCF)

**c.** Adaptation Fund

**d.** Green Climate Fund

### a. Special Climate Change Fund

The Special Climate Change Fund (SCCF) was established under the Convention in 2001 to finance projects relating to: adaptation; technology transfer and capacity building; energy, transport, industry, agriculture, forestry and waste management; and economic diversification. This fund should complement other funding mechanisms for the implementation of the Convention. The Global Environment Facility (GEF), as an operating entity of the financial mechanism, has been entrusted to operate the SCCF. In 2004, the GEF Council approved a programming document, which provides the operational basis for funding activities under the SCCF.

### b. LDC fund

The Least Developed Countries Fund (LDCF) was established to support a work programme to assist Least Developed Country Parties (LDCs) carry out, inter alia, the preparation and implementation of national adaptation programmes of action (NAPAs).

The Global Environment Facility (GEF), as an operating entity of the

financial mechanism of the Convention, has been entrusted to operate this Fund through decision 27/CP.7.

The Conference of the Parties (COP), at its eleventh session, agreed on provisions to operationalize the LDCF to support the implementation of NAPAs, providing guidance with regards to priority areas, and provisions on full-cost funding and a co-financing scale (Decision 3/CP.11).

### c. Adaptation fund

The Adaptation Fund was established in 2001 to finance concrete adaptation projects and programmes in developing country Parties to the Kyoto Protocol that are particularly vulnerable to the adverse effects of climate change.

The Adaptation Fund is financed with a share of proceeds from the clean development mechanism (CDM) project activities and other sources of funding. The share of proceeds amounts to two per cent of the certified emission reductions (CERs) issued for a CDM project activity.

The Adaptation Fund is supervised and managed by the Adaptation Fund Board (AFB). The AFB meets twice a year and is composed of 16 members and 16 alternates.

Upon request at CMP eight, the secretariat prepared a technical paper on the process of selecting host institutions for entities under the Convention and the wider United Nations system. It was based on the experiences of bodies under the Convention and the wider United Nations system. The document includes the steps and time frames required to conduct open and competitive bidding processes, for consideration by SBI 38.

At CMP eight, the Parties decided that for the second commitment period, the Adaptation Fund shall be further augmented through a two per cent share of the proceeds levied on the first international transfers of AAUs. It also decided on the issuance of Emission Reduction Units (ERUs) for Article six projects immediately upon the conversion of Assigned Amount Units (AAUs) or Removal Units (RMUs) to ERUs previously held by Parties.

### d. Green climate fund

At COP 16, Parties to decision 1/CP16, established a Green Climate Fund (GCF) as an operating entity of the financial mechanism of the Convention under Article 11. The GCF will support projects, programs, policies and other activities in the developing country of the signatory

Parties. The Fund will be governed by the GCF Board.

The assets of the GCF will be administered by a trustee only for the purpose of, and in accordance with, the relevant decisions of the GCF Board. The World Bank was invited by the COP to serve as the interim trustee of the GCF, subject to a review three years after operationalization of the Fund. The COP also decided that an independent secretariat will support the operations of the Fund. It was further decided that the GCF is to be designed by the Transitional Committee (TC).

COP 19 stressed the need to achieve full operationalization of the GCF. It urged the Board to finalize, as soon as possible, the essential requirements to receive, manage, program, and disburse financial resources. This will facilitate the GCF to commence its initial resources mobilization process as soon as possible and transition subsequently to a formal replenishment process.

Participating Parties also called for generous and timely contributions by developed countries to enable the effective operationalization, including readiness and preparatory support of the GCF. The contributions should reflect the specific needs and challenges of developing countries required to address climate change in the context of preparing the initial resource mobilization process by COP 20. Furthermore, Parties underlined that the scale of the initial resource mobilization should be significant, and that financial inputs from a variety of other sources, both public and private, including alternative sources, should be promoted.

## Discussions

The UNFCCC has brought to the table issues, themes, tools, techniques, processes, institutional mechanism and financial mechanisms to help implement the ideas to help combat climate change. But sometimes many issues just get to the level of documentation and lack implementation due to lack of financial commitment from developed country parties. Moreover there is a trend of postposing the time frame set for implementation when the negotiations are a process where there is no agreement until everything is agreed upon. The negotiations process is looking towards re-inventing the wheel without the will to implement already agreed-to issues leading to the vulnerable being more vulnerable specially the poor communities, women and children, and indigenous people.

Indigenous people have been engaged in the UNFCCC process since 2000.

The **International Indigenous Peoples Forum on Climate Change (IIFPCC)** represents the indigenous people in the UNFCCC (*http://www.iwgia.org/human-rights/un-mechanisms-and-processes/un-framework-convention-on-climate-change-unfccc*) though individual countries, specific non-governmental organizations, and civil society organizations can also independently register. NEO Nepal and CEN (Clean Energy Nepal) are registered from Nepal and NEFIN (Nepal Federation of Indigenous Nationalities) is in the process of registering. In 2010 in COP 16 in Cancun, the UNFCCC, through its various decisions, has also been inclined to acknowledge the rights and knowledge of indigenous people and their traditional practices in the different solutions, institutional arrangements, and financial mechanisms set up under the convention to help address climate change. The issues of indigenous people cuts across a number of issues pertaining to climate change, however, the key decisions taken are related to:

a. Effective participation of indigenous people in the UNFCCC process and taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples in 1CP/16

b. Adopting traditional and indigenous practices for adapting to climate change in 1CP/16.

c. Ensuring effective participation of indigenous people and safeguarding their rights to access forests and forest resources when implementing REDD+ in 1/CP 16.

With climate change, the need is plentiful for both adaptation and mitigation but resources are limited. It is time to think innovatively to capitalize on issue of how one country can contribute to really help solve this problem in any way possible. Even after twenty years of negotiations there appears to be little progress to strike a legally binding deal.

## Conclusion

Had it not been for the UNFCCC and its Convention agreed to by 196 parties, there would not have been a check and balance mechanism to deliberate and deal with the impacts of anthropogenic climate change. The swift pace of development continues to put the world's environment at stake and polluting GHG gases into the atmospheric space still continues unabated.

Policy reform, resources, technologies and capacity building have all been put on the agenda to shift the climatic balance, but the efforts are not ambitious enough and there is a distinct lack of political will. Thus there is still more to be done politically, economically and socially. The leaders of developed countries must demonstrate real initiative in spearheading environmently friendly development while curbing emissions from different sectors in their countries. Focus on a greener economy through low carbon development is an alternative for climate smart development. Moreover, mass social awareness among people across all sectors from public, private, non-governmental and civil society to influence and advocate change is also key.

The problem, though daunting, can still be tackled. The switch to one hundred percent renewable energy sources, focusing more on energy efficiency, higher energy efficient buildings, climate smart agriculture, low or zero emission transportation options, and increased use of sustainable bio-fuels, are some of the possible solutions to help solve the crisis.

It is not yet too late to take ambitious actions to bring about positive environmental change. Any further delay is going to cause more frequent, unpredictable and extreme, climate-related natural disasters. Further to this, slow on-set events such as sea-level rise, leading to loss of landmass and the melting of glaciers leading to formation of larger glacial lakes that will temporarily provide increased abundance of water but eventually result in water scarcity with the risk of glacial lake outburst floods. Furthermore, more stalling and delaying of concrete actions continuously increases the adaptation costs required to save people, ecosystems and developed structures.

Scientific reports like the IPCC (Intergovernmental Panel on Climate Change) have already reported the record high levels of $CO_2$ in the atmosphere and have predicted an exponential increase over the next decade if limited actions are taken to solve the crisis. The impacts are already being felt globally. People across the world are witnessing the worst droughts, the worst floods, the highest and lowest rainfall records, the worst heat and cold waves, and deadliest landslides as examples of the impacts of climate change. These natural phenomena adversely impact peoples' health, living traditions and cultures, resulting in loss of infrastructure, and hamper food yield and access to clean water sources. Timely and ambitious actions to combat climate change are what is desperately needed, before it is too late.

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# Coping Strategies, Mitigation and Adaptation

## Coping with Floods and Global Warming: The Case of Rolwaling Valley

**Prof. Ruedi Baumgartner**

### A growing threat

For centuries the Trakarding glacier at the Eastern end of the Rolwaling valley on the Tibetan border of the Dolakha District, was just one among countless Himalayan glaciers.[1] From the early 1990s onwards, however, the alarmingly accelerated growth of its moraine lake, the Tsho Rolpa, brought the rather remote and isolated valley into the focus of scientists and government officials, concerned with impacts of global warming (ICIMOD, 2001). Would the end moraine of the glacier be able to withstand the pressure of a water body of an estimated 70 million cubic meters? What about the impacts of a possible Glacial Lake Outburst Flood (GLOF), first on the Rolwaling community and then on downstream settlements along the Tama Koshi? In 1985, the devastating power of a flash flood from the outburst of the Dig Tsho Lake in Khumbu (Ives et al., 2010) aptly demonstrated the foreseeable fate of people living downstream. From the mid-1990s onwards, the Tsho Rolpa has, therefore, become subject to massive mitigation measures under the lead of national and international actors. This paper only briefly touches on the technical dimensions of such mitigation efforts. Instead, it addresses issues, which mainly surfaced in the course of an ongoing study of the transformation of the livelihoods of the Rolwaling Sherpas from agro-pastoralism to an intensive engagement in Himalayan mountain tourism (Baumgartner; forthcoming). The following chapter is an introduction to the Rolwaling community and their traditional habitation.

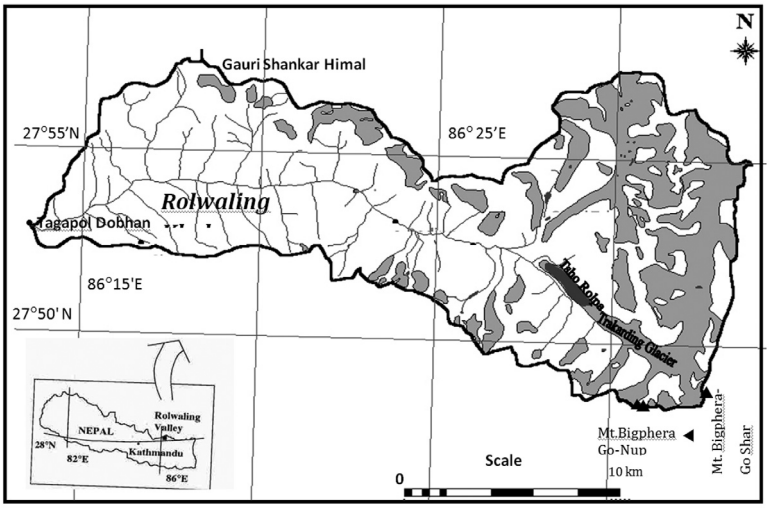



Figure 1. Map of the area with lake below Trolambao and Trakarding glacier (ICIMOD), 2009

## Rolwaling – A secluded mountain valley in transitions

Rolwaling is a traditional Sherpa habitation, similar to the neighboring Khumbu to the East of the valley. According to Sacherer (1978), the settlement history of Rolwaling dates back to the mid-nineteenth century and is the last valley settled in the long history of Sherpa migration, beginning in the 16th century. The valley stretches roughly 30 km East-West along the Tibetan border, virtually in the shadow of the Rolwaling Himal with the towering Gauri Shankar massive[2]. The striking natural beauty of the place could easily divert visitors from the question of what might have motivated Sherpa households to take up the challenge of settling in the marginality of such a harsh and remote mountain valley[3].

Based on the popular belief that Padmasambhava had meditated in the hidden valley when introducing Buddhism to Tibet, Rolwaling enshrines the prestige of being a *beyul,* created for the refuge and shelter of pious mountain dwellers[4]. Indeed, the early settlement history appears tightly related to the above belief, since the common attributes shared by the first five families and, indeed, all subsequent immigrants, are the fate of social and/or economic marginalization in their communities of origin, be it in neighbouring Tibetan districts or in Khumbu[5].

Traditionally, Rolwaling Sherpas were engaged in an agro-pastoral economy, based on seasonal transhumance and backed by a high level of social consensus regarding the sustainable management of natural resources, such as cultivable land, forests and high-pastures. In those times Beding, the main settlement of the valley, was an assembly of rather modest houses compared to the more prosperous dwellings of the Khumbu Sherpas. They clustered around an impressive Gompa, harbouring a treasure of religious paintings of the renowned artist Kapa Kalden. The narrow valley bottom and steep slopes only offered limited scope for cultivating potatoes in the range of the winter settlement of 3600 m up to the summer dwellings at 4100 m. Some high pastures invited yak grazing up to the altitude of 5400 m. A dense mountain forest, covering the entire lower north-facing valley slope, a least offered plentiful firewood and timber.

Recently, thanks to the construction of a large hydro power station at Lamobagar in the Upper Tama Koshi valley, a motorable road now links Rolwaling with Charikot, the district capital of Dolakha, from the West. Crossing into the adjoining Khumbu in the Eastern end of the valley up, even now, remains an adventurous journey over three crevassed glaciers and the 5755 m high Trashi Labtsa pass. Yet the valley had undergone fundamental socio-economic changes much before the road opened Rolwaling to the modern world of Nepal. Already in the late 1970s the community had entered into a phase of accelerated and deeply-rooted social and economic transition, after roughly a hundred years of slow and steady development without substantial external interference into village life. By the 1970s, push and pull factors began simultaneously generating social and economic change: rapidly increasing global demand for adventure tourism in the Himalaya, including expeditions, acted as a powerful pull-factor in the shape of gainful employment (Baumgartner 1980). In the same period, a disquieting push-factor in the form of an increasing imbalance between demographic growth and available natural resources for a transhumant agro-pastoral livelihood became manifest (Sacherer, 1976, pp. 167-172). By the mid-1990s, half the population of the Rolwaling community, of then roughly 300 people, had permanently settled in Kathmandu. In spite of being latecomers, compared to the Sherpa neighbours from Khumbu, Rolwaling Sherpas had meanwhile aquired a name and fame for their outstanding perfomance on expedtions. By 2010 only 20 percent of the total Rolwaling community of roughly 400

heads still resided in Rolwaling and continued to practice agro-pastoral transhumance, partly combined with running lodges in the valley.

In spite of these fundamental socio-economic changes, the Rolwaling community remains strongly attached to the valley of their origin. They not only continue to celebrate key events of the yearly cycle of social and religious festivals in the Gompa of Beding but also invest in keeping the valley alive; they care for the gompas in Beding and Na, support the new head-lama in reviving the monastery school in the valley and provide voluntary labour for community works. But all this makes them also aware of the fact that their relatives up in the Rolwaling valley live under the constant and increasing threat of a potential Glacier Lake Outburst Flood of a magnitude far beyond any previous flood events experienced by Rolwaling Sherpas.

## Facing floods

*"Alarmed by a rumbling noise, we were puzzled to see the river rushing suddenly so close along our houses in Beding and watch our whitish potatoes dancing in the muddy brown floods,"* said Ngawang Tongme, a Rolwaling farmer in his early 60s. Over the years, this image remained alive in the memories of Ngawang Tongme and his wife Purdigi. The roaring waters had alarmed the community, who was gathered in the

Figure 2: The river correction of 2007/8 pushed the Rolwaling Khola back to the former course along the slope to the left. The floodplaine has become unfit for cultivation.

village Gompa to celebrate the Dumchi festival in the summer of 1990. From the safety of the elevated terrace in front of the Gompa they helplessly witnessed the sudden destructive rage of the Rolwaling River. Figure 1 shows the still ravaged Beding plain. The flash flood of 1990/91 had breached the old embankment below the red roofed schoolhouse. The river correction of 2007 forced the Rolwaling Khola back into its original riverbed along the foot of the wooded slope to the left.

The torrential floods hit Beding on 12th July 1990 for the first time and again with renewed force a year later. They first heavily damaged and finally washed away the beautiful stone Stupa, the cherished landmark of Beding, together with roughly half a dozen old houses. The floods transformed the vast floodplain with meadows and stone-fenced potato fields at the feet of Beding village into a barren desert of sand and rubble. Once again, the disaster confirmed a local saying: "A field near the river is like having no field."

In the following monsoon seasons, the river, now gushing through the newly formed bed, repeatedly threatened homes close to the valley bottom. Whenever affected families came down to Beding from the summer settlement of Na, where they dwell during the monsoon, they took refuge in houses located higher up on the slope, which Rolwaling migrants had left vacant. In total, twelve families lost their potato fields. For Ngawang Tongme Sherpa and his wife, this loss was equal to losing a yearly harvest of 800kg of potatoes. Fortunately, the deplorable loss of some high yielding farmland did not force any of the affected families into penury, thanks to income from tourism. However, the floods carried a disquieting message for everybody; they were a forewarning of a potentially much greater disaster building up in the shape of the fast expanding glacier lake of Tsho Rolpa in the upper reaches of the valley.

## Appeasing angry local protector deities

For generations, Rolwaling Sherpas have become acquainted with the hazards of occasional leaks in glacially-fed water bodies. Already in the past, they had observed during the monsoon, how a sudden leak of one of the smaller supra-glacial lakes on the Ripimo glacier could generate a virtual cascade of bursting water-bodies, ultimately swelling into a massive flood. Such floods are locally called *chhu-bung*, meaning in Sherpa language water (*chhu*) coming at once (*bung*). The threat of a Tsho

Rolpa outburst, however, reaches far beyond the dimensions of any past experiences with flash floods. Regardless of the magnitude of the threat, Rolwaling Sherpas still believe that safety from destructive natural forces depends primarily on the grace of local protector deities residing in and around their valley[6]. These deities expect, in turn, decent human behavior and must be appeased with regular offerings. This conviction by no means prevents Rolwaling Sherpas from acknowledging the effectiveness of more worldly measures against floods and comparable natural calamities, all the more as in the past their survival also depended on their own collective engagement in physical disaster preparedness. Offering *pujas* in the Gompa and maintaining protective embankments along the river went side by side. However, even the physical measures remain firmly embedded in a socio-cultural belief system, which provides meaning and assigns responsibilities for the interaction with forces of nature.

Is such human trust in spiritual powers merely a feature of the Himalayas? Let's turn for a moment to communities in the European Alps that have lived for centuries under comparable threats of floods and ice-avalanches, originating from mighty glaciers above their homesteads. Fiesch in the Swiss Canton of Wallis became a prominent village facing such exposure. Since 1678, when Pope Innocent XI gave his consent, this community has conducted a yearly religious procession to prevent further growth of the two glaciers, Aletsch and Fiesch, that threaten the village. The community was especially afraid of an outburst of the large melt-water lake of Märjelen. In 1862, facing the peak of glacier growth, the ritual became even more rigorous.[7] Yet, since its maximum extent, the glacier has receded no less than three kilometers, causing the community great concern over losing one of their main tourist attractions. Indeed, the glaciers, a former menace, had turned into an attractive asset over the years. Concerned about the impending loss of this attraction, the community again approached the Holy See in Rome: in 2010 the late Pope Benedict XIV sanctioned a reversal of the vow and thus empowered the community to address their concern about global warming in the prayers on their yearly procession. Even more dramatic comparable historic evidence is documented from the Austrian Alps (Haid, 2008, pp.75-83). After the disastrous outburst of the Vernagtferner glacier lake in the Ötztal near Innsbruck in the year 1678, the court of the Tyrolean town of Meran accused a group of twelve people of witchcraft and executed their leader. The relationship between the impacts of climatic changes during the little ice age, (e. g. in the

form of failed harvests and natural disasters, and the frequency of such court cases) has been well researched (Pfister, 2002). Such historic facts do not only underscore the role of the socio-cultural context for human behavior but also point to the relevance of power relations in dealing with climatic change.

## Coping with floods – Past and present

Back in Rolwaling, in November 2003, some enterprising community members mobilized the few remaining residents of the valley, to try and force the river back into its original bed by means of a boulder dam. For many days, men and women, boys and mainly girls struggled with the ice-cold water and piled up an embankment, only to realize during the following monsoon season that their collective effort remained, deplorably, a futile exercise. In 2007, at last, the Swiss Development Cooperation invited the Rolwaling community to submit a request for financial assistance. Under the auspices of the Summiteer's Club of the Rolwaling Sherpas, which assumes the role of the local community government, a project committee was formed. Since 2008 a solid gabion dam of roughly 600 hundred meters in length, designed by an engineering office and erected largely with local labor, protects the village against floods. New camping grounds on the river plain and lodge projects at the foot of the slope provide ample proof of regained confidence, at least for the time being[8]!

Historical photos from the early 1950s show how a solid embankment of boulders, collected from the river and reinforced with wooden poles, protected the Beding plain with its pasture and potato fields. Disaster preparedness had thus always been on the agenda of the headman and the Rolwaling community. Coping with floods is an important part of local, indigenous knowledge. Julie Dekens (ICIMOD, 2007a), who investigated disaster preparedness of villagers in the flood-ravaged plains of Nepal's Terai, identifies four pillars in this category of local knowledge, starting with *observation*, followed by *anticipation,* then *adjustment* and finally by *communication*. Indeed *communication* encompasses various forms of integration experiences into the commonly shared knowledge portfolio of a community, in the form of practical know how and also in the form of stories, poems or proverbs. "*The snake and the river don't run straight"* or "*Living near enemies and building houses near rivers are never wise.*" illustrates the folk wisdom Dekens has collected during her study. Yet local experience remains very often accumulated in the form

of tacit collective knowledge, only accessible to outsiders through longer-term interaction with local communities[9]. We therefore need to interpret *participation* also in the inverse sense that we, the outsiders, seek to *participate* in endogenous learning processes and learn to respect their outcomes. Tools that are based on experience with Participatory Rural Appraisals (PRA) can open the way (Chambers, 1983).

The disaster that struck Beding in 1990/91 constitutes a classic case of a flash flood, starting with a sudden and massive rise of the water level, occurring within minutes and quickly developing tremendous erosive power. Such floods mostly recede within a short time and usually deposit substantial amounts of sediment or debris. Flash floods can be triggered by excessive precipitation during monsoon or result from the cascade effect of a sudden draining of smaller supra glacial lakes, already described as *chhu bung* by local people. The impact of global warming on the growth of glacial lakes, moreover, may cause a sudden collapse of an end moraine dam, generating what is commonly known as a GLOF (Glacial Lake Outburst Flood). Crest waves, produced by massive landslides, may also have similar effects.

Flash floods are difficult to predict. Risk assessments and disaster preparedness, therefore, assume high priority. The case of Beding may also provoke some critical questions: Why did the floods surprise the community a second time? Was the second incident really again a flash flood, or did annual monsoon floods of the Rolwaling Khola just rush through the new shortcut of the previous year? Indeed, while the discharge of the main feeder lake, the Tsho Rolpa, amounts to only 0.05 m3/sec in early March, in July an outflow of roughly 19 m3/sec was measured (Mool et al., 2001. P. 5). During the monsoon, Rolwaling receives roughly 60% of the yearly rainfall between mid-June and mid-September (1993 to 2004). The amount, however varies greatly, between 829 mm (2004) and 355 mm (1993) (ICIMOD, 2011, p. 49).

In the aftermath of the flash floods of 1990/91 the Rolwaling Sherpas tried to draw public attention to leaks observed in the end moraine of the fast expanding Tsho Rolpa. They approached all embassies in Kathmandu with a letter, signed and thumb printed by the whole community. This plea for support remained unheeded (personal communication by John Reynolds). Michael Daman, in his personal capacity, and John Reynolds, funded by the British Government, started to raise the profile of the problem at Tsho Rolpa.

The Rolwaling Sherpas on their side undertook numerous attempts in river training to protect Beding, all in vain. In November 2003 the author witnessed some enterprising community members mobilizing the few remaining residents of the valley for a renewed common effort to force the river back into its original bed with a boulder dam. For many days, men and women, boys and mainly girls struggled with the ice-cold water and piled up an embankment, only to realize during the following monsoon season that they had invested in a futile exercise.

Community-based disaster preparedness obviously requires agreement and cooperation amongst the local leadership, an adequate local labor force and complementary external support. Such conditions could apparently no longer be met after the abolition of the village headman system, the increasing migration of young Sherpas from the early 1990s onwards and the outburst of the civil war, shattering all hopes for complementary external assistance[10]. This is confirmation that good governance at the local, regional as well as at a national level, constitutes a crucial precondition for effective response to climate change.

## Threats of new dimensions

The Hindu-Kush Himalayas are the youngest mountains on earth and are still experiencing orogenous uplift, accompanied by frequent earthquakes. The combined effects of intense monsoon rains, steep topography and fractured geology constitute the prime factors for flash floods. But several anthropogenic factors amplify the impacts regarding loss of human lives and physical damage. In the southern plains along the Himalaya range a growing number of marginalized farmer families desperately infringe temporarily dry riverbeds and out of desperation expose themselves to floods. Dekens (2007, p. 25) gives the voice to a farmer facing such a fate: *"We have been living here on the riverbed for 22 years. Before we used to live in a safer place than this, but we took a loan from a rich person in the village. Because we couldn't pay it back we lost our land and had to shift here to this vulnerable spot."*

Until recently, the degradation of watersheds due to haphazard encroachment on natural resources in intensively cultivated ranges of the Himalayas, attracted the main attention and produced not only a vast body of research over the years, but also strongly influenced the efforts of development agencies. Meanwhile, the focus is shifting to global warming

which is accelerating the melt rate of Himalayan glaciers and changing the seasonal run-off pattern. Indeed, according to the assessments of the Intergovernmental Panel on Climate Change (IPCC), the mean global temperature will continue to rise during the 21st century. Depending on the climatic model applied and on the scenarios chosen for greenhouse gas emissions, the rise in temperature will range from 1.4 to 5.8 degrees Celsius by 2100. In the high ranges of the Hindu Kush-Himalayas, as in the European Alps, global warming will cause progressive thawing of permafrost and glacial ice. The recently observed black carbon fallout adds to the concern because of its impact on the toxic load of watercourses. According to new studies in Tibet (Yasunari et al. 2010) and in the Arctic (McCornell et al., 2007), industrial black carbon emissions rank second in terms of impact on accelerated glacier melting, whereby big Asian countries, such as China and India, may have become the primary source of the black carbon fallout.

We are likely to face accelerated recession of most of the Himalayan glaciers for the foreseeable future and, as a consequence, a corresponding growth of moraine dammed glacial lakes. In places where the end moraines of such lakes are structurally weak and unstable they are prone to breach under the increasing lateral pressure of extending glacial lakes. Tackling

Figure 3: Tsho Rolpa 2010; the snout of the glacier receded by 4 km since the earliest assessments in the 1950s.

risks of such dimensions goes beyond the capacity of community-based flash flood risk management, as in the case of Rolwaling. A visit to Tsho Rolpa, the huge moraine lake of the Trakarding glacier, a few trekking hours up the valley from Beding, allows us a better understanding of the nature of such new threats.

### Living under the threat of an impending disaster?

The Tsho Rolpa Glacial Lake is embedded into an impressive amphitheatre of snow-capped peaks of six to seven thousand meters, towering above grass covered slopes of immense moraines, once formed by still huge but fast-receding streams from glaciers. Tsho Rolpa is situated at 4580 m, at the headwaters of the Rolwaling Khola, a tributary of the Tama Koshi River in the Dolakha District. The lake was formed by the receding Trakarding Glacier and is retained by a sizable end moraine. This moraine stretches over a width of roughly half a kilometre across the valley, with an elevation from base to crest of about 150 meters. The core consists partly of dead ice from an earlier glacial expansion. The average depth of the lake is about 52 meters, reaching 132 meters at its deepest point. The stored water amounts close to 80 million cubic metres and the water level fluctuates by two metres over the year. The entire catchment area of the Tsho Rolpa Lake encompasses over 77.6 sq. km.

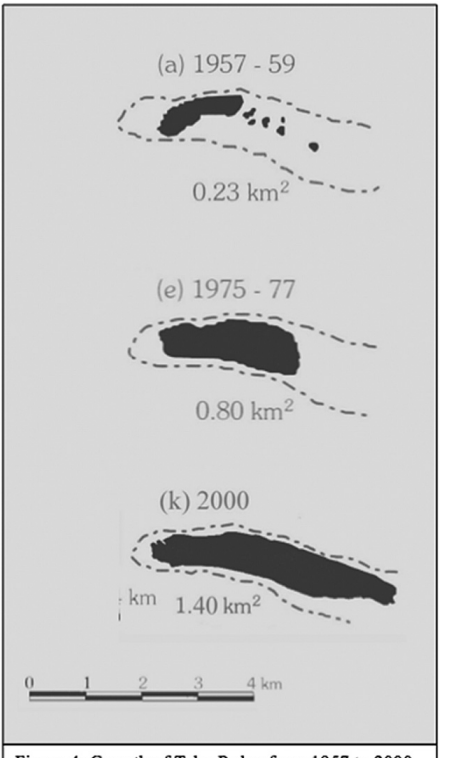


Figure 4: Growth of Tsho Rolpa from 1957 to 2000 (ICIMOD 2001

The lake was first mapped in the Indian Topographic Survey Map in 1959, showing a surface of about 0.23 sq. km. The surveys undertaken since 1992 (Damen, 1992), provide clear evidence of an accelerated recession of the glacier and on-going lake expansion[11]. Indeed,

between 1957 and 2000, the Trakarding Glacier records an average rate of recession of the glacier tongue of 66 m per year[12], one of the highest in Nepal.

The following figure provides an impressive picture of the successive growth of the glacial lake since the 1950s.

Yet despite the concerns of the local people, it wasn't until the rapid growth of the Tsho Rolpa that the lake and glacier attracted the attention of the Nepalese government and politicians.

### Assessing a potential glacial lake outburst

Seen through the eyes of a geologist such as König (2001), who explored the formation of the landscape of Rolwaling Himal under the impact of glaciers since the last ice age, the recent growth of the Tsho Rolpa Glacier Lake is just an insignificant episode in the long climatological and geomorphological history of the last ten thousand years. In historic times, however, the Himalayan glaciers, as in the Alps, reached their maximum extent during the last phase of the Little Ice Age, which lasted approximately from 1550 to 1850 AD. What remains of this expansion are lateral and terminal moraine deposits of impressive dimensions. The lower moraine of the Trakarding glacier is one of them. In contrast to König, the focus of geologists, such as Prof. Reynolds, commissioned for a risk assessment by the Government of Nepal (GoN) in the 1990s, is on the present and the immediate future. According to his assessment, the growth of Tsho Rolpa had already reached critical dimensions in the 1990s, and he requested a careful survey as the basis for a plan of action (Reynolds, 1999, p. 2009-2014). Rolwaling Sherpas, moreover, had observed an increasing number of leakage spots in the slope of the lower moraine, fueling the fear that such leakages could critically weaken the structure of the moraine.

### The making of a panic

*"There is a high probability that Tsho Rolpa Glacial Lake will burst in this monsoon season."* This was the doomsday conclusion that the Nepali national news agency drew after attending a seminar on 6th June 1997, where the above British consultant and his Nepali counterparts from GoN's Department of Hydrology and Meteorology presented the findings of their survey of the Tsho Rolpa Glacial Lake. The above journalistic interpretation all of a sudden converted the cautious and responsible

report on a possible future Glacial Lake Outburst Flood (GLOF) into a firm prediction. Within a few weeks, the districts along the Tama and Sun Koshi tributaries of the Sapta Koshi River were in a state of panic.

In order to draw lessons from the 1997 Tsho Rolpa GLOF and to promote more rational response policies, Gyawali and Dixit[13] (1997), conducted a thorough analysis of the causes and dynamics of the panic reaction. For that purpose they focused on the interface between Nepali science and Nepali society. Their justification was that the global outlook on the increasing frequency of natural hazards induced by climatic change creates new challenges for meaningful communication between science and society. It is thus important to highlight a few topics of general relevance, chosen from the analysis of these two authors.

A state of panic usually emanates from a muddle of rumors, facts and experience. According to Gyawali and Dixit (1997), rumors of this type are fed by the deep inner fears of the society concerned. With regard to a glacial lake outburst, we can easily trace back such fears to the yearly experience of torrential waters of monsoon-fed rivers, images of destroyed bridges and landslides wiping out entire homesteads. But even scientific inputs to a risk assessment ultimately remain subject to interpretation. In the case of Tsho Rolpa, such interpretations rapidly grew out of proportion and developed into the vision of a devastating flood, causing havoc all the way down to the plains of the Indian state of Bihar. On their way, the floods would destroy dozens of villages, damage the construction site of the 50 MW hydropower project of Khimti, wipe out the National Park of the Khosi Tappu Wildlife Preserve and even severely damage the huge Khosi-River-Barrage on the border with India. The information policy of the responsible GoN ministries of Nepal apparently was deplorable.[14] Under the pressure from members of parliament and local administration, the Home-Ministry reacted with hyperactivity. People in the endangered zones were instructed to abandon their settlements along the riverside and move to higher places, to cow sheds on the hill slopes for instance.

Cautious interventions by scientists, such as the ones by Gyawali and Dixit, were sidelined; in a letter to the largest selling national daily, they referred to empirical evidence gained from the Dig Tsho GLOF[15] of 1985. While severe damage in the vicinity of the outburst occurred, further downstream, a quick attenuation of the floods was observed. Translated into the Tsho Rolpa case, damage would be very severe within the first

25 km of Rolwaling valley. According to an ICIMOD study of 2011, a sudden break of the moraine dam would produce a flood peak of 7000 cu-m/sec leveling out to zero after two hours and forty minutes. In this worst scenario of ICIMOD's GLOF-Modeling the flood would reach the Rolwaling settlement of Beding after roughly forty-five minutes with a flood height of fourteen to fifteen meters. The settlement of Suri Doban, 41 km downstream in the Tama Koshi valley would have a grace period of one hour and thirty minutes before the flood would hit with a still unreduced height due to the narrow valley profile. In terms of vulnerability, it is estimated that along the first 100 km downstream, 20% of the agricultural land would become exposed to damage, affecting potentially 142,000 people directly and another 524,000 indirectly

In the face of the irresponsible handling of information, the credibility of the Government of Nepal among local people suffered a severe blow and the disinclination to take GLOF hazards seriously increased alarmingly. This was all the more unfortunate, as the villagers suffered additional hardship from the reaction of the local markets to the GLOF panic of 1997, for example. While prices doubled for basic consumer goods such as salt, and rent shot up for houses above the danger zone, they fell by half for local goat meat. Moreover, should farmers plant rice, faced with the prospect that floods could wash away the fields? And weren't there similar rumors the previous year and nothing happened? Many villagers suffered from burglary in their vacated houses from unscrupulous individuals who took advantage of the chaotic situation and encroached on public property. However, Gyawali and Dixit report from Rolwaling that the Sherpas believed that the blessings of local deities would prevent the lake from an outburst. Fear and confusion among downstream settlers were obviously in sharp contrast to the attitude of people living closer to the source of the potential disaster. Have the GLOF warnings finally introduced the Tsho Rolpa at the far end of the remote Rolwaling valley to the consciousness of the downstream settlers in the Tama Koshi valley?

Why should the Tsho Rolpa panic be taken seriously? From the Nepali context the two authors conclude: *"Because it shows how fragile the rational and scientific base in Nepali society is. It lays bare the wide gap between expert views, carefully documented in reports written in English and what the public, the politicians and the media understand in Nepali.*

The above statements touch on a crucial dimension of mitigation of and

adaptation to impacts of climatic change, since at the tail end of the whole process are vulnerable people, individuals, families and communities, counting on a credible engagement of the scientific community, politicians and government. To involve citizens into a meaningful discourse on climate change, backed by solid research and followed by effective actions, still constitutes a major challenge, and not only for Nepal. NGOs rightfully draw attention to the policy gap regarding the involvement of communities as genuine agents of change. In the recent past, the Government of Nepal has undertaken several first steps, on mainly a conceptual level, in favour of a more mindful involvement of local communities into the discourse on climate change. Examples of this involvement are the National and Local Adaptation Plans (NAPA and LAPA) which are elaborated on later in this paper. REDD, the programme for *Reducing Emissions from Deforestation and Forest Degradation*, offers a promising platform for an intensified discourse on the role of a natural key resource.

## Facing vulnerable livelihoods: Some reflections

There is hardly any doubt that global warming is rendering the livelihoods of Himalayan mountain communities more vulnerable. Vulnerability arises when human beings, as individuals or as a social unit, have to face harmful threats or shocks with an inadequate capacity to respond effectively. For example, when being exposed to tidal floods without access to a flood shelter in Bangladesh or to violence and corruption in favelas (slums) in Latin American towns without recourse to effective protection by the rule of law. Risk in turn is defined as the likelihood of occurrence of external shock and stress.

The twofold focus on both, the nature of *threats* on one hand and the *coping capacity* of a given livelihood system on the other hand, is essential for designing an effective strategy for reducing vulnerability, and also when facing threats by global warming. An effective disaster reduction strategy thus requires a sound assessment of the magnitude and nature of a threat and an equally careful exploration of the coping capacity of the concerned livelihoods. This allows negotiating whether it is more effective to tackle a threat directly with external intervention or rather to enhance the coping capacity of the affected people – or pursue both avenues. Yet, the coping capacity of people depends not only on asset endowment and skills, but is also rooted in the quality of a social organization and, moreover, in the inner strength and determination

that members of a social unit can mobilize. Rolwaling offers a good illustration of the above issues. Protecting settlements from the disastrous effects of flash floods has traditionally been within the reach of the coping capacity of the community. Only recently, due to a numerically reduced population, external support for rebuilding the protective embankments at Beding village was needed. The potential threat of a GLOF, however, calls for a size of intervention that goes far beyond the capabilities of any local mountain community.

Climate change is a phenomenon, which requires an adequate response on at least three levels of intervention; prevention, mitigation and adaptation. The Kyoto Protocol was the first, however, as yet, not very successful step of such a multi-level intervention process. (1) *Prevention* in terms of a reduction of greenhouse gas emissions, which is clearly a global issue, where countries act as key players and are called to join forces for collective action. (2) *Mitigation* of impacts, which calls for very context-sensitive measures, as experienced with Tsho Rolpa in Rolwaling. (3) *Adaptation* is understood as the ability to anticipate the adverse effects of climate change and take appropriate action to prevent damage or, in the positive case, to take advantage of opportunities that may result from climate change.

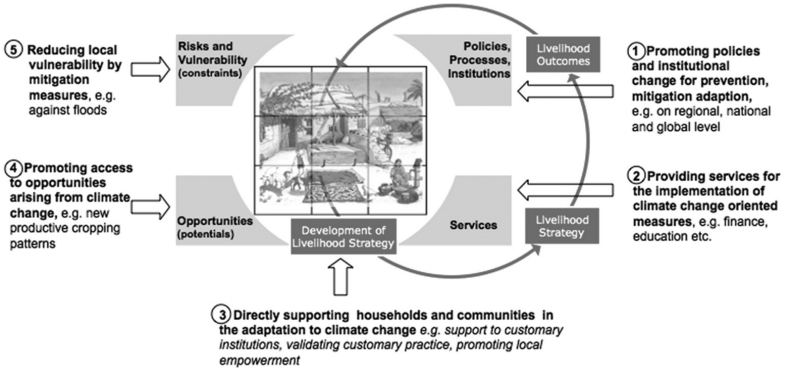
Regarding the issue of *Adaptation*, Nepal has formulated a *National Adaptation Plan for Action* (NAPA), which was signed in November 2008 between the Ministry of Environment and the country office of UNDP. The Global Environment Fund and two bilateral development agencies have also pledged support[16]. NAPA should enable Nepal to respond strategically to challenges and opportunities posed by climate change. NAPA is complemented at the micro level by a *Local Adaptation Plan of Action* (LAPA), which would identify local adaptation needs and extend direct support to vulnerable communities.

Ultimately, responding to adoption needs at a local level means to assist people in adjusting their livelihood strategies in such a way that even in times of climate change, their capabilities for achieving sustainable livelihoods are retained or enhanced. In line with the focus of this publication, we briefly illustrate a methodological option for approaching and better understanding customary institutions and practices as crucial elements of local livelihoods.

## Addressing customary practice with a livelihood approach

Livelihood strategies are the outcome of a complex interaction of factors and forces in basically two spheres of livelihood, namely in the *core* and the *context* as suggested in figure *5*. The drawing of a farmhouse in the centre of figure 5 stands for the *core of a livelihood framework*, in other words for the micro-cosmos of livelihood, where the actors of a given social unit, a household for instance, make decisions in an explicit or/and implicit form. The *context of a livelihood framework,* on the other hand, constitutes the outer sphere, which links local livelihoods to the socio-economic and political macro-cosmos. Such a set-up already was suggested by the livelihood approach developed by the Department for International Development (DFID) in the 1990s (Carney 1998). In the case of Nepal, the National Adaption Plan for Action, NAPA, would predominantly focus on the *context of a livelihood framework,* as illustrated in the following figure 5.

**Figure 5: Alleviation of climate change impacts: Entry-points in the context of livelihoods**



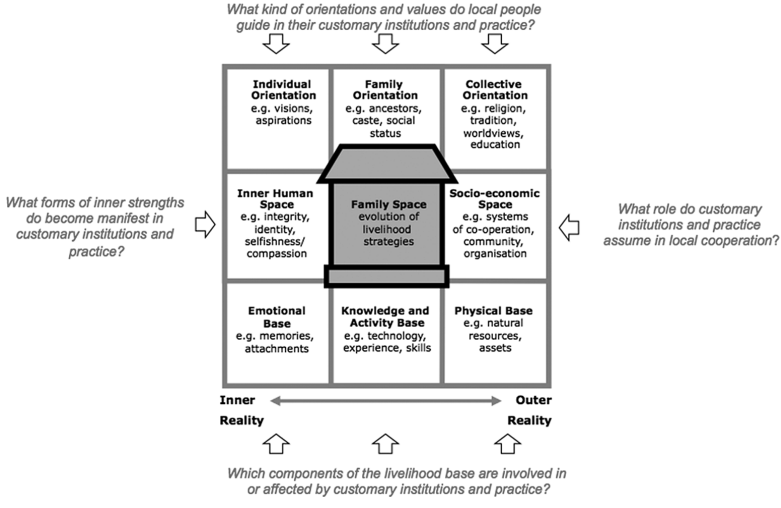

The five entry-points are largely self-evident. But the effectiveness of external interventions largely depends on the degree to which people in the core of the above livelihood framework are able to absorb the external support constructively into their own livelihood strategies, indicated by the loop in the framework. In order to be effective, the LAPA, with its focus on local communities, would have to acknowledge the relevance of local rationalities and especially the role, customary institutions and practices assumed in the prevailing livelihood systems and strategies. The main question is what is the best way to capture the myriad of local perceptions and to respect customary practices?

## "Keeping the house going" – a metaphor for sustainable livelihood

Lessons learnt during the course of an Indo-Swiss Research Collaboration on Rural Livelihoods (RLS) in semi-arid India might provide the answers. Farmers addressed in Gujarat captured the meaning of sustainable livelihood in their own words with the metaphor of "Keeping the House going – Ghar Chalava" (Baumgartner and Högger 2004). The translation of sustainable livelihood into "Keeping the house going" points, indeed, to a holistic perception that is deeply rooted in culture and society, in specific historical experiences and in worldviews, also formed by the interaction with the physical and social environment. The metaphor of a rural house in figure 6 suggests a three-tiered concept of livelihood: the foundation represents the material and non-material resource base, including the emotional resources of a livelihood (Högger, 2004). The walls shape, metaphorically, the room for three different notions of 'space', putting the family space of decision-making in the center. The roof, finally, points to the three-fold orientation of a livelihood system, (1) collectively shared orientations, (2) orientations held by the family and (3) orientations in the mind and heart of the individual[17].

The interaction with local farmers on the meaning of "sustainable livelihood" encouraged the Indo-Swiss research team to develop a heuristic tool for a structured approach towards the core of livelihood. The tool combines

**Figure 6: The nine-square mandala - Exploring potentials of customary practice for adapting to climate change**



the farmer's metaphor of *keeping the house going* with the nine-square mandala, which is cross-culturally recognized as a valid archetypical symbol of a holistic universe. Figure 6 succinctly illustrates how the tool can be used when exploring the customary practices of households.

In the final chapters we return once again to the Tsho Rolpa in Rolwaling valley, to review the realities of mitigation efforts, which turned into an expensive exercise of trial and error.

**Potential and limitation of containing a glacial lake outburst flood**

The Tsho Rolpa has now become a prominent case of mitigation. The mitigation experience is briefly summarized here in order to demonstrate the challenges and technical solutions faced in a high mountain environment. The first, rather modest interventions began in May 1995, when the *Netherland-Nepal Friendship Association* supported the installation of test siphons from Holland to lower the water level of the lake. These siphons functioned for 14 months until the welded joints of the pipes became dislocated. After repeated efforts, including with siphons locally produced by GoN, this type of mitigation measure was abandoned, mainly because discharge performance remained inadequate based on the requirements.

Meanwhile decisions for the next phase of mitigation measures[18], had already taken place. An open channel, 4.2 meter wide and 70 meter long, was cut into the left side of the lower moraine and equipped with a sluice gate. This enabled lowering of the water level of Tsho Rolpa by 3 meters. This first phase of mitigation work was completed by the end of June, 2000. The Netherlands Government provided major funding amounting to US$ 2.9 Million. The contribution of GoN was US$ 115,500. Yet at that time it was estimated that mitigating the potential danger of a Tsho Rolpa GLOF would be achieved only if the lake level was lowered in phases by a total of 20 m, aiming at a future annual discharge of 35 million m3 of water per year through gated canal openings, against the modest 4.5 Million m3 achieved so far. Although these figures are disputed among experts, they constitute the first glacial lake outburst flood operations to include civil engineering structures in the entire Hindu Kush Himalaya.

A more recent study by ICIMOD in 2011, using remote sensing data, identified 1466 glacial lakes in Nepal. While 21 of them were identified as potentially dangerous, ten were recommended for detailed field investigation and careful monitoring. The highest priority was given to

Tsho Rolpa. In contrast to earlier assessments, the recent investigations conducted for the top three critical lakes (the Imja in the Khumbu Everest Region, the Thulagi in Marsyangdi and the Tsho Rolpa in Rolwaling Himal), rated the immediate risk of a rupture of the end moraines lower than previous studies. The ICIMOD report on "Glacial Lakes and Glacial Outburst Floods" prepared for the World Bank in 2011, offers a detailed physical profile of these lakes, with a dam breach analysis and flood simulation for the downstream impacts.

## Who to pay the bill?

In the Himalayas, as well as the Alps, an alarming growth of glacier lakes and thawing of permafrost threatens people and physical infrastructures. Recent studies, such as the one commissioned by the Swiss National Science Foundation for the Swiss Alps (NSF; 2012), begin with the assumption that within the first half of the 21st century three quarters of the existing glacier surface as of the end of last century, would disappear (Zemp et al. 2006). Costs for adaptation and mitigation are difficult to forecast. However, the study also points to the potential of glacier lakes managed as reservoirs for irrigation or for generating hydro-electric energy. It argues, moreover, that in the Alps, at least, the new glacier lakes might partly compensate for the loss of tourist visits of glaciated landscapes. However, the authors leave no doubt about the need for constant monitoring of critical glaciers.

Regarding the Hindu-Kush Himalaya, considerable costs are already foreseeable for the monitoring task alone, not to mention the bill for sustainable mitigation measures. The financial burden will by far surpass the monetary capacity of smaller Himalayan states, such as Nepal and Bhutan to deal with the necessary measures, prompting the question; should the budgets for development cooperation be increased accordingly? There is little doubt that funding from industrialized states is needed, yet, to label such support as development aid would definitely be a grave misnomer. Such funding would hardly create any value added, as generally expected from development cooperation. On the contrary, the Western World, and also progressively emerging global powers such as China and India, should rather accept their responsibility for the immense external costs[19] of their successful industrialization. Economic growth continues to be largely fuelled by fossil, non-renewable energy with a corresponding impact on CO2 and black carbon emissions.

## Beyond science and technology

All of the three basic responses to climate change and global warming, be it prevention, mitigation or adaptation, constitute a serious challenge to modern science and technology, as well as to political decision-making. To implement sustainable solutions, the participatory collaboration of the people concerned at the micro level is required. Therefore, local worldviews and belief systems do matter. They shape our understanding, perceptions and response to natural hazards. Acknowledgement of these realities should therefore precede a necessary and critical questioning of the scientific rationality of local perceptions[20] and the required expansion of awareness.

### Endnotes

1. Ives et al. (2010; 7) refer to an inventory of 3252 glaciers for Nepal alone, established in the years 1999/2000. For risk assessment see the paper by Richardson and Reynolds for a more detailed number of events
2. The geographical location is 27° 85' North 86° 20' to 86° 30' West, see map: Rolwaling Himal, Kartographische Anstalt Freytag-Brendt und Artaria, Vienna 1974.
3. For the history of the Sherpa-migration into Nepal see Oppitz (1968) and von Fürer-Haimendorf C.(1964).
4. Sacherer, J., The Sherpas of Rolwaling Valley pp. 41 ff.
5. Ekvall (1968; 78) comments this issue as follows: "whenever community pressure becomes unacceptable, he has the capability of withdrawal from that community and he need not leave anything behind him in pawn. He is uniquely foot-loose and not inexorably bound within an unacceptable situation. Withdrawal may be temporary indeed, antisocial action may be followed by an immediate flight or a shift to a neighbouring community".
6. More recent interactions with the community repeatedly confirmed this belief:

   Under the title "Climate Change, the gods are angry: Rolwaling villagers say climatic change is result of divine wrath" Kishor Rimal, the correspondent of the Nepali Times at Dolakha, reports on February 2009 about an interaction with the community.

   Indeed, Rolwaling Sherpas connected sudden cases of sickness and untimely deaths in their community with explorations of a Japanese survey of the Tsho Rolpa In their perception, exploring the glacier lake had disturbed the Tangla, supreme god of all lakes. According to a Report by investigation team member Ganesh Khatri in Jana Astha of 16th July 1997, the community had to appease the angry gods after indecent behaviour of members of the Japanese team at the lake.
7. Public dancing had to be sanctioned by the priest. During the procession women were not allowed to wear coloured underwear!
8. Personal observations shed some doubt on whether adequate consideration had been given to the foundations for the gabions to avoid scour and subsequent undermining, as has happened previously.

9. In an attempt to understand the cultural dimensions of the endogenous generation of knowledge in Asian Economic Development, Nonaka and Reinmöller (1998) advanced a model with four modes of knowledge creation, drawing upon the familiar distinction between tacit and explicit knowledge. Tacit knowledge is experience-bound and either internalised individually or shared collectively. Explicit knowledge is exchanged through dialogue, making it accessible for systematised and shared understanding. A society can promote effective learning by paying attention to the links between spheres of tacit and explicit knowledge by means of a "learning spiral" (Nonaka, 1994).
10. The civil war also interrupted the village development efforts of Eco-Himal, an Austrian NGO, engaged in the Gauri Shankar area.
11. ICIMOD conducted field research with the risk assessment of of Tsho Rolpa in 2001 and the GLOF Modelling for three critical glacier lakes of Nepal: Tsho Rolpa, Thulagi Lake and Imja Tsho.
12. ICIMOD, UNEP 2007; Table 2.4: Retreat rates of some glaciers in the Nepal Himalaya,
13. Dipak Gyawali, member of the Royal Nepal Academy of Science and Technology and Ajaya Dixit, former member of GoN Water and Energy Commission.
14. In their assessment of the role of Ministries, Gyawali and Dixit (1997; 35) become more outspoken: " In the case of Tsho Rolpa, a myopic water authority (not so much for a personal but rather an institutional nature) seems to have ignored all evidence put before it between 1987 and 1997, thus delaying practical mitigation measures by several years. This short-sightedness can perhaps be attributed to the 'cultural bias' of the MWR (Ministry of Water Resources) *"… which is dominated by irrigation and electricity interests, and that too of a contractual construction nature based on foreign aid. Water management, vulnerability reduction, disaster mitigation, and promotion of local self-help become institutional blind spots in vision field dominated by tenders and procurement."*
15. Jack D. Ives et al 2010: *"The 4 August 1985, catastrophic drainage of the moraine-dammed lake (Dig Tsho) that had formed behind the end moraines of the retreating and thinning Langmoche glacier in the eastern section of Sagarmatha (Mt Everest) National Park proved a pivotal event. Eleven kilometers downstream of Dig Tsho, an Austrian Aid hydroelectric facility (Namche Small Hydel Project) that was nearing completion was totally destroyed within minutes of the outburst. Over a distance of 60 kilometers, fourteen bridges, more than two dozens of homes, and much agricultural land, were destroyed or damaged. That only four or five lives were lost was in part because the outburst flood coincided with traditional/religious celebrations so that few of the local people were near the affected river."*

    On initiative of Bruno Messerli, coincidently engaged in a Mountain Hazard Mapping Project together with Jack D. Ives, a first-hand examination of the impacts of the outburst flood could be undertaken by two Swiss graduate student (Vuichard and Zimmermann 1986; 90-93) and (Zimmerman 1987; 91-110).
16. Namely the Development Agencies of Denmark and Great Britain, as well as the Global Development Fund.
17. Rural houses on the Indian sub-continent indeed display the images of gods and photos of their ancestors above the entry door and/or under the ceiling.
18. The most common structural mitigation measures aim at reducing the volume of water in a glacier lake. This can be achieved by different measures or a combination of them: (1) Controlled breaching of the moraine (2) Pumping or siphoning the water from

the lake (3) Construction of a sleuth gate-regulated outlet (4) Tunneling through the moraine dam.

19. Costs or benefits that are not transmitted in the prices of goods produced are negative or positive externalities. They often reflect a market deficiency. Anthropogenic climate change, attributed to greenhouse gas emission from burning oil, gas and coal, generates external costs, since expenditures for prevention, adaptation or mitigation of negative effects of these emissions are generally not – or only partially—included into the prices of the respective goods produced.
20. Human perceptions are guided by explicit and tacit knowledge simultaneously. This can make decision-making appear "irrational" to outside observers. It is, moreover, often beyond the capability of the owner of the knowledge to make implicitly acquired knowledge explicit, i.e., to communicate it (Reber, 1993). In the ideal case, contextual knowledge for developing solutions results from successful interaction between local and scientific knowledge.

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## Forest Conservation and Managements: An Option for Climate Change Mitigation and Adaptation

**Roshani Dangi and Resham B. Dangi**

### Climate change—A global issue

The Earth's climate has changed throughout history, however the current warming trend is most likely human induced and is occurring at an unprecedented rate (Hougton et al., 2001). Carbon Dioxide ($CO_2$), the most common greenhouse gas (GHG) produced by human related activities, primarily excessive burning of fossil fuels and deforestation, is one of the major contributors to global climate change. Studies show a direct correlation between the Earth's temperature and the level of atmospheric $CO_2$. In the past few decades, atmospheric $CO_2$ and other gases from various human activities, have increased tremendously resulting in a change in temperature (Malmsheimer, et al., 2008). For instance, between the preindustrial era (circa 1750) and 2005, carbon dioxide amounts have increased from about 280 parts per million (ppm) to 379 ppm; methane from about 715 parts per billion (ppb) to 1,774 ppb; and nitrous oxide from about 270 ppb to 319 ppb (Solomon, et al., 2007). GHG emissions have roughly doubled since the early 1970s, and could rise by over 70% between 2008 and 2050. In the past, GHG emissions were mostly from the economic activities of developed countries, but two thirds of the recent increase of GHG is from developing countries (Organization for Economic Co-operation and Development (OECD, 2008). In 2000, the Earth's atmosphere constituted of approximately 72 percent human-related GHG emissions (Solomon, et al., 2007).

Most climate models show that the Earth's temperature has warmed by 0.7°C since 1900s, and a doubling of greenhouse gases is very likely to rise the Earth's global mean temperatures between 2 to 5°C by 2030—2060 (Stern, 2006). The Intergovernmental Panel on Climate Change (IPCC) has estimated that in the next two decades, temperatures are expected to increase by about 0.2°C per decade (Solomon, et al., 2007). The temperature minimums are expected to increase much faster than maximums, and the growing season is predicted to be longer, mainly in middle and high latitudes. Similarly, precipitation is expected to increase in tropical and high latitudes, but decrease in the subtropics and middle latitudes (IPCC, 2007). Furthermore, the frequency, intensity and duration of heat waves are expected to increase, but precipitation may become less frequent and more intense (Malmsheimer, et al., 2008).

Climate change is not just about increasing temperatures. There are cascading effects on natural ecosystem composition, structure, and function, and effects on forests, water resources, biodiversity, livelihoods, and natural hazards (Xu, Grumbine, Shrestha, Eriksson, Yang, Wang & Wilkes, 2009). Its impacts can be direct or indirect and could come into effect at present or in the future. While the direct impacts of climate change affect global mean surface temperatures, sea level, precipitation variability and seasonality, patterns of natural climate variability, and melting of sea and land ice, indirect effects may cause impacts on physical, biological, and socio-economic processes, including the livelihoods of people (Stern, 2006). According to EM-DAT, climate change has already adversely affected a large number of people worldwide between 1981 and 2010. Climate change-related disasters have negatively affected more than 5.5 billion people and have killed 1.4 million. The number impacted has increased from 2.2 billion in the earlier half (1981–1995) to almost 3.3 billion in the later period (1996–2010) (EM-DAT, 2010), which indicates an alarming increase in the number of people affected by these hazards. IPCC projections of climate change-related impacts show that by 2020, up to 250 million people in Africa may face a water shortage and yields from rain-fed agriculture may decrease up to 50%, seriously affecting food security. Similarly, in Asia, by 2050 freshwater availability is projected to decrease in the highly populated regions, whereas some areas may experience more frequent flooding (IPCC, 2007). These effects of climate change will lead to further loss of human live and increase negative socio-economic impacts.

Climate change is not just a local issue, it is also a global issue with no geographical or political borders and there is a growing concern that as a consequence of these changes, there will be negative impacts on ecosystems, human health, and socio-economic conditions. Even though the impacts of climate change are globally well known phenomena, the degree of impact is not evenly distributed. Some areas show notably elevated degrees of alteration compared with others. Different areas and environments are affected differently, and people living in these respective areas face different degrees and the impacts of climate change (Salick & Byg, 2007). For example, in Nepal, populations at higher altitudes may be vulnerable to glacier retreat, whereas in the lower altitude Terai region, people may suffer from extreme flooding due to increased river water discharge and heavy monsoon rain, or drought due to decreased river flows (UNFCCC, 2007).

In addition, it has been presumed that the underdeveloped and poorest countries and communities may be some of the first to suffer from the impacts of climate change (The World Bank, 2008), because of their geographical location, climatic conditions, high dependency on natural resources and limited capability to adapt to the changes (African development Bank, et al., nd). This makes certain communities and countries, particularly the poorest ones, most vulnerable to the effects of climate change. For instance, in the last century, it was the poorest countries in the Asia and South Pacific region that reported 91% of world's total deaths and 49% of the total damages due to natural disasters such as the 2004 Indian Ocean Tsunami and 2006 landslides in the Philippines (IFAD, nd)

Global climate change impacts have been rising and are predicted to have major impacts on geophysical, biological and socioeconomic systems (Schneider, et al., 2007). Therefore, it is very important for policy makers to understand the causes and effects of climate change and adopt appropriate adaptation and/or mitigation measures to minimize these effects on vulnerable communities. A review of previous literature suggests that the primary method of controlling or reducing climate change is to limit $CO_2$ emissions and the massive carbon stock stored in natural forests. Hence, it is important to understand the relationship between forests, $CO_2$ and climate to effectively and efficiently manage the issue of global climate change.

## Climate-forest dynamics

Climate plays a key role in shaping forests. In addition to soil and elevation, climate determines the type and quality of forest. Changes in temperature and precipitation play a significant role in forest quality and therefore have the potential to dramatically affect forest structure (Malmsheimer, et al., 2008). Forests and climate change are inherently linked, thus forests are not only shaped by climate but they also influence climate by affecting the carbon and water budget in the atmosphere. Vegetative cover also helps to regulate solar energy absorption and radiation processes. Therefore, forest cover helps to cool the earth's surface during the day by intercepting direct sunlight before it reaches the ground and keeps the surface warm during night by insulating the radiation of heat back into the atmosphere. There is a strong interrelationship between forests and climate, and a change in one will very likely influence the other (Malmsheimer, et al., 2008).

Climate change affects the growth and productivity of forests directly due to changes in atmospheric $CO_2$ level, and indirectly through complex interactions in forest ecosystems (EPA, 2013). Increases in atmospheric carbon levels due to climate change, will affect forests on different levels. For instance, at the individual tree level, an increase in $CO_2$ will increase net primary productivity and overall biomass accumulation, in the form of fine root production and also through allocation to woody biomass (Ainsworth & Long 2005; Norby, et al., 2004; Malmsheimer, et. al., 2008). However, this may vary with species and location (Malmsheimer, et. al., 2008). Thus, climate change can cause accelerated vegetation growth and productivity in certain areas (Kirilenko & Sedjo, 2007), while having the opposite effect in others (Shugart, Sedgo, & Sohngen, 2003) due to a difference in forest type (Dai, et al., 2013) and location.

Due to predicted climate change, areas of the higher Himalaya may change, for instance temperate grasslands and cold temperate coniferous forests could expand, whereas temperate and cold deserts may shrink and the vertical distribution of vegetation zones could move higher. These kinds of boundary shifts due to climate change may increase grassland areas and provide more favorable conditions for livestock production (Eriksson, et al., 2009) and agricultural production, creating pressure on the nearby forests and existing biodiversity. Furthermore, the increasing population continues to encroach on forests for cultivation, grazing, fuel wood and other purposes (Parry, Canziani, Palutikof, Linden & Hanson,

2007). These pressures, along with climate change, will exacerbate the pressures on the existing forestland.

There is growing concern about the climate-induced modification of the frequency and intensity of forest fires and the effects of insects on the trees because climate change can alter tree physiology and defense mechanism of the species. The incidence of forest fires has increased substantially in recent years due to increased temperatures and dryness. Lowland forests loose litter, dead wood and shrubby biomass by surface fires, whereas carbon stocks on the ground and above the ground are burnt in mountain forests by crown firing and thus release substantial amounts of carbon dioxide into the environment. Although there have been no systematic studies of this, in many places, local people have noticed new pests and diseases and an increase in forest damage by insects.

In the near future, the disturbance of forests due to forest fires, alien species invasion, and flooding is likely to affect forest structure and function (Shugart, Sedgo, & Sohngen, 2003) more than just by the direct affects. Due to environmental changes and anthropogenic stress, many species have become extinct and ecological processes have changed causing an imbalance in the forest ecosystem (Thompson, et al., 2012). Habitat alteration and loss are the major causes of species extinction (Vié, et al., 2009; Thompson, et al., 2012). For instance, in the Koshi Tappu Wildlife Reserve and surrounding areas, increased flooding in the past few years has also elevated pressures on the existing reserve and ungulates found in the area, particularly wild water buffalo. It has been reported that many water buffalo have died due lack of food or access to it (Heinen, 1993). Similarly, with the current rate of deforestation, forest degradation and climate change, at least 1800 species are predicted to be on the verge of extinction in the next few decades in the Amazon region (Hubbell, et al., 2008; Thompson, et al., 2012).

Climate change will have severe impacts on natural resources and many threatened species, making them more vulnerable. Other impacts of climate change may include soil erosion, floods, and landslides which have already affected the availability of fertile soil. These factors will have further impacts on agricultural productivity by increasing pressures on forests and stressing the existing biodiversity.

## Role of forests in reducing Green House Gases (GHGs)

Global forests play a critical role in managing the global carbon budget because trees remove $CO_2$ from the atmosphere and store it in their roots, stems, trunks, and leaves through the process of photosynthesis. This process does not permanently remove the carbon from the atmosphere, but it does sequester carbon for an extended period while balancing the additional GHG emitted (Thompson, et al., 2012). It is estimated that globally, forests and soil contains approximately 1,146 petagrams of carbon, out of which about 37 percent is in low latitude forests, 14 percent in mid latitudes, and 49 percent in high latitudes (Dixon, et al., 1994). The changes in land use from forest to non-forest use releases carbon into the atmosphere. Between 1850 and 1998, an estimated 136 billion tons (33 percent) of carbon was released in the atmosphere globally. A further 2.6 billion tons of carbon is released into the atmosphere due to global tropical deforestation. Forest soils can also be a sink for methane and globally, soils sequester 20 million tons of methane per year, which equals 400 million tons of carbon (Watson, et al., 2000; Malhi & Grace, 2000; Malmsheimer, et al., 2008). Hence, storing carbon in trees, wood products and soil can offset emissions of GHG, which can be sold on the carbon market to reduce or offset GHG emissions (DNR, 2014).

Forests can act as a carbon sink, playing a key role in offsetting greenhouse gas emissions (Malmsheimer, et. al, 2008), because global forests cover 3,952 million ha (about 30 percent of the world's land area) and account for about 1,036,200 carbon stock in living biomass ($MtCO_2$) (FAO, 2006a; Nabuurs, et al., 2007). Statistics show that the world's forests assimilate 2.4 billion tons of carbon dioxide each year, representing the world's most significant terrestrial carbon storage. An estimated 77 percent of carbon is stored in vegetation, and 39 percent in soil representing twice as much carbon present in the atmosphere (CIFOR, nd). Thus, global forest ecosystems are a major reserve of the terrestrial carbon stock (Lal, 2005), and play a significant environmental role. Through their $CO_2$ sequestration, forests represent a potential solution to the global climate change problem (Salimon, et al., 2011). Carbon sequestration by forests can be one of the most effective and least costly options to mitigate climate change while providing multiple benefits. About 850 million hectares of degraded forests have the potential to be restored and rehabilitated in order to bring back lost biodiversity and contribute to the mitigation and adaptation to climate change (FAO, 2010).

## Forests and carbon management

Forests of all ages and types have the capacity to sequester and store carbon, however, the enhancement of this capacity requires maintenance of forest land, avoiding improper land use practice, increasing forestland by afforestation, restoration of degraded areas and increasing tree density on low stocked areas. The Western Forestry Leadership Coalition suggests two approaches to forest management. The first is adaptation, which involves improving forest health, and making them more resistant and resilient. The second is mitigation, which involves the use of forests and forest products to sequester carbon, provide renewable energy through biomass and avoidance of carbon loss due to fire, mortality, and alternate land uses (Malmsheimer, et al., 2008).

Climate change mitigation and adaptation relate to sustainable development goals, but are different with regards to time frame and distribution of benefits. The direct benefits of mitigation are global and long term while for adaption, they are local and short term (IPCC, 2007). Therefore, adaptation and mitigation could either be complementary or incompatible for any given area of forest land. A complementary situation can occur where activities that maintain forest resiliency also serve to reduce the risk of wildfires, $CO_2$ emissions, etc. An incompatible situation may occur when the objective of a forest is to sequester high levels of carbon while the adaptation strategy requires reducing carbon stocks (Malmsheimer, et al., 2008).

The net benefits of minimizing the contribution to climate change versus the cost of GHG emission reduction measures are assessed to determine the tradeoffs between adaptation and mitigation measures. The minimized climate change contributions should include adaptation options and the cost of GHG reduction measures should consider the full range of possible climate outcomes, including irreversibility and uncertainty (IPCC, 2007). Focus should remain on the assessment of short term impacts of the socio-economic determinants of vulnerability in a development context (Burton, et al., 2002), and adaptation policies should be formulated as a coping strategy against the vulnerability based on that assessment (IPCC, 2007).

Adaptation is a decision-making process comprising a set of actions that are undertaken to adjust the socio-ecological systems without implementing significant changes. The goal is to mitigate actual, perceived or probable environmental changes and their impacts while maintaining the option to re-

develop the actions. Therefore, adaptation involves various activities that are needed to reduce vulnerability and build resilience in key, vulnerable sectors. Similarly, resilience is considered to be a reflection of vulnerability as it explains the capacity of an individual or a community to absorb the stress without changing the structure and function (Finan, 2009).

Thus, to adapt to climate change is to make adjustments to the socio-economic and ecological systems in response to the effects of climate change. Management strategies to adapt to climate change include keeping forests healthy, diverse, and resilient. Also, proper monitoring and quick detection and capacity to tackle adverse effects such as forest fires and pest outbreak, is important. Hence, adaptation strategies can be viewed as a risk management component of sustainable forest management, and they should be responsive and include diverse aspects of socio-economic, political, and environmental circumstances (Rahman, 2011; Spittlehouse, 1997; Stewart, et al., 1998).

Climate change mitigation involves taking action to prevent, reduce, or counterbalance the emissions of greenhouse gasses (GHGs) such as, $CO_2$ and $CH_4$, which are contributing to global climate change. Thus, mitigation of climate change is specifically targeted towards lowering GHG emissions. IPCC (2007) has categorized climate change mitigation options in the forestry sector as below:

a. *Maintaining or increasing forest area through reduction of deforestation and degradation by aforestation/reforestation*: Land use change due to deforestation and degradation is one of the most significant sources of carbon emissions contributing to global warming. Statistics indicate that deforestation releases more $CO_2$ than the transportation sector (CIFOR, nd). Deforestation and forest degradation have resulted in the reduction of carbon stock and an increase in greenhouse gas emissions and loss or impairment of many forest goods and services. Between 2000 and 2010, due to various natural causes, each year about 13 million hectares of forest were converted to other land uses or were lost. Deforestation alone contributed about 17% of the world's GHG, thus, forests and their proper management are considered to be of central importance in climate change mitigation (FAO, 2010). In certain conditions, deforestation and forest degradation can be controlled or delayed through sustainable forest management techniques,

policies, or practice or by providing other economic incentives or alternative options that do not include harvesting of forests products. Completely ceasing to harvest forest products will maintain forests and forest carbon but will also drastically reduce the wood and land supply needed for societal needs below sustainable levels (IPCC, 2007). Therefore, countries can strengthen the sustainable wood product supply chain by extending forest cover beyond natural forest territories and keep old natural forests well managed. Similarly, afforestation and reforestation activities will increase the carbon stock due to an increase in biomass and dead organic matter carbon pools, however in some sites with high soil carbon stocks such as grassland ecosystems, soil carbon may decline after afforestation (IPCC, 2007).

b. *Forest management to increase stand and landscape level carbon density:* To maintain landscape-level carbon density, the forest management practices include reducing forest degradation through plantations, tree and stand improvement, fertilization, and other silvicultural techniques. Similarly, carbon density can be maintained by using forest conservation techniques, extended forest rotations, and protection against fire and insects. Forest management activities also include harvesting systems that maintain fractional forest cover, reduce loss of dead organic matter or soil carbon by lessening soil erosion and avoidance of other high-emission activities. Restoration activities after loss of trees reduces carbon loss in natural regeneration however, extensive use of fertilizer for speedy growth may potentially diminish the benefits of carbon sequestration due to higher $N_2O$ emissions. Additionally, peat bogs, for example, may experience substantial carbon loss due to enhanced respiration caused by drainage of soils, but moderate drainage may increase peat carbon accumulation (Ikkonen et al., 2007; Minkkinen, et al., 2002; IPCC, 2007).

c. *Increasing off site carbon stocks in wood products and enhancing product and fuel substitution with high fossil fuel requirements and increasing biomass-derived energy to substitute fossil fuel*s: Wood products derived from sustainably managed forests address the issue of saturation of forest carbon stocks as they can be used to displace fossil fuel intensive materials such as concrete, steel, plastic, etc.

Research shows that using wooden frames reduces the lifecycle of net carbon emissions from 110kg of $CO_2$to 470 kg of $CO_2$ per square meter of floor area (Gustavsson & Sathre, 2006; IPCC, 2007).

## Climate change policies

The level and intensity of climate change impacts in a region vary over time and there is growing interest about planning, creating, and implementing market-based climate change policies (Aldy & Pizer, 2008). International consensus is a critical aspect of an effective global response to climate change. The developed countries and developing countries have been engaged in discussions at various international summits, trying to come to an agreement about what policies to put in place in order to lessen global GHG emissions. However, there are various disagreements mainly pertaining to the choice between economic development and environment, and creating policies to mitigate climate change or adapt to.

Initially, Freeman Dyson proposed the concept of using large-scale plantations to control rising carbon dioxide levels in the atmosphere (Dyson, 1977). In the 1980s, this concept was on the international climate agenda as scientists began to understand that forests are a significant source and sink, of the carbon cycle (Houghton et al. 1990 in Boyd, Corbera & Estrada, 2008). In 1992, realizing the danger posed by climate change and the increasing scientific evidence pointing towards aggravated effects of climate change, an international treaty namely the United Nations Framework Convention on Climate Change (UNFCCC), was formed at the United Nations Conference on Environment and Development (UNCED), popularly known as the Earth Summit. The treaty's goal is to alleviate human related greenhouse gas concentrations in the atmosphere to a level that would not negatively interfere with the climate system. Annual meetings at Conferences of the Parties (COP) evaluate the progress in dealing with climate change. Unfortunately, there are major disagreements regarding the Kyoto Protocol amongst nations with respect to the reduction of GHG.

Presently, the developed countries are by far the main contributors of greenhouse gasses, but recently, developing countries are catching up and are industrializing at a fast pace in the name of economic development with very little effort regarding environmental protection and greenhouse gas emission control. Various market-based instruments like

a carbon tax and cap and trade have been suggested at the COP meetings to reduce emissions in a cost-effective way, but not all nations agree on the proposed approach.

### Carbon trading: Taxes vs. emissions

The Kyoto Protocol mandated that GHG emissions for the major industrialized countries be reduced by an average of 5% relative to 1990 levels between 2008 and 2012 (UNFCC, 2012). Since the Kyoto Protocol, many other approaches have focused on implementing market-based climate change policies. The European Union started the Emission Trading Scheme (ETS) in 2005, covering nearly half of all $CO_2$ emissions in the EU, and announced its intent to continue the ETS beyond the Kyoto Protocol's 2008-2012 period of commitment (European Commission, 2008). Conversely, other governments, such as Costa Rica and Canada, have pursued the carbon tax (Aldy & Pizer, 2008).

There is general agreement among the experts that the implementation by any government should be based on instruments that lead to an efficient allocation of abatement activities. The Kyoto Protocol is focused on market-based approaches hence many proposals tend to favor the cap and trade systems, but recently, several arguments favored the internationally harmonized carbon tax, which is lauded as simple, flexible and dynamic and incorporates uncertainties, and administrational and political feasibility (Peterson & Klepper, 2007).

In a cap and trade system, a regulator sets a limit or cap on the amount of GHG that may be emitted. The cap is allocated to agencies in the form of emission permits which represent rights to discharge a specific volume of pollutant. If agencies require more credits, they can buy permits from the market (Stavins, 2001). Therefore, the buyer is paying for the right to discharge pollution and the seller is rewarded for lowering pollution. The carbon tax is a quantity-based instrument in which the price is imposed per unit of emission (Pindyck & Rubinfeld, 2009).

The important distinction between the cap and trade and tax policy is the adjustment during an unexpected price change. A quantity system is adjusted by changing the permit price while holding the emissions level constant whereas a price or tax system is adjusted by changing the level of total emissions while holding the price fixed. Price policy provides a fixed incentive (dollars per ton of $CO_2$ emissions) regardless of the emission

level, whereas a quantity policy like the carbon tax generates incentive by strictly limiting emissions to a specified level. Thus, cap and trade fails to guarantee that emissions will always be below a particular level whereas price controls like tax create a fixed incentive to reduce $CO_2$ to a certain level regardless of the uncontrolled emission levels. A carbon tax that is set equal to the marginal cost of $CO_2$ strikes a balance between emission reduction cost and resulting benefits. Under a carbon tax, every time an agency decides to emit $CO_2$, there will be an added financial burden, which is equal to the marginal damage, creating incentive for the industry to reduce emissions. Whereas in cap and trade, there is less effort in new technology investment and little emphasis is placed on reaching a particular emission target because there is no obvious quantity target to choose (Anderson, et al., 2003).

Price, under a carbon tax, fluctuates much less compared to quantity control, therefore tax policy can generate more economic gains (expected benefits minus expected costs) than the quantity-based mechanism. Hence, carbon tax is preferable to a cap-and-trade approach in terms of social costs and benefits, but this policy has several political implications. For instance, in the United States, businesses oppose this carbon taxes policy because the revenue is transferred to the government whereas with the permit system, there are few chances of getting a permit for free or generating revenue by trading unused permits (Anderson, et al., 2003).

In spite of all these differences, both policies can be used with the same result, ignoring uncertainty and assuming that the costs of controlling $CO_2$ are known. Both of these policy mechanisms, the tradable permit system and the price mechanism, can be cost-effective since in both policies, only those emitters who can reduce emissions below the given fee or tax, will do so (Anderson, et al., 2003). Therefore, with increased certainty and known price, both of these instruments can be cost effective and an optimal social level can be achieved.

## Carbon markets

The Clean Development Mechanism (CDM) was created as a part of the Kyoto Protocol to help developed countries meet their emission targets and encourage developing countries to contribute to carbon reduction efforts. CDM allows developing countries to earn emission credits that can be traded and sold, and can be used by developed countries to meet

their side of emission reduction targets defined under the Kyoto Protocol. However, CDM only allows emission reductions from afforestation/ reforestation (AR), which does not include activities aimed at Reducing Emissions from Deforestation and Degradation (REDD) and Improved Forest Management (IFM) due to the skepticism over the credibility of carbon benefits from such projects. In 2007, during the Bali COP meeting, an agreement was reached to negotiate a new post 2012 climate change protocol by 2009, which contained commitments to include REDD. The new, forthcoming 2012 agreement includes all forest carbon mitigation strategies which provide an opportunity to discuss the important topics of carbon emissions and carbon sequestration potential of the forest sector (The Nature Conservancy, 2009).

Presently, only voluntary markets allow offsets from all three types of forest projects: REDD, AR and IFM. REDD-plus is a concept that reduces forest carbon emissions by reducing deforestation and forest degradation, sustainable management of forests, carbon stock conservation, and carbon stock enhancement. The last three elements are related to IFM activities that increase forest carbon stocks by changing the way they are currently being managed and it could include the promotion of denser, healthier trees, or the conversion of previously harvested forests to a protected area. AR is about replanting and natural regeneration of forests by which forests can be re-established to their previous state, hence increasing the forest carbon stock (The Nature Conservancy, 2009). In 2008, the total carbon market value was $705M and 10 percent of it was from the forestry sector (Hamilton et.al, 2009; The Nature Conservancy, 2009). Even though there are several challenges associated with carbon baseline, measuring, monitoring, and accounting of forest carbon due to leakage and permanence, it can be addressed by proper planning, design and implementation of projects developed for voluntary carbon markets.

### REDD-Plus as a mitigation option

Presently, many developing countries, including Nepal, are attempting to adopt REDD+ (reducing emissions from deforestation and forest degradation) as a result-based payment mechanism that will allow developing countries to access incentives to carry out forest-based climate change mitigation measures. Forest conservation and management is the key for the successful implementation of REDD+, because the payment system is based on performance achieved in net carbon emission reduction

from the agreed upon reference baseline. This allows limiting emissions from deforestation and forest degradation while enhancing carbon stocks from improved forest management interventions. Therefore, carbon sequestration from forests can be an inexpensive way to lessen climate change impacts and a principal means of mitigation (Rahman, 2011).

However, these kinds of mitigation measures are not automatically compatible and tradeoffs may be required (West, 2012). For instance, for the local people, carbon trading is only attractive if resource extraction is allowed (Karky & Skutsch, 2010) but the emphasis on forest protection in a REDD+ site may restrict access of the poor to forests (West, 2012) thereby affecting the poorest households the most. The potential trade-offs of REDD+ activities may arise from the characterization of forests as a carbon sink or as a source of livelihood source for a community. Implementation of REDD+ in this context, may be challenging, and if it's not properly designed with strong safeguards, then it can create potential conflict. These kinds of trade-offs between resource use and carbon stock, need to be clearly acknowledged and addressed in a national REDD+ strategy, Safeguard Information System (SIS) and Emission Reduction Program planning.

Protecting and enhancing biosphere carbon stocks has been considered an effective mechanism to tackle climate change problems. However, direct and indirect impacts of climate change may affect the growth and productivity of forests (EPA, 2013) which, in turn, may undermine the success of REDD+. In the long run, therefore, the successful implementation of REDD+ policy and approaches will depend on the resilience capacity of forests to climate change.

## Conclusion

Climate change has become a major global issue due to its negative impacts on various sectors, which further amplifies the problems affecting people and the environment, globally. Climate change impacts on natural and human environments have been emerging and are predicted to accelerate in the near future. Hence, various mitigation efforts are being designed and implemented to alleviate impacts of climate change, which include different market-based instrument like carbon tax and cap and trade that have been in practice under the clean development mechanism to reduce emission in cost-effective ways. Despite these efforts, the desired level

of GHG gas emission reduction has not yet been achieved. It is thus very important for policy makers to assess the vulnerabilities and create mitigation and adaptation strategies to effectively manage the climate change issue.

Forests play a key role in sequestering carbon but recent climate changes have negatively influenced forests in various regions and there is growing concern that in the near future, forests may turn into sources of carbon rather than sinks, if not managed properly. There are many management approaches to protect forests and mitigate the impacts of climate change. It is also clear that no one single strategy can help to achieve all the desired goals. Thus an appropriate forest management scheme is important in order to serve several functions; regulate forest ecosystem services and improve provisioning services for economic and livelihoods improvements. This will also help in the mitigation of and adaptation to climate change.

There is a need to plan and implement improved forest management activities to achieve the twin goals of improving the sink capacity and the health of forests. The planned activities should be simple, achievable and flexible in both the short and long terms. This type of approach should be dynamic and able to add value to the decision making process under the current policy including the uncertainty introduced by the complex ecosystems. Similarly, it should use the available technologies for modeling and monitoring the occurrence and direction of land use and forest cover change over time, which could provide valuable information in order to better understand the current trends and predict future pathways of change.

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## Climate Change Induced Livelihood Vulnerability Situation in Upper Tamakoshi River Basin, Nepal

**Prem Sagar Chapagain, PhD, Pawan K. Ghimire and Deepak K.C.**

### Background

The Hindu Kush-Himalayan (HKH) region is one of the most hazard-prone regions in the world. Outside the polar regions, the short-term and long-term impacts of climate-induced hazards are most pronounced in this region. Climate-induced hydro-meteorological hazards such as landslides, floods, and Glacial Lake Outburst Floods (GLoFs), occur more frequently in the HKH region and pose unforeseen challenges to the ecosystem and the livelihoods of the people (UNDP: NA)

Many studies (Liu & Hou, 1998; Shrestha et al,. 1999; Liu & Chen, 2000; IPCC, 2007*a*; Nogues-ravo et al., 2007 cited in XU et al., 2009) have shown that in the Greater Himalaya, the progressive warming at high elevations is occurring at approximately three times the global average. According to the Intergovernmental Panel on Climate Change (IPCC) (2007a), the average annual mean warming over the Asian land mass will be about $3^0$C by 2050 and $5^0$C by 2080. IPCC (2007) reported that over the last 100 years, warming in the Himalaya was much greater than the global average. Furthermore, the Panel warns of an increase in the number of high intensity rainfall events with fewer rainy days across most of the South Asian region. The projected climate change will potentially be catastrophic to people, their livelihood and the ecosystems (Anderson & Bowe, 2008; Hansen et al. 2008; Solomon et al. 2009). Thus, a systematic study on the vulnerability situation is critical

in a developing country where peoples livelihoods depend primarily on agriculture and where their ability to respond to climate change-induced hazards is hampered by limited technical and financial capability (Dulal, 2010; Ninan & Bedamatta, 2012).

Nepal is highly vulnerable to climate change as its elevation ranges from about 60masl to 8,848masl and the effects of climate change tend to increase with increasing elevation. The temperature trend from 1979 to 2000, shows an increase by $0.01^0$C below 1000masl, $0.02^0$C from 1000-4000masl and $0.04^0$C above 4000masl (Sharma et al., 2009). Increasing temperatures consequently affected rainfall amounts, patterns and extreme events that are factors in causing loss of human life and property. These changes combined, have increased uncertainty and serve to undermine the development processes (NAPA, 2010). In order to reduce vulnerability, it is necessary to integrate climate change into the planning process, which requires an understanding of the climate change variability and vulnerability situation of the people (MoSTE, 2013).

Smit, et al. (2007) claim that adaptation and coping strategies in developing countries are highly varied because of prevailing poverty, landlessness, and disability, therefore local-level studies are needed in order to properly understand the situation and for setting the development policies effectively. This is very applicable in the case of Nepal where a majority of the people are dependent on an agro-pastoral production system and there is widespread poverty, inequality, unemployment, and climate variability. This combination of factors, leads to a poor adaptive capacity amongst the poor and marginalized households, and particularly women (Oxfam, 2009). It is claimed that more than 1 million people in Nepal will be vulnerable to climate-induced disasters such as floods, landslides and drought every year (MoHA /UNDP, 2010). National Adaptation Programmes of Action (NAPA, 2010) has also classified Nepal's 75 districts in the five broad climate change vulnerability classes from very low, low, moderate, high to very high. As per this classification, Dolakha district,where this research was carried out, lies in the category of very high climate change vulnerability. The main bases of assessing vulnerability are the exposure, sensitivity and adaptive capacity of people. The districts were ranked according to their adaptation planning and ability to mobilize financial resources for implementation adaptation programs. According to desinventar data (www.desinventar.net), 62 people have lost their life, 471

were affected, hundreds of hectares of farming land was damaged, and millions of rupees worth of property was destroyed by landslide and flood-related disasters in this area over the past 40 years (1971-2010).

## Conceptual framework

Climate change vulnerability analysis is often done based on a socio-economic approach or from the point of view of bio-physical factors. This vulnerability study, however, is based on an integrated analysis of bio-physical, socio-economic, and hydro-metrological factors combined with local knowledge and practices through broad engagement of the communities. Vulnerability is conceptualized as a function of exposure, sensitivity and adaptive capacity (IPCC, 2001). Exposure is defined as the potential harm to people, their property, livelihood and environment, as a result of the magnitude and duration of a climate change-related natural hazard such as drought or flood (UNISDR, 2009). Sensitivity is the degree to which the system is affected due to the exposure. Adaptive capacity is the systems ability to resist and/or recover from the exposure (IPCC, 2001; Ebi *et al.*, 2006; Smit & Wandel, 2006). These three elements are thoroughly assessed, primarily based on primary and secondary data collected in 2011 and 2014.

The following steps were undertaken; a) identification of hazards, their magnitude and probability of occurrence based on frequency and the likelihood of changes in the hazards as a result of climate change; b) identification and quantification of elements exposed to the hazards; c) estimation of sensitivity of the exposed elements (loss or damage) based on past experience; d) assessment of coping and adaptive capacity of people and institutions based on the analysis of livelihood strategies and outcomes; and e) development of a combined livelihood vulnerability index for all 25 settlements in the five VDCs in the basin . A similar approach was effectively used in a similar context by UNDP Nepal (2011, 2012).

The Livelihood Vulnerability Index (LVI) is used as a tool to assess vulnerability associated with climate variability and change (Hahn et al., 2009). The LVI uses a balanced weighted average approach in which each of the sub-components contribute equally to the overall index and it is very useful in evaluating the vulnerability level and ranking the communities based on the index value. The parameters used to calculate LVI are given in Table 1.

Each of the major components of the contributing factors consist of several sub-components. As the sub-components are measured on different scales, they need to be standardized to a scale from 0 to 1. The following equations are used and are the same as used by UNDP in their preparation of the Human Development Index of 2007.

$$\text{Index}_{sc} = \frac{S_c - S_{min}}{S_{max} - S_{min}}$$

Where, $S_c$ is the original sub-component for community c, $S_{min}$ and $S_{max}$ are the minimum and maximum values, respectively, for each sub-component determined using data from twenty five communities in the study area. After standardizing, the sub-components are averaged using the following equation to derive the value of each major component;

$$M_c = \frac{\sum_i^n \text{Index}_{Sci}}{n}$$

In which $M_c$ represents one of the nine major components for community, index Sci represents the sub-components, indexed by i, that make up each major component, and n is the number of sub-components in each major component.

The contribution to vulnerability of exposure, sensitivity or adaptive capacity for a community, c, is calculated using the following equation.

$$CF_c = \frac{\sum_{i=1}^n w_{Mi} M_{ci}}{\sum_{i=1}^n w_{Mi}}$$

In which, $CF_c$ is the contributing factor for a community, c, $M_{ci}$ are the major components and n is the number of major components in each contributing factor. The final LVI is calculated after obtaining the value of exposure, sensitivity and adaptive capacity by combining these three factors using the following equation;

$$LVI_c = (e_c - a_c) * s_c$$

Where e is the calculated exposure score, a is the calculated adaptive capacity and s is the calculated sensitivity for community, c. In other words, LVI is calculated as exposure—adaptive capacity multiplied by the sensitivity.

Table 1: List of parameters used to derive the livelihood vulnerability Index (LVI).

| Contributing Factors | Major components | Sub-components |
|---|---|---|
| Adaptive Capacity<br><br>Systems ability to resist and/or recover from exposure | Socio-demographic profile | Active population |
| | | Able population |
| | | Literacy rate |
| | Livelihood strategies | Proportion of people involved in off farm income and employment activities |
| Sensitivity<br><br>Degree to which the system is affected due to exposure | Water availability | Proportion of households without piped drinking water |
| | Health | Distance to nearest health service center |
| | Food sufficiency situation | Proportion of households with less than six month food sufficiency |
| | Communication | Proportion of households without radio |
| | | Proportion of households without telephone |
| | Accessibility | Distance to nearest market center |
| | | Distance to road |
| | Population size | Total population size of the settlement |
| Exposure<br><br>Potential harm to people, property, environment and livelihood bases | Water-induced disasters | Area damaged by landslide |
| | | Crops damaged by landslide |
| | | Households affected by landslide |
| | | Area damaged by flood |
| | | Crops damaged by flood |
| | | Households affected by flood |

## Methods and materials

The study is primarily based on primary data collected in the field. Field surveys were conducted using questionnaires, key informant interviews, and Participatory Rural Aprasal (PRA) tools, specifically focus group discussions, participatory social mapping and observation. A detailed household questionnaire was randomly administered to about 10 percent of the households from the 25 settlements of the five Villge Development Committees (VDC)s.

Focused Group Discussion (FGD) was conducted in all 25 settlements. This yielded settlement-level information on hazard scenarios, loss and damage due to past hazards (Figure 1) and groups affected, which was used to calculate the vulnerability index.

## Study area

The study area consists of five VDCs namely; Marbu, Chankhu, Suri, Khare, and Jhyaku of Dolakha district. With an area of 323km$^2$, the region is also known as the Khare-Suri khola watershed and is located in the northern part of the Dolakha District. With elevations ranging from 874masl to 6599masl, (Figure 2), the area is highly susceptible to various hazards. Landslides, flash floods, glacial lake outburst floods, drought and soil erosion are the main natural hazards found here. The area comprises the upper part of the Tamakoshi River and is downstream of the Tsho Rolpa glacial lake. Total population of the study area is about 12,000, divided into approximately 2,700 households. Three main indigenous groups inhabitthe area, namely, *Chhetree, Brahmin* and *Dalit*, comprising 60, 30 and 10 percent of the total, respectively. Importantly, Surel, who make their home in this watershed, is one of the 59 recognized indigenous communities in Nepal.

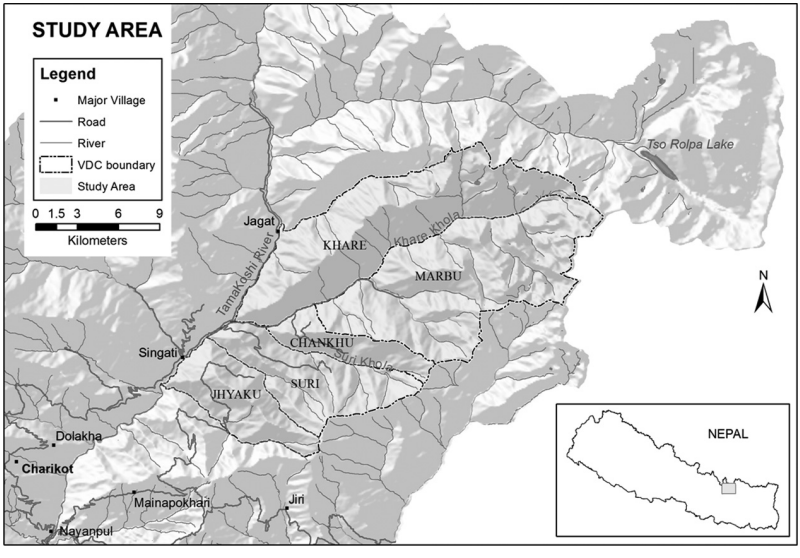


Figure 2: Location of the study area

## Discussion and findings

### Loss and damage by climate change induced flood and landslide hazards

Settlements along the river banks of the upper Tamakoshi basin are vulnerable to landslides, floods and GLOF hazards. The history of hazards in the study area shows that, with respect to loss of life and property, Jhyaku is the most vulnerable followed by Chankhu, Marbu, Suri and Khare.

During the focus group discussions, it was revealed that major hazard events have taken place in 1985 (2042 BS), 1997 (2053 BS) and 2010 (2067 BS), primarily because of intense rainfall. Small landslides and floods are common, annual events.

The 1985 landslide event hit Jhyaku VDC the hardest. It claimed the lives of 49 people, 25 males and 24 females, and many people were injured. Hundreds of domestic animals were killed and 19 houses sustained serious damage. The most affected settlements were Phalante, Langur, Sersepu, Mahatara, and Khamedada with the villagers expressing that most of the areas had either slipped or were covered by landslide debris.

Many more landslide events took place after 1985, with the most devastating in 1997. In this year, it was Jhyaku VDC that again sustained comparatively more damage compared to other VDCs. It took place in the night and people recalled the debris and water flowing everywhere through the villages. The total human death toll was 23, 14 males and 9 females. 16 were injured, 13 houses were destroyed, and 285 domestic animals were killed.

Chankhu VDC is another highly landslide-prone VDC of the area. A major landslide event takes place almost regularly in different years and in different villages. Among the various events, the one in 2001 was the most devastating and it took place in Doje of ward No. 9, claiming the lives of 2 males and 9 females. Seven houses were destroyed and many domestic animals were also killed.

Marbu is another disaster-prone VDC. The major events occurred in 1985, 2001, 2008 and 2011. The event of 1985 affected Tokdin settlement of Marbu where all 10 households of the village were shifted to another place in the village. The 2001 landslide event affected Gongata where 3 houses were destroyed and 10 animals were killed.

Suri VDC is not exempt to landslide hazards either. A major event took place in 1997 in which three males and one female were killed in Jyaduli. One house was damaged and many domestic animals were killed. Many people were injured. Another major landslide took place in Mulabari in 2010 and damaged land and crops. The details of loss of cultivated area, crops and houses are in in the Table 2.

Table 2: Loss of land and crop by landslide after 1997

| VDC | Settlements | Affected households and damaged area (ropani) and crops (muri) | | |
|---|---|---|---|---|
| | | HH | Area | Crop |
| Suri | Kapti | | 9 | |
| | Kasika | | 5 | |
| | Surigaun | | 15 | |
| | Tinekhu | 1 | 31 | 10 |
| Chankhu | Hulak | | 52 | 25 |
| | Chankhu | 5 | 73 | 31 |
| | Bothu | | 22 | 9 |
| | Doje | 7 | 75 | 45 |
| Marbu | Gangata | 4 | 50 | 22 |
| | Hupchi | | | |
| | Marbu | 14 | 58 | 19 |
| | Sikpaswor | | | |
| Khare | Manthali* | | | |
| | Manedanda | | 10 | |
| | Kaseri | 1 | 21 | 30 |
| | Chhesakhare | | 25 | 30 |
| Jhyaku | Ghattepu | | 50 | 15 |
| | Gorpan | 7 | 200 | 55 |
| | Manedanda2 | 4 | 110 | 15 |
| | Yarsa | 1 | 30 | 10 |
| | Jhyaku | | 40 | 17 |
| | Mahatara | | 35 | 10 |
| | Sersepu | | 75 | 30 |
| | Garding | 1 | 105 | 35 |
| | Saune | | | |
| **Total** | | **45** | **1091** | **408** |

Source: UNDP Nepal, 2012.

The total loss of cultivated land was 1091 ropani and 408 muri cereals. As people said that the damaged area is very much higher than this because many landslides took place in forest and common land that is under reported and it was also not counted several small landslides considering as a usual phenomenon. Crop damage is far lesser because farmers had just planted rice on khet land so its production was not counted.

Although not directly affecting the village or cultivated land, the Kotase landslide, which occurred in 2010, in the nearby Manedadagaun forest, could potentially affect the micro-hydro project down-stream and the cultivated land along the Upper Tamakoshi Road that runs along the Tamakoshi River. Another major landslide at Chhesakhare, which also happened in 2010, threatened to claim four houses, at the top of the release area and damage cultivated land down slope along the zone of deposition.

The assessment of past landslide and flood events shows that there is a certain interval of reoccurrence of the major events. For instance, a major event took place in 1985, followed by the 1997 event of the same magnitude and then another, lesser landslide in 2008. All three of these major events affected much of Jhyaku, Chankhu, and Marbu with effects felt in other VDCs as well.

### Climate change-induced livelihood vulnerability

Livelihood vulnerability of all 25 settlements is derived based on their exposure, sensitivity and adaptive capacity. These three indices are separately calculated and subsequently combined to achieve the overall LVI index based on the above mentioned six sub-components (see Table 1).

The exposure, sensitivity and adaptive capacity are divided into three levels; i.e. high, medium and low. The high level is defined as an above average index plus one standard deviation of the index value. Medium is defined as between the average index value and the average index plus one standard deviation of the index, and low is defined as below the average index value.

As per Table 3, four settlements, namely Gorpan of Jhyaku, Manthali-Jamune of Khare, Doje of Chankhu, and Marbu of Marbu, have a high enough LVI value to indicate high exposure.

Table 3: Exposure, sensitivity and adaptive capacity score and level by settlement

| VDC | Settlements | Exposure | | | Sensitivity | | | Adaptive Capacity | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Exposure_SC | Exposure _Level | Ranking | Sensitvity_SC | Sensit_Level | Ranking | Adaptive Capacity_Sc | Adaptive Level | Ranking |
| Suri | Kati | 0.02 | Low | 20 | 0.80 | High | 4 | 0.77 | High | 22 |
| | Kasich | 0.01 | Low | 22 | 0.66 | Medium | 5 | 0.64 | Medium | 18 |
| | Surgeon | 0.03 | Low | 19 | 0.60 | Medium | 7 | 0.65 | Medium | 19 |
| | Tanesha | 0.16 | Low | 16 | 0.41 | Medium | 10 | 0.51 | Low | 13 |
| Chankhu | Hula | 0.29 | Low | 11 | 0.90 | High | 2 | 0.46 | Low | 11 |
| | Chankhu | 0.51 | Medium | 6 | 0.30 | Low | 16 | 0.60 | Medium | 16 |
| | Both | 0.11 | Low | 18 | 0.08 | Low | 22 | 0.66 | Medium | 20 |
| | Done | 0.68 | High | 3 | 0.32 | Low | 14 | 1.00 | High | 25 |
| Marbu | Gongata | 0.37 | Medium | 9 | 0.27 | Low | 17 | 0.00 | Low | 1 |
| | Hutchie | 0 | Low | 23 | 0.40 | Low | 11 | 0.26 | Low | 4 |
| | Marbu | 0.65 | High | 4 | 0.61 | Medium | 6 | 0.44 | Low | 10 |
| | Sikpaswor | 0 | Low | 24 | 0.88 | High | 3 | 0.36 | Low | 6 |
| Khare | Manthali | 0.94 | High | 2 | 0.26 | Low | 18 | 0.38 | Low | 7 |
| | Manedanda | 0.02 | Low | 21 | 0.00 | Low | 25 | 0.83 | High | 14 |
| | Kaseri | 0.29 | Low | 12 | 0.25 | Low | 19 | 0.62 | Medium | 17 |
| | Hhesakhare | 0.27 | Low | 13 | 0.54 | Medium | 8 | 0.51 | Low | 12 |
| Jhyaku | Ghattepu | 0.21 | Low | 14 | 1.00 | High | 1 | 0.35 | Low | 5 |
| | Gorpan | 1 | High | 1 | 0.35 | Low | 13 | 0.67 | Medium | 21 |
| | anedanda2 | 0.51 | Medium | 7 | 0.17 | Low | 21 | 0.53 | Medium | 24 |
| | Yarsa | 0.16 | Low | 17 | 0.21 | Low | 20 | 0.58 | Medium | 15 |
| | Jhyaku | 0.2 | Low | 15 | 0.47 | Medium | 9 | 0.78 | High | 23 |
| | Mahatara | 0.54 | Medium | 5 | 0.32 | Low | 15 | 0.23 | Low | 2 |
| | Sersepu | 0.37 | Medium | 10 | 0.02 | Low | 23 | 0.39 | Low | 8 |
| | Garding | 0.49 | Medium | 8 | 0.01 | Low | 24 | 0.41 | Low | 9 |
| | Saune | 0 | Low | 25 | 0.37 | Low | 12 | 0.23 | Low | 3 |

Source: UNDP Nepal, 2012.

The high level of exposure level is attributed mainly to exposure to damage by landslides, except the village of Manthali-Jamune where floods tend to cause most of the damage.

Settlements with medium exposure levels are Manedanda, Mahatara, Sersepu, and Garding of Jhyaku, Gangata of Marbu, and Chankhu village of Chankhu VDC. The exposure level of the 15 remaining villages is low. Amongst these villages, the score for Hulak, Kaseri, Chhesakhare and Ghattepu, is very close to the medium level (Figure 2).

It is important to mention here that out of the nine major settlements of Jhyaku VDC, one settlement has a high level of exposure level and four settlements have a medium level of exposure. level.

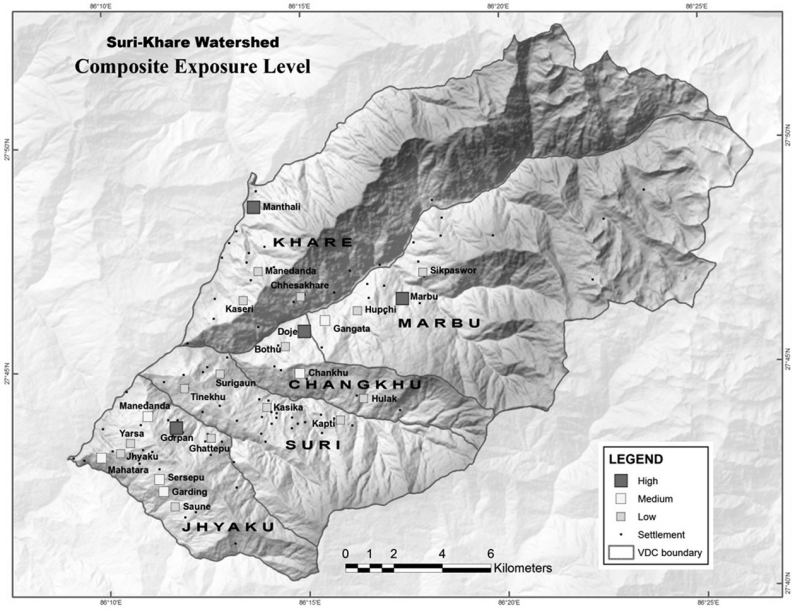


Figure 2: Composite exposure level by settlements

The sensitivity score levels are high for Kapti, Hulak, Sikpaswor and Ghattepu of Suri, and Chankhu, Marbu of Jhyaku VDC (Table 3, Figure 3). Seven settlements have a medium level of sensitivity, namely Kasika, Surigaun and Tinekhu of Suri VDC, Marbu of Marbu VDC, Chhesakhare of Khare VDC, and Jhyaku of Jhyaku VDC. The sensitivity level of the remaining 15 villages is low (Table 3, Figure 3).

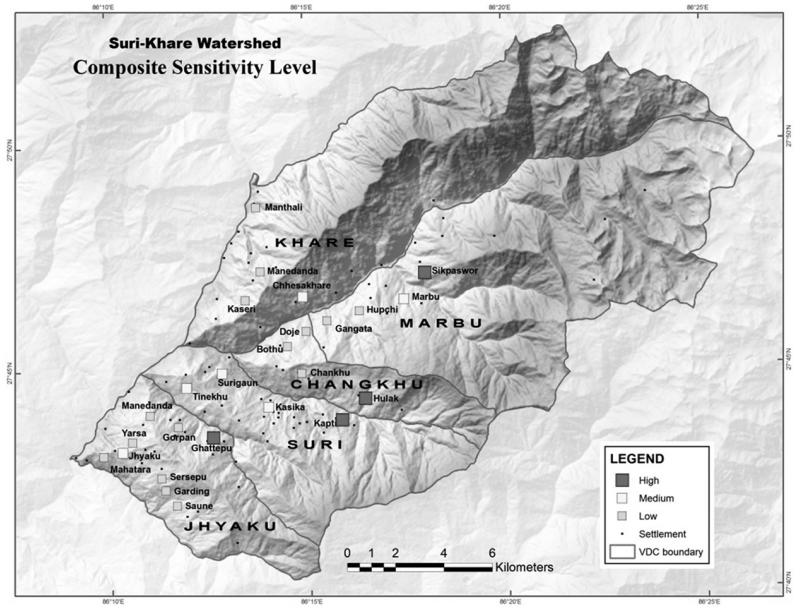


Figure 3: Composite sensitivity level by settlements

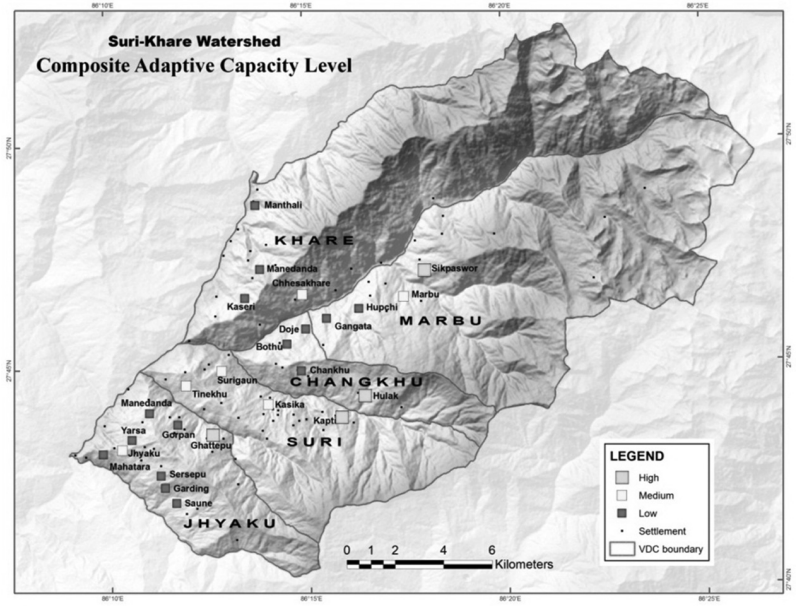


Figure 4: Composite adaptive capacity level by settlements

Adaptive capacity is the post-hazard ability of a village to recover from hazards. It is calculated based on off-farm employment, literacy rate, and proportion of able and economically active population. The adaptive capacity level is low for 13 villages, medium for eight villages and high for the remaining four villages. (Table 5.15, Table 3, Figure 4).

### The Overall Livelihood Vulnerability (LVI)

Finally, the LVI is calculated by combining the index values of all the three factors, i.e. exposure, sensitivity and adaptive capacity. As per Table 4, the LVI level is high for five settlements, medium for six villages and low for 14 villages.

Table 4: Final LVI score, vulnerability level and ranking of settlement

| VDC | Settlements | LVI Score | LVI Level | Ranking |
|---|---|---|---|---|
| Suri | Kapti | 0.00 | Low | 25 |
| | Kasika | 0.20 | Low | 24 |
| | Surigaun | 0.23 | Low | 23 |
| | Tinekhu | 0.50 | Low | 16 |
| Chankhu | Hulak | 0.44 | Low | 20 |
| | Chankhu | 0.65 | Medium | 9 |
| | Bothu | 0.53 | Low | 14 |
| | Doje | 0.45 | Low | 19 |
| Marbu | Gangata | 0.99 | High | 2 |
| | Hupchi | 0.61 | Medium | 11 |
| | Marbu | 0.77 | Medium | 7 |
| | Sikpaswor | 0.35 | Low | 21 |
| Khare | Manthali | 1.00 | High | 1 |
| | Manedanda | 0.45 | Low | 18 |
| | Kaseri | 0.55 | Low | 12 |
| | Chhesakhare | 0.51 | Low | 15 |
| Jhyaku | Ghattepu | 0.48 | Low | 17 |
| | Gorpan | 0.82 | High | 5 |
| | Manedanda2 | 0.74 | Medium | 8 |
| | Yarsa | 0.54 | Low | 13 |
| | Jhyaku | 0.30 | Low | 22 |
| | Mahatara | 0.92 | High | 3 |
| | Sersepu | 0.80 | Medium | 6 |
| | Garding | 0.83 | High | 4 |
| | Saune | 0.64 | Medium | 10 |

Source: UNDP Nepal, 2012.

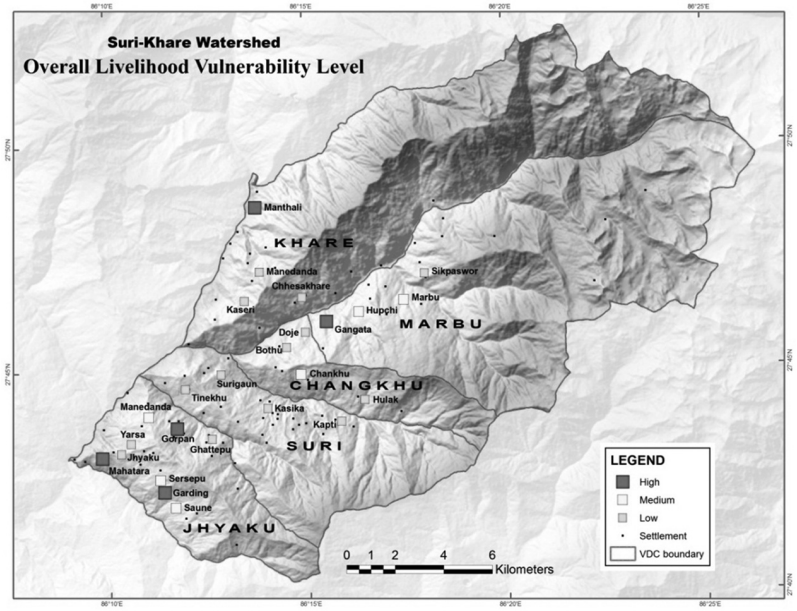


Figure 5: Overall LVI by settlement

## Who are the most vulnerable?

Many studies (Smit, et al. 2007; Oxfam, 2009; Dulal, 2010; Ninan and Bedamatta, 2012) conclude that climate change can affect different groups of people, very differently. The studies also concluded that the effects are more pronounced on the poor, marginalized, disadvantaged, and particularly women. The intent of this study, is to identify the settlements that are more vulnerable, within the context of caste and ethnicity.

It is clear from past landslide events, that the death toll of women is higher than for men. Vulnerability is directly related to social demographics because different groups have different access to resources and therefore a different capacity to respond. The population in the study area is comprised of Indigenous peoples (55%), Chhetree/Brahman (30%), Dalit (Kami, Damai and Sarki) (9%) and Newar (6%). At the VDC level, more than two thirds of the total population is indigenous peoples in three VDCs namely Marbu, Chankhu and Khare (Tables 5 and 6).

Table 5: Caste ethnic composition of population by VDC

| VDC | Brahman Chhetree | | Hill Indigenous peoples | | KDS | | Newar | | Others | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Popn | % | Popn | % | Popn | % | Popn | % | Popn | % | Popn |
| Chankhu | 14 | 1.1 | 1039 | 81.3 | 203 | 15.9 | 20 | 1.6 | 2 | 0.2 | 1278 |
| Jhyaku | 2288 | 49.3 | 2053 | 44.3 | 281 | 6.1 | 6 | 0.1 | 9 | 0.2 | 4637 |
| Khare | 308 | 16.8 | 1186 | 64.7 | 69 | 3.8 | 264 | 14.4 | 6 | 0.3 | 1833 |
| Marbu | 70 | 5.0 | 993 | 70.5 | 170 | 12.1 | 163 | 11.6 | 13 | 0.9 | 1409 |
| Suri | 1027 | 33.6 | 1421 | 46.5 | 345 | 11.3 | 250 | 8.2 | 11 | 0.4 | 3054 |
| Total | **3707** | **30.4** | **6692** | **54.8** | **1068** | **8.7** | **703** | **5.8** | **41** | **0.3** | **12211** |

Source: CBS, 2012.

Additionally, there is a significant percentage (above 10%), of Dalit population who are socio-culturally at the lowest level of the traditional social structure and are considered untouchable. Economically, they are poorer as they primarily depend on their traditional jobs in service to other castes, i.e. Kami on making iron agricultural tools; Damai on tailoring; and Sarki on making shoes. Furthermore, they are at a relatively lower position in terms of ownership of improved houses and land, access to financial institutions and education, and employment in government jobs (Chapagain et al, 2014a; Chapagain et al., 2014b; Gurung, et al., 2014).

A high level of livelihood vulnerability was observed for five settlements, namely Gorpang, Manthali, Gangata, Mahatara and Garding, where more than 90 percent of the population is comprised of Sherpa, Tamang, Gurung, Magar and KDS (Kami, Damai, Sarki). Medium vulnerability was observed for Chankhu, Hupchi, Marbu, Manedanda, and Saune where more than two thirds of the households are Sherpa, KDS and Tamang (Table 6, and Figure 5). Field observations and focus group discussions also uncovered that major landslides have taken place at a regular interval of about ten years because of extreme rainfall in the highly vulnerable settlements. Landslide events seriously undermine the resource base and livelihood of a community by damaging and/or destroying agricultural lands, livestock and houses.

Table 6: Households by caste/ethnicity in the study settlements

| VDC | Settlement | Household | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Brahman - Hill | Chhetree | Gharti | Gurung | Jirel | Magar | Newar | Sherpa | Tamang | KDS | Surel | Total |
| Chankhu | Hulak | | 1 | | | | | | 107 | 5 | 2 | | 115 |
| | Chankhu | 1 | 1 | | 15 | | | 15 | 65 | 15 | 35 | | 147 |
| | Bothu | | | | | | | | | 47 | | | 47 |
| | Doje | | | | 20 | 2 | | | | 11 | | | 33 |
| | Sub Total | 1 | 2 | 0 | 35 | 2 | 0 | 15 | 172 | 78 | 37 | 0 | 342 |
| Jhyaku | Ghattepu | | 32 | | | | | | 95 | 15 | 1 | | 143 |
| | Gorpan | | 19 | | | | | | 79 | | 4 | | 102 |
| | Manedanda | 5 | 69 | | | | | | 15 | | 20 | | 109 |
| | Yarsa | | 35 | 2 | | | | | | 60 | 9 | | 106 |
| | Jhyaku | 4 | 47 | 2 | | | | 1 | | 69 | 4 | | 127 |
| | Mahatara | | 60 | | | | | | | | 3 | | 63 |
| | Sersepu | | 65 | | | | | | 27 | | 16 | | 108 |
| | Garding | | 75 | | | | | | | | | | 75 |
| | Saune | 4 | 89 | | | | | 1 | 39 | | 5 | | 138 |
| | Sub Total | 13 | 491 | 4 | 0 | 0 | 0 | 2 | 255 | 144 | 62 | 0 | 971 |
| Khare | Manthali | | 20 | | | | | 20 | | 25 | 2 | | 67 |
| | Manedanda | | 20 | | 15 | | | 21 | | 26 | 5 | | 87 |
| | Kaseri | 5 | 35 | | | | | 19 | 5 | 15 | | | 79 |
| | Chhesakhare | | 15 | | | | 20 | 25 | 15 | 25 | | | 100 |
| | Sub Total | 5 | 90 | 0 | 15 | 0 | 20 | 85 | 20 | 91 | 7 | 0 | 333 |
| Marbu | Gangata | 1 | 8 | 5 | 45 | | 5 | | | 4 | 4 | | 72 |
| | Hupchi | 1 | 4 | | 10 | | 2 | | 22 | | 19 | | 58 |
| | Marbu | | | | 20 | | 10 | 7 | 58 | 9 | | | 104 |
| | Sikpaswor | | | | 5 | | 15 | 15 | 47 | | 9 | | 91 |
| | Sub Total | 2 | 12 | 5 | 80 | 0 | 32 | 22 | 127 | 13 | 32 | 0 | 325 |
| Suri | Kapti | | 27 | | 46 | | | | 47 | | 25 | | 145 |
| | Kasika | 5 | 79 | 15 | | | | 20 | 42 | 5 | 25 | | 191 |
| | Surigaun | 2 | 68 | 2 | 2 | | | 25 | | 50 | 30 | 30 | 209 |
| | Tinekhu | 1 | 55 | | | | | | | 115 | 5 | | 176 |
| | Sub Total | 8 | 229 | 17 | 48 | 0 | 0 | 45 | 89 | 170 | 85 | 30 | 721 |
| **TOTAL** | | **29** | **824** | **26** | **178** | **2** | **52** | **169** | **663** | **496** | **223** | **30** | **2692** |

Source: Key Informant Survey, 2014.

## Conclusion

As a direct consequence of climate change, the Himalaya region has experienced an increase in temperatures and in the frequency of extreme rain events. The consequences of these increases are more frequent landslides and flood events which damage agricultural land, houses, crops and most significantly, kill or injur disproportionately more poor and marginalized people.

The upper Tamakoshi is a high altitude basin where people depend mainly on agro-pastoral production. It is geographically remote and difficult to access and the majority of the people are of indigenous origin. Between 1985 and 2011, three major events took place that triggered many large landslides which claimed the lives of about 90 people and injured hundreds more. Hundreds of domestic livestock were also killed. Out of the 25 settlements in the study area inhabited by Sherpa, Tamang, Gurung and Dalit (Kami, Damai and Sarki), five are highly vulnerable and six are categorized as having medium vulnerability. The study area is downstream of the Tsho-Rolpa Glacial Lake where GLOF risk is very high. According to a recent ICIMOD study, this lake has been categorized as one of the most potentially dangerous lakes in Nepal. Further studies are recommended on how vulnerable groups with similar livelihood strategies in different ecological zones are affected by climate change with a focus on their adaptation strategies.

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# Women's Roles in Addressing the Issues of Climate Change

# Diversity in Situation and Role of Indigenous Women in Addressing Climate Change in Nepal

**Yasso Kanti Bhattachan**

## Introduction

In Nepal, there is growing interest among social scientists, environmentalists, journalists and activists about the various aspects of climate change relating to indigenous peoples. This stems from an apparent lack of literature about issues relating to the customary adaptation and mitigation practices of indigenous women experiencing the impacts of climate change. Karki & Adhikari (2014), wrote an opinion article in the Republica, a daily broadsheet, that "Climate Adaptation Challenges Indigenous practices in Nepal are applied to forest and pasture management, drinking water and irrigation system management, medicinal plants-based primary health care (Auyrveda, Amchi, Yunani), development of climate compatible houses and suspension bridges, and improvement of local trekking trails."[1] The authors maintain that these practices are crucial to the subsistence and survival of local, indigenous peoples. Indigenous practices are generally considered gender sensitive and socially inclusive. Karki and Adhikari (2014), have noted that "Females collect branches of trees and twigs, grass and leaves as fodder and leaf litter for animal beddings, whereas males collect wood for timber, big tree branches, firewood, poles for house building as well as for construction purposes" and "Men dig and maintain irrigation channels and women supply food and collect branches and twigs to build trash dams."

This article first discusses the diversity of indigenous women and their

roles, followed by a few examples of the direct roles indigenous women play in addressing climate change.

### Diversity of Indigenous Women and Diversity in their Roles

The roles of women differ from those of men not only in public and private spheres but also in addressing climate change. Additionally, the 59 indigenous groups of Nepal also have unique ways of dealing with the impacts of climate change.

(i) *Different categories of indigenous peoples at different stages of development, adaptation and mitigation*: The Nepal Federation of Indigenous Nationalities (NEFIN) has categorized 59 indigenous peoples into five categories based on development indicators such as income, literacy and education and wealth, including land and house ownership.

**Categorization of Indigenous People based on development[2]**

| | |
|---|---|
| **Advanced Group (2)** | Newar, Thakali |
| **Disadvantaged Group (14)** | BarahgaunleThakali, Byansi, Chhantyal, Gurung, Jirel, Limbu, Magar, MarphaliThakali, Rai, Sherpa, Tangbe, TeengaunleThakali, Yakkha, Yolmo |
| **Marginalized Group (19)** | Bhote, Darai, Bhujel, Dhimal, Dura, Dolpo, Gangaai, Kumal, Larke, Lohpa, Mugal, Pahari, Rajbanshi, Sunuwar, Tamang, Tajpuriya, Tharu, Topkegola, Walung |
| **High Marginalized Group (12)** | Bote, Baramu, Chepang, Danuwar, Dhanuk, Jhagad, Majhi, Lhomi (Shinsaba), Santhal Siyar,, Thami, Thundam, |
| **Endangered Group (9)** | Bankariya, Hayu, Kisan, Kuswadiya, Kusunda, Lepcha, Meche, Raute, Raji, Surel |

Women belonging to any of the indigenous groups within these five categories may have different status in terms of their needs, interests, roles, responsibilities, and gender-related power relations in addressing climate change issues. They all differ immensely in terms of their awareness, education and training, finding alternatives, accessing and mobilizing

resources, building networks and external linkages, using political power to bring about favorable government policies, programs and budget, collective efforts and resistance relating to adaptation, mitigation and other issues of climate change. Indigenous women belonging to the advanced and disadvantaged groups are in relatively better position to mobilize national and international resources compared to those belonging to the marginalized, highly marginalized and endangered categories, mainly because the former are better organized in the capital city of Kathmandu and have much better access to resources.

*(ii) Different categories of indigenous peoples in different regions*: Indigenous peoples live in different eco-regions, development regions and rural-urban locations. These regions are:

**(i) Eco-regions**

**(A) Mountain** (1) Bara Gaunle, (2) Bhutia, (3) Byansi, (4) Chhairotan, (5) Dolpo, (6) Larke, (7) Lhomi (Shingsawa), (8) Lhopa, (9) Marphali Thakali, (10) Mugali, (11) Siyar, (12) Tangbe, (13) Thakali, (14) Thudam, (15) Tingaunle Thakali, (16) Topkegola, (17) Sherpa, and (18) Wallung.

**(B) The Hill** (1) Bankaria, (2) Baramo, (3) Bhujel/Gharti, (4) Chepang, (5) Chhantyal, (6) Dura, (7) Fri, (8) Gurung, (9) Hayu, (10) Hyolmo, (11) Jirel, (12) Kushbadia, (13) Kusunda, (14) Lepcha, (15) Limbu, (16) Magar, (17) Newar, (18) Pahrí, (19) Rai, (20) Sunuwar, (21) Surel, (22) Tamang, (23) Thami, and (24)Yakkha.

**(C) Inner Terai** (1) Bote, (2) Danuwar, (3) Darai, (4) Kumal, (5) Majhi, (6) Raji, and (7) Raute.

**(F) Terai** (1) Dhanuk (Rajbanshi), (2) Dhimal, (3) Gangai, (4) Jhangad, (5) Kisan, (6) Meche, (7) Rajbanshi (Koch), (8) Satar/Santhal, (9) Tajpuria, and (10) Tharu.

(ii) Development regions: (i) Eastern; (ii) central; (iii) western; (iv) mid-western; (v) far-western;

(iii) Rural-Urban locations: Most of the indigenous peoples live in rural areas, however, some live in urban areas to make a living, engage in education or to have better access to other resources and facilities. The Newars, for example, generally live in urban areas.

Although indigenous women in different eco-regions, development regions and rural/urban locations, generally face common problems related to climate change regarding prospects of adaptation and mitigation, there are significant differences as well. The Government's policies, plans, programs and budgets generally ignore or discriminate against people living in the mountains, the Terai and in the mid-western and far-western development regions as well as rural areas. Indigenous women (and men) in these regions have limited access to resources for undertaking activities that contribute to the adaption to and mitigation of problems brought about by climate change. This means that whatever activities are undertaken to address climate change impacts, are done through own their own initiative, knowledge and resources without any support from the State.

The IIDS (2002), identified seven categories of indigenous peoples based on their continuing pursuit of economic strategies. These are:

**(a) Nomads**: **The Rautes**

**(b) Foraging and Horticulture**: Bankaria; Chepang; and Kusunda;

**(C) Foraging, Horticulture and Agriculture**: Hayu; Raji; and Thami;

**(D) Horticulture and Agriculture:** Baramo; Bhujel; Chantyal; Dura; Fri; Lapcha; Limbu; Magar; Pahari; Rai; Sunuwar; Surel; Tamang; and Yakkha;

**(E) Pastoralism, Agriculture and Industrial Activities:** Bara Gaunle; Byansi; Chairotan; Gurung; Jirel; Larke; Siyar; Tangbe; Thakali, and Tin Gaunle Thakali;

**(F) Agriculture:** Bote; Danuwar; Darai; Dhanuk (Raj); Dhimal; Gangai; Jhangad; Kisan; Kumal; Majhi; Meche; Santhal; Rajbanshi; Tajpuria; Tharu;

**(G) Agriculture and Industrial Activities:** Marphalis Thakali; Newar; and Thakali;

*(iii) Different categories of indigenous peoples at different stages of customary practices*: Indigenous women belonging to these categories also have different strategies for adapting to and mitigating the problems of climate change. Despite negligent and unsupportive government policies towards indigenous peoples in terms of their

land and resources, they, through their own customary practices (e.g: shifting cultivation and alternate arrangements), are getting better at adapting to and mitigating the problems of climate change. This has resulted in indigenous women coping with the effects of climate change in their micro sphere of the household, farmstead, locality and community without any technical, financial and material support from the State.

The Nepal Government, NEFIN and international development partners have not formally categorized indigenous peoples of Nepal based on the degree to which each group continues to employ customary practices. Based on personal observations, four categories of customary practices are suggested: (i) Extinct (such as of the Baramus), (ii) At the verge of extinction or endangered (such as of the Magars and Gurungs), (iii) Weakening (such as of the Limbus and Tamangs), and (iv) Relatively strong (such as of the Tharus, Newars and Thakalis). Due to existing intra-household and intra-community gender relations, indigenous women belonging to these four categories may have different roles in addressing the effects of climate change.

The Government's list reveals nothing about the situation of indigenous peoples in terms of developmental stages or continuation of customary practices. NEFIN's categories are used widely by the Government, international aid agencies and indigenous peoples' organizations. While it is indeed beneficial to improve on development indicators, they can also be damaging by weakening the customary practices and distinct collective identity of indigenous peoples. Those belonging to advantaged categories have gradually lost their customary practices while those in the highly marginalized category have mostly continued their customary practices. The IIDS list provides limited information about the situation of customary practices.

Based on the research teams experience and observations of the situation of customary practices amongst the indigenous peoples of Nepal, the four following stages, in which various indigenous peoples belong, are proposed:

**(1) Relatively strong continuation of customary practices**: Baragaunle; Bhote; Chepang; Dolpo; Larke; Lhoba; Marphali Thakali;; Mugal; Newar; Siyar; Raute; Tangbe; Thakali; Tharu; Thudum;Topkegola; and Walung.

(a) **The nomads:** The Rautes are the last nomadic peoples of Nepal. They live in the forests of the far- and mid-western Hills and Terai of Nepal. They do not live in one place for more than two weeks and keep moving from one forest to another. They rely on hunting (especially Laguna monkey), gathering wood and making wooden products from a special species of trees. Due to climate change and other external factors such as government policies on nationalization of forests, implementation of Raikar land, community forests, national parks, wildlife reserve, and protected areas, and migration to/from different places at different times, they are experiencing difficulty maintaining their customary practices and making a living. Raute men are headmen and the women simply follow them, typical of a patriarchal society where women have little or no power. Due to increasing interventions from various factors including the Government, NGOs, especially those run by the dominant caste groups and development intervention from international aid agencies, Rautes are gradually abandoning their customary practices by heavily relying on financial support from the government to buy goats and foods (rice), and increasingly accepting jobs as forest watchmen, for example.

(b) **Foraging and/or Horticulture and/or Agriculture:** The Chepang continue to practice shifting cultivation but this practice is fading fast as they have lost control over their ancestral land due to national laws and policies regarding land, forest, water, pasture and parks.

(2) **Weakening customary practices**: Gurung; Magar; Rai; Limbu; Tamang; Yakkha; Jirel; Surel; Rajbanshi, Tajpuria; Dhanuk; Sattar/ Santhal; Jhangad/Urau; Gangai; Chantyal; Dura; Majhi; Thami; Hayu; Raji; Sunuwar; Bote; Danuwar; Darai; Meche; and Kisan have lost many of their customary practices.

(3) **At the verge of extinction or Endangered customary practices**: Bankaria

(4) **Extinct customary practices**: Baramu

## Role of Indigenous Women in Addressing the Effects of Climate Change

Floods, landslides, increasing periods of drought, heat and cold waves, melting of Himalayan glaciers, declining snow fall, water scarcity,

increasing the occurrence of insects and diseases, over cutting of timber and fuel wood, degradation of forest and rangeland due to overgrazing have forced men to migrate within the country and abroad for employment and education for adaptation from the negative effects of climate change. Generally women are left behind with the responsibility of looking after the family and farms.

Some of the important roles played by indigenous women of Nepal in addressing the effects of climate change are discussed below.

### Role in adaptation to or reducing effects of food shortage

As in other parts of the world, the indigenous women of Nepal try to reduce the effects of food shortages by reducing the number of meals, consuming wild fruits, practicing starvation, selling labor, seeking employment, seeking the assistance of relatives and friends, selling livestock, poultry keeping, engaging in other non-farm production activities, and planting high yield crops using chemical fertilizers. Most women family members, especially mothers and wives, encourage their sons or husbands to go abroad, particularly to Middle Eastern and South-East Asian countries, as skilled and unskilled laborers. In the absence of male family members, the women solely shoulder the responsibilities of household management and agricultural production.

### Role in the use of alternative fuels to wood for cooking and heating

Generally, indigenous (and non-indigenous) women collect fuel wood from the forest for cooking and heating. The rapid depletion of forest and rangeland due to the combined effects of climate change, encroachment by humans and domestic animals, illegal logging, and the government's policies on forest and rangeland, have placed a heavy burden on indigenous women to collect fuel wood for cooking and heating. In many villages, fuel wood does not last through the whole season. This forces women to travel further over difficult terrain or wait longer to collect detritus wood. Many indigenous groups, for example the Marphali Thakali of Mustang, have recently imposed a rule allowing villagers to collect fuel wood in only one month per year, making it very difficult for households to obtain enough fuel wood to last the year. Through the process of adaption, women have learned to make bio-briquettes by using shrubs, leaf litter and weeds. These require little investment and labor and the raw materials are abundant and easily accessible and the briquettes are easy to make. In

the Terai, especially among the Tharu, Danuwar, Sattar, Urao and others, there is a customary practice of making bio-fuel by mixing and drying cow or water buffalo dung with hay straw for cooking and heating purposes. Also, many indigenous women prefer using stoves by using *bhoos* (rice husk) and firewood. However, some are forced to use kerosene stoves or electric heaters. It is now common for indigenous people to use bio-gas generated from animal dung and bio-waste, LPG/cooking gas and even solar energy technology which is readily available in the market. Electricity in urban areas is expensive and unreliable due to long hours of load shedding (brown outs), but in many villages, micro hydroelectric plants have made electricity readily accessible for long hours; hence some households also use this for cooking purposes. From this perspective, the relative ease of access by women to alternative "clean energy" is found to be having a positive impact on women's reproductive and respiratory health.

***Role in adaptating to or reducing the effects of water shortages***; Most of the mountain indigenous people live either at higher altitudes or on steep slopes compared with those living in the flatter terrains of the Terai. Most rivers in Nepal are snow fed and monsoon-dependent. As the glaciers and snowcaps in the Himalaya continue to melt and shrink and the monsoon pattern changes, causing rivers, streams and wells to dry up, irrigation is becoming an increasing problem. As a result, crop productions are decreasing and drinking water is becoming scarce. The following clips from various media sources give insights into how indigenous women tackle the water shortage problem.

BBC News on 4 July 2004 reported the following:

**"Nepalis bare all to call for rain**

> **"Women in Nepal are reportedly ploughing fields in the nude to please the rain god during a dry spell.**
>
> The Himalayan Times [a local English daily] stated about a dozen Tharu women in south-west Baijapur bared all as concern grows over lack of rain during the rice planting season.
>
> "My mother-in-law said the God would be pleased and make rain fall if women till the land naked," it quoted one of the farmers, Ambika Tharu, 35.

> Men also pray for rain, it said, but keep their clothes on.
>
> Farmers usually finish planting rice by the end of June.
>
> But this year, with no rain and irrigation, land has been lying uncultivated.
>
> Mrs Tharu said tilling the land naked was a tradition which had been observed for generations.
>
> "I dared to bare all to please the God because we will have to face a very difficult situation if it does not rain," she said."[3]

These news postings are evidences of how important water is in the lives of indigenous Nepalese women and apparently they sometimes even go to extremes in an effort to avoid a water shortage.

The Indigenous peoples of Upper Mustang have already experienced the worst effects of climate change though their customary practices are still very strong. The Nepali Times, a local English weekly of 22 July 2010, reported:

"People of Mustang have been forced to migrate from their native land because of the impacts of climate change.

More than half of the 16 families in Samjung and 22 families in Gheya village of Upper Mustang have migrated elsewhere because of climate change, said Bishnu Sharma, a journalist who has been conducting research in the region.

The village springs have dried out and grass has stopped growing in the grazing lands. Consequently, agriculture and livestock rearing have suffered. The villagers complain that with their main sources of livelihood in jeopardy, they had no option but to leave.

Kami Gurung of Gheya village had to descend to Jomsom after he was unable to grow buckwheat and potatoes in his fields. "After all this, staying back in the village is like waiting for death," he said."[4]

This is an example of the differential effects of climate change among indigenous peoples of the mountain region. The lack of drinking water due to the springs having dried out has forced adaptation in the form of migration in the southern regions.

As springs dry up and water becomes scarcer, indigenous women (and men) are now learning the lessons of water conservation by using it in more efficient ways through the adoption of drip irrigation techniques to cultivate vegetables and crops. These techniques have indeed been very successful in increasing and securing food production with little effort. Wealthier indigenous groups, including the Tharus of the Terai and the Newars of the middle valleys, including Kathmandu, are increasingly resorting to drilling deeper wells.

Women are fetching water from increasingly further sources, as part of the adaption practices, and this serves to significantly increase their already high work load. Selling food crops to buy water increases food insecurity but ultimately has net negative effects on the health and wellbeing of girls and women due to the prevalence of patriarchy where boys and men have priority in eating food.

***Role in adapting to or reducing effects of climate change on production activities:*** In Mustang, apple orchards and vegetable farming (cauliflower and cabbage) was not possible until the 1970s. With gradual increases in temperature, these activities became possible in Southern Mustang. The Thakalis, Marphali Thakalis and Tingaunle Thakalis started farming this produce which earned them a relatively good income. With the growing influence of climate change, apple orchards are no longer productive in Southern Mustang. Many farmers are planning to switch to different fruits that are more suitable to the present climate regime. Favourable conditions for apple orchards continue to move north towards northern Mustang. The Gurung women of Khasur village and Bhujel women of Kalleri village in Western Nepal have switched to crops that require less water; to commercial improved seeds; and to commercial vegetables (Sherpa, 2011, pp.106-110).

**Role in adaptation to or reducing the effects of climate change on the environment:**

Many indigenous women of Nepal do play a role in adaptating to or reducing the effects of climate change on the environment by planting trees, conserving forests and engaging in community forestry and natural resources management activities.

## Elements Facilitating Roles Played by Indigenous Women of Nepal in Addressing Climate Change

***Raising of awareness by both governmental and non-governmental organizations:***

Both Governmental and non-governmental organizations have been implementing mitigation and adaption programs and projects related to the impacts of climate change. Invariably, wherever such programs and projects are implemented, one of the key components is to raise awareness of the community members, including women.

### Increasing transportation and communication

Improvements to transportation networks, such as highways, link ways, and green roads, and communications, such as access to mobile phones and WiFi (wireless internet), have made it possible for more people to share ideas, and facilitate the flow of more goods, services and people.

***Increasing Donors' priority:*** International development partners, including the UN, multilateral, bilateral and non-governmental organizations have given high priority to implement adaptation and mitigation mechanisms focused on climate change. In all these programs, priority is given to gender equity and equality; hence, indigenous women are gradually becoming more involved in playing a stronger role in adapting to climate change.

## Elements Impeding Roles Played by Indigenous Women of Nepal in Addressing Climate Change

The main elements impeding indigenous women in Nepal in addressing climate change include inadequate access to veterinary services, production tools, human resources, formal markets, and improved production knowledge.

### Brahamanism

*Bahunbad* (Brahamanism) points to the domination by one caste (Bahun-Chhteri), one sex (male), one language (Khas Nepali), one religion (Hindu), one culture (Hindu) and one region (the Hills). The continued monopoly of power, politics, lands, territories, and resources by this dominant group has resulted in the exclusion of indigenous peoples, women in particular, and environmentalists in general, from participation at all levels of decision making, including those related to climate change.

## Patriarchy

Patriarchy, with origins in the Hindu, religion, society and culture has been another stumbling block for the participation of women in adaptation efforts related to climate change. Due to the domination of Hindu religion and culture for centuries, many indigenous men and women have gone through the process of sanskritization and have adopted gender discrimination which restricts the role of women in the private sphere, both productively and reproductively.

## Violations of human rights and non-implementation of international laws

Nepal is a party to many international laws including the International Covenant on Civil and Political Rights (ICCCPR), the International Covenant on Economic, Social and Cultural Rights (ICESCR), the International Convention on Elimination of Racial Discrimination (ICERD), the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), the International Labour Organization's Convention No. 169 and has adopted the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). However, constitution, laws, policies, programs and strategies are not compatible and reconciled with these international laws and commitments. Violations of human rights of indigenous women and men in Nepal are rampant. It is in this context that the Anchorage Declaration of April 2009 stated "All initiatives under REDD must secure the implementation of the human rights of Indigenous Peoples, including security of land tenure, ownership, recognition of land title according to traditional ways, uses and customary laws and the multiple benefits of forests for climate, ecosystems, and Peoples before taking any action."

## Conclusion

Climate change impacts and the role of indigenous women in addressing these impacts, are some of the least understood issues facing Nepal. Ever-growing awareness and sensitivity to gender issues is one positive sign with respect to women's role in climate change. However, an utter lack of sensitivity regarding the following three points have seriously dampened the constructive role of indigenous women in adapting to and mitigating the effects of climate change. The points are; a) respecting collective rights of indigenous peoples; b) recognition of diversity among

women in gender mainstreaming programs which are implemented by the Government and international development partners and also by the mainstream women's rights movement; and c) lack of sensitivity among indigenous men towards gender equality and equity due to sankritization and Hinduization.

Indigenous women in Nepal play a constructive role in adaptation to and mitigation of the effects of climate change but with the current lack of support from family, and communal, State and development partners, their role is limited.

## Recommendation

Given the diversity of social, ecological and developmental situations in Nepal, there is certainly a need for more research on the issue of climate change, its impact and the role of indigenous women in adaptation and mitigation strategies. Both the Government and international development partners need to address the issue of the role of indigenous women in climate change programs based on the current situation and available evidence regarding their specific practical needs and strategic interests.

## Endnotes

1. http://www.myrepublica.com/portal/index.php?action=news_details&news_id=69392 accessed on 25 March 2014.
2. http://www.nefin.org.np/list/Categorization-of-Indigenous-People-based-on-development-/5/95/6 accessed on 25 March 2014.
3. http://news.bbc.co.uk/2/hi/south_asia/3864185.stm accessed on 25 March 2014.
4. Nepali Times. Issue #511 (16 JULY 2010—22 JULY 2010) http://nepalitimes.com/news.php?id=17269#.Uzy-6cqDdbw accessed on 25 March 2014.

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Further References

# Declarations and Agreements on Climate Change in Relation to Indigenous Peoples

INTERNATIONAL
**INDIGENOUS**
**PEOPLES'**
FORUM ON
CLIMATE CHANGE

**INTERNATIONAL INDIGENOUS PEOPLES' DIALOGUE WITH STATES ON THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC) NEGOTIATIONS**

**Bonn, Germany, 17 October 2015**

**Key demands**

**RESPECT FOR HUMAN RIGHTS, INCLUDING THE RIGHTS OF INDIGENOUS PEOPLES IN CLIMATE CHANGE POLICIES AND ACTIONS**

Parties should ensure an overarching human rights approach to all climate change interventions, procedures, mitigation strategies and adaptation. The operational provisions of the Paris Agreement as well as the COP decisions that will provide guidance for the implementations of the deliberations adopted in COP21 should specifically require Parties to respect, protect, promote, and fulfill the rights of Indigenous Peoples as provided in the UNDRIP, ILO Convention No. 169, the International Convention on the Elimination of Racial Discrimination, and General Recommendation 23 of CERD. There are some solutions to climate change such as those under the Clean Development Mechanism (CDM) that have serious implications to the rights of indigenous peoples. Therefore, it is imperative that Parties

recognize and respect the rights of indigenous peoples to their lands, territories and resources, traditional livelihoods, sustainable resource management systems, cosmovisions, and their Free, Prior and Informed Consent (FPIC), with the right to say "No". Indigenous peoples living in voluntary isolations must to be protected in their territories from extractive industries and other projects.

Building from the Cancun agreement, clear and robust safeguards must be integrated into any future global climate change Post-2015 agreement. The Subsidiary Bodies should be given a mandate to develop modalities and methodologies on how to fully integrate and operationalize human rights based approach in climate change policies and actions, including the rights of indigenous peoples.

The IIPFCC also takes note of the United Nations Sustainable Development Goals (SDGs) and their specific reference to Climate Change in Goal 13. However, it is important for States to recognize that while the SDGs seek to end poverty and hunger in all their forms, the UNFCCC's Structured Expert Dialogue report concludes that the proposed 2°C goal will increase poverty and hunger among Indigenous Peoples. Our food sources, local economies, resilience, and survival are absolutely dependent on the health of the natural world. There must be coherence among a climate change agreement under the UNFCCC, the Sendai Framework for Action on Disaster Risk Reduction, the SDGs, and international human rights standards.

Parties should take urgent action to tackle global warming and climate change and commit to the goal of keeping the global temperature increase below 1.5 C both in the Paris Agreement and in their Intended Nationally Determined Contributions. Parties should ensure the right to equitable benefit sharing in all climate change related activities, taking into account other internationally agreed outcomes/instruments on Access and Benefit Sharing including the Nagoya Protocol.

The governments should commit to reduce emissions and reliance on fossil fuels, promote movement towards deep decarbonization developments such as safe and small scale renewable energy and support other indigenous peoples' initiatives including by means of appropriate technology transfer within the frames of climate justice

Scientific data shows that the collective ownership and integral titling of land, territories and resources of indigenous peoples, as well as respect for customary use and management are the most effective ways of protecting fragile ecosystems and thereby contributing to adaptation and mitigation. Therefore as regards INDCs, its crucial that Parties ensure the participation of indigenous peoples and agree to include indicators that reflect the commitment to recognize and integrate collective rights to territory, autonomy, self-representation, exercise of customary law, non-discrimination and customary Land Use principles. INDCs should also include commitments to respect Indigenous Peoples' rights as well as modalities for reporting on national progress to ensure land titling, concrete measures to control mega drivers, the allocation of public funding to the management of indigenous territories.

**RECOGNIZE INDIGENOUS PEOPLES' TRADITIONAL KNOWLEDGE AND POSITIVE CONTRIBUTIONS TO CLIMATE ADAPTATION, MITIGATION AND RESPECT INDIGENOUS PEOPLES' TRADITIONAL LIVELIHOODS**

The importance of Indigenous Peoples' livelihoods and knowledge in contributing to adaptation and mitigation has been re-affirmed by the IPCC, in its assessment report AR5 on Impacts, Adaptation and Vulnerability. We therefore welcome reference to traditional knowledge and the positive contributions that Indigenous Peoples play in adaptation in the zero draft text of the Agreement but this recognition should be reflected in the mitigation text as well.

An Indigenous Peoples' Experts and "knowledge-holders" Advisory body elected by indigenous organizations and 'indigenous territorial governments" with regional balance, should also be established as a technical advisory body and a consultative resource that contributes the perspective of Indigenous traditional knowledge to the design, implementation, monitoring and evaluation of all UNFCCC subsidiary bodies, activities, mechanisms and programs especially with respect to Indigenous Peoples' related issues. Indigenous Peoples should have full and effective participation in Technical Expert Meetings dealing with pre-2020 ambition.

REDD+ activities must be adjusted to incorporate indigenous proposals and initiatives that look beyond carbon benefits and market-based approaches.

**ENSURE FULL AND EFFECTIVE PARTICIPATION OF INDIGENOUS PEOPLES INCLUDING WOMEN AND YOUTH IN CLIMATE CHANGE-RELATED PROCESSES AND PROGRAMS AT LOCAL, NATIONAL, REGIONAL AND INTERNATIONAL LEVELS**

Indigenous territories are in the frontline of climate change impacts. Engagement in the international bodies is critical and we urge the governments and institutions to ensure the effective engagement, consultation and participation in climate change policies and programs at local, national and regional levels. Indigenous peoples should fully and effectively participate in Safeguards Information Systems, National Forest Monitoring Systems, National Adaptation Programs of Action (NAPA), Disaster Risk Reduction and National Adaptation Plans (NAPs) and Local Adaptation Plans of Action (LAPA), National Designation Authorities (NDAs). In order to accomplish this Indigenous peoples need to have access capacity building and to appropriate technologies. Indigenous Peoples must be part of the loss and damage Executive Committee and must fully and effectively participate in the Adaptation Fund and Advisory Board

**ENSURE DIRECT ACCESS TO CLIMATE FINANCE FOR INDIGENOUS PEOPLES FROM DEVELOPED AND DEVELOPING COUNTRIES**

Indigenous peoples should have direct access to the Green Climate fund through their representative organizations, building on the experience and precedents of other climate funds and must be able to propose, design, implement adaptation and mitigation projects based on their traditional knowledge and livelihoods.

We call on the parties to support our request for the representation of Indigenous Peoples' Organizations (IPOs) as active observers within the Board of the GCF under a differentiated category from nongovernment actors. Furthermore, the GCF should adopt stringent criteria to ensure the effective engagement, consultation and participation of indigenous peoples both in the GCF activities and at all levels.

## ASIA INDIGENOUS PEOPLES' DECLARATION ON THE 21ST SESSION OF THE UNFCCC-CONFERENCE OF PARTIES (COP21)

INA House, Chiang Mai, Thailand
18 September 2015

Indigenous peoples from 12 countries in Asia held a Regional Preparatory Meeting for the 21st Session of the UN Nations Framework Convention on Climate Change (UNFCCC) Conference of Parties (COP21) from 16-18 September 2015 in Chiang Mai, Thailand. The countries include Bangladesh, Cambodia, India, Thailand, Lao PDR, Taiwan/China, Malaysia, Indonesia, Myanmar, Nepal, The Philippines and Vietnam.

There are at least 260 million indigenous peoples in Asia, making it the most culturally diverse region in the world. We, the Asia indigenous peoples, whose homes are in the mountains and forests, the coasts and small islands have the least contribution to the changing of the climate system yet we are severely impacted by climate change. The flooding in Myanmar, the typhoons in the Philippines, the earthquake in Nepal, the drought in Thailand, the haze in Indonesia are some of the catastrophes in the recent past that have resulted to greater food insecurity, destruction of our livelihoods, lands and resources, displacements, serious health problems, increased number of indigenous peoples with disabilities and grave suffering for millions of indigenous peoples in Asia. Further, climate change impacts are exacerbating the difficulties already being faced by our communities including discrimination, displacement, political and economic marginalization, lack of social services and unemployment, among others.

We are aware and we experience an alarming increase in diseases associated with increasing temperatures and vector-borne and water-borne diseases like cholera, malaria and dengue fever; extreme and unprecedented cold spells resulting to health problems (e.g. hypothermia, bronchitis, and pneumonia, especially for the old and young), loss in biodiversity including indigenous species of seeds and plants due to worsening drought and more forest fires. These indications of climate change also adversely affect the traditional livelihoods of indigenous peoples such as subsistence agriculture, shifting cultivation, hunting and gathering, and aggravate crop damaging pest infestations (e.g. rats, giant earth worm), and increase food costs due to competition with the demand for biofuels.

Likewise, we are alarmed and concerned over the increasing cases of human rights violations, displacements and conflicts due to the implementation of so-called climate change solutions being imposed on indigenous peoples without our participation and consent such as the expropriation of ancestral lands and forests for biofuel plantations (sugar cane, palm oil, jatropha, corn and others) as well as for carbon sink, and renewable energy projects (dams, geothermal plants).

We assert that indigenous peoples have so far, been able to manage and protect our resources sustainably throughout the generations. There is no denying the close connection between nature as the source of our life, culture and livelihoods which we indigenous peoples safeguard for our grandchildren's future. We should not be looked upon as just "vulnerable people" but peoples who have invaluable knowledge, values, systems and practices that can provide solutions to climate change.

Aside from our reliance on collective principles, values and worldviews, we have developed coping strategies such as practice of resource-sharing and use of traditional knowledge to locate resources for community use like water; use of traditional self-help methods during disaster; crop diversification to minimize risk of harvest failures; discerning varieties of crops with different susceptibilities to droughts, floods, and pests, or knowing varieties adapted to different locations such as river banks, high mountains, and close to primary forest; improving forest protection and conservation activities, watershed protection and restoration of already degraded ecosystems; adaptation of climate-resilient crops; and awareness-raising and solidarity actions to address the concerns of indigenous peoples.

We are concerned that the global climate change we are now experiencing is the result of the failure of a development model which is contingent on using up natural resources with no consideration for sustainability and social equity. Corporate greed and control over resources have rendered our national decision-makers powerless in the face of pressure from industrialised nations.

Highlighting the indivisibility and importance of political, cultural, social, and economic rights, these consequences especially underline the discrepancy between human rights and environmental governance. It also demonstrates the political divide in approaching the issue of development. It is time to reverse the course of development: to adhere to mutual support, collectivism, spirituality, subsistence and sustainability to which indigenous peoples have always subscribed.

We demand the full and effective implementation of the right to consultation, participation and free, prior and informed consent of indigenous peoples in all negotiation processes, and in the design and implementation of measures related to climate change.

Affirmation to the solutions to address the effects of climate change must be holistic, coherent and respectful of the rights of indigenous peoples. It also should not be limited to Western scientific knowledge, but must include indigenous peoples' traditional knowledge, innovations and practices, which have historically contributed to the efforts of conservation of ecosystems and biodiversity in our territories.

We challenge States to abandon false solutions to climate change that negatively impact on indigenous peoples' rights to their lands, air, oceans, forests and territories. These include nuclear energy, large-scale dams, geo-engineering techniques, "clean coal," agro-fuels, and market-based mechanisms such as carbon trading, the Clean Development Mechanism, and forest offsets.

Any outcome of the negotiations currently being held and the Intended Nationally Determined Contributions (INDCs) should include indicators on the extent to which indigenous peoples' rights and safeguards are respected, and non-carbon benefits are ensured.

We urge Parties to establish a specially dedicated fund to be directly accessed and managed by indigenous peoples from developing and

developed countries to enhance and further develop our adaptation capacities and to strengthen our traditional knowledge and livelihoods, which we have sustained for generations but are now threatened by climate change. Parties should also ensure direct access to already existing climate funds including the Green Climate Fund.

Finally, we call on the States to have the political will to commit to identified targets that will keep the temperature increase below 1.5 C degrees. The common but differentiated responsibilities must be upheld with clear commitments and actions by all parties. This is the time for action! The protection of indigenous peoples and sustainability of the planet are not up for further negotiations.

## INTERNATIONAL INDIGENOUS PEOPLES' FORUM ON CLIMATE CHANGE (IIPFCC)

### Executive Summary of Indigenous Peoples' Proposals to the UNFCCC COP 20 and COP21

**Lima, Peru, Nov. 30, 2014**

### 1. RECOGNITION OF A HUMAN RIGHTS-BASED APPROACH WHICH RESPECTS INDIGENOUS PEOPLES' RIGHTS IN CLIMATE-CHANGE AGREEMENTS AND RELATED ACTIONS

Parties shall ensure a **human rights-based approach** which respects Indigenous Peoples' rights and related safeguards in any future climate change programmes and actions including those that will be adopted in COP21 in Paris. Any agreement shall build and expand on the language contained in Cancun Climate Agreement that represents an initial step towards recognizing the rights of indigenous peoples reflected in the **UN Declaration on the Rights of Indigenous Peoples—**as reaffirmed by the69th session of the UN General Assembly **HLPM/World Conference on Indigenous Peoples (WCIP)** held in New York in September 2014— and other relevant international human rights instruments and standards.

### 2. RESPECT OF INDIGENOUS PEOPLES' RIGHTS TO LANDS, TERRITORIES AND RESOURCES

Indigenous Peoples **rights to lands, territories and resources** must be respected in any climate related action and programme (including mitigation and adaptation actions) that will be agreed in Lima (such as those included

in INDCs) and in the Paris agreement. Parties shall adopt **criteria for reporting on national progress to ensure land and territorial titling, and for concrete measures to address drivers of deforestation and land degradation.** Scientific data shows that the collective ownership and integral titling of land, territories and resources of indigenous peoples, as well as respect for customary use and management are the most effective ways of protecting fragile ecosystems (such as forests, mangroves and glaciers) and thereby contributing to adaptation and mitigation.

### 3. RECOGNITION OF, AND RESPECT FOR, INDIGENOUS TRADITIONAL KNOWLEDGE AND THE ROLE OF INDIGENOUS PEOPLES IN ADAPTATION AND MITIGATION

The importance of **Indigenous Peoples' livelihoods and knowledge in contributing to adaptation and mitigation** has been re-affirmed recently by the (IPCC) in its assessment report (AR5), on Impacts, Adaptation, and Vulnerability. Furthermore, the HLPM/WCIP Conference that took place in September in New York reaffirmed that Indigenous Peoples' knowledge and strategies to sustain their environment shall be respected and taken into account and a coherent approach shall be adopted by the UN to achieve the ends of the UNDRIP.

Parties shall therefore **recognize and protect indigenous peoples' knowledge and cultural heritage,** innovations, technologies, cosmovision, practices, cultural identity, traditional cultural expressions, and spiritual values, which contribute to a climate-friendly livelihood system and biodiversity conservation as well as acknowledge the role of indigenous peoples in adaptation and mitigation. Related application and implementation shall be made possible through adequate financial resources for its application and implementation should be made available. **Non-carbon benefits shall be valued properly and shall be defined within a human rights framework, which respects and recognizes the rights of Indigenous Peoples to lands, territories and natural resources.** Parties shall recognize and support any indigenous proposals/ initiatives on REDD+ that guarantee non-carbon benefits and non-market-based approaches. Parties in Lima shall agree to convene a **workshop on the contribution of indigenous peoples' traditional knowledge to mitigation and adaptation i**n the first half of 2015

## 4. RECOGNITION AND SUPPORT OF INDIGENOUS PEOPLES' COMMUNITY-BASED MONITORING AND INFORMATION SYSTEMS (CBMIS)

Parties must ensure, through the provision of funding and capacity building, that Indigenous Peoples can develop and present their own parallel reports on REDD+ and other climate change-related activities. **Community Based Monitoring Information Systems (CBMIS)** shall be acknowledged, promoted and supported, including within the framework of MRV for mitigation and adaptation. MRV criteria shall include the extent of implementation of social and environmental safeguards, including human rights, equitable benefit sharing, technology transfer and development, finance and REDD+. The methodological guidance on non-carbon benefits and **Safeguard Information Systems** (SIS) must respect, recognize and promote the community-based participatory monitoring and information systems, including traditional knowledge, customary laws, forest management systems and practices of Indigenous Peoples. Among other things, SIS should include indicators on how the demand of Indigenous Peoples for land titling is being achieved, and also report the percentage of the public budget assigned to support the forest management of Indigenous Peoples.

## 5. RESPECT INDIGENOUS PEOPLES' RIGHTS TO FULL AND EFFECTIVE PARTICIPATION IN ALL CLIMATE CHANGE ACTIONS AND UNFCCC INSTITUTIONS

Parties shall recognize and ensure the **full and effective participation** of Indigenous Peoples—including **Free Prior and Informed Consent (FPIC)** in any climate change related actions and programmes. Indigenous Peoples should participate in all UNFCCC decision-making bodies as well as COP negotiations, subsidiary bodies, Technical Expert Meetings (TEMs), financing mechanisms, and capacity building and technology-related bodies. The permanent presence of the **Indigenous Pavilion** in all following COPs should ensure a communications and advocacy platform to make visible indigenous proposals to tackle climate change.

In consultation with Indigenous Peoples, the COP shall set up an **Indigenous Peoples' Experts and knowledge-holders Advisory body** elected by indigenous organizations and indigenous territorial governments with regional balance, which would act as a technical advisory body and a consultative resource that contributes to the design, implementation,

monitoring and evaluation of all UNFCCC subsidiary bodies, activities, mechanisms and programmes especially with respect to Indigenous Peoples' related issues.

### 6. ENSURE INDIGENOUS PEOPLES' DIRECT ACCESS TO FINANCE AND CAPACITY BUILDING

Parties shall ensure **direct access of Indigenous Peoples to finance** through the establishment of a fund dedicated to address the priority needs decided by Indigenous Peoples in developing and developed countries. Funds shall be made available to support climate actions by Indigenous Peoples in adaptation and mitigation, and based on indigenous traditional knowledge, as well as activities such as land recognition and titling and CBMIS. Parties shall also agree to establish a **dedicated fund mechanism for Indigenous Peoples' participation** in climate policy-making processes. Finance shall be based on **public funds** and be additional to development cooperation aid and conditional on full respect and effective implementation of social, environmental, human and indigenous peoples rights safeguards. As far as the **Green Climate Fund** is concerned, the **Standing Committee on Finance** shall recognize the specific constituency of Indigenous Peoples and their **active observer status, as well ensure direct access to financing.**

United Nations A/RES/69/2

General Assembly

Distr.: General
25 September 2014

Sixty-ninth session
Agenda item 65

**Resolution adopted by the General Assembly on 22 September 2014**
[*without reference to a Main Committee (A/69/L.1)*]

## 69/2. Outcome document of the high-level plenary meeting of the General Assembly known as the World Conference on Indigenous Peoples

*The General Assembly*
*Adopts* the following outcome document:

### Outcome document of the high-level plenary meeting of the General Assembly known as the World Conference on Indigenous Peoples

1. We, the Heads of State and Government, ministers and representatives of Member States, reaffirming our solemn commitment to the purposes and principles of the Charter of the United Nations, in a spirit of cooperation with the indigenous peoples of the world, are assembled at United Nations Headquarters in New York on 22 and 23 September 2014, on the occasion of the high-level plenary meeting of the General Assembly known as the World Conference on Indigenous Peoples, to reiterate the important and continuing role of the United Nations in promoting and protecting the rights of indigenous peoples.

2. We welcome the indigenous peoples' preparatory processes for the World Conference, including the Global Indigenous Preparatory Conference held in Alta, Norway, in June 2013. We take note of the outcome document of the Alta Conference[1] and other contributions made by indigenous peoples. We also welcome the inclusive preparatory process for the high-level plenary meeting, including the comprehensive engagement of the representatives of indigenous peoples.

3. We reaffirm our support for the United Nations Declaration on the Rights of Indigenous Peoples, adopted by the General Assembly on 13 September 2007,[2] and our commitments made in this respect to consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing legislative or administrative measures that may affect them, in accordance with the applicable principles of the Declaration.

4. We reaffirm our solemn commitment to respect, promote and advance and in no way diminish the rights of indigenous peoples and to uphold the principles of the Declaration.

5. In addition to the Declaration, we recall the other major achievements of the past two decades in building an international framework for the advancement of the rights and aspirations of the world's indigenous peoples, including the establishment of the Permanent Forum on Indigenous Issues, the creation of the Expert Mechanism on the Rights of Indigenous Peoples and the establishment of the mandate of the Special Rapporteur on the rights of indigenous peoples. We commit ourselves to giving due consideration to recommendations and advice issued by those bodies in cooperation with indigenous peoples.

6. We encourage those States that have not yet ratified or acceded to the International Labour Organization Indigenous and Tribal Peoples Convention, 1989 (No. 169),[3] to consider doing so. We recall the

1. A/67/994, annex.
2. Resolution 61/295, annex.
3. United Nations, *Treaty Series*, vol. 1650, No. 28383.

obligation of ratifying States under the Convention to develop coordinated and systematic action to protect the rights of indigenous peoples.

7. We commit ourselves to taking, in consultation and cooperation with indigenous peoples, appropriate measures at the national level, including legislative, policy and administrative measures, to achieve the ends of the Declaration and to promote awareness of it among all sectors of society, including members of legislatures, the judiciary and the civil service.

8. We commit ourselves to cooperating with indigenous peoples, through their own representative institutions, to develop and implement national action plans, strategies or other measures, where relevant, to achieve the ends of the Declaration.

9. We commit ourselves to promoting and protecting the rights of indigenous persons with disabilities and to continuing to improve their social and economic conditions, including by developing targeted measures for the aforementioned action plans, strategies or measures, in collaboration with indigenous persons with disabilities. We also commit ourselves to ensuring that national legislative, policy and institutional structures relating to indigenous peoples are inclusive of indigenous persons with disabilities and contribute to the advancement of their rights.

10. We commit ourselves to working with indigenous peoples to disaggregate data, as appropriate, or conduct surveys and to utilizing holistic indicators of indigenous peoples' well-being to address the situation and needs of indigenous peoples and individuals, in particular older persons, women, youth, children and persons with disabilities.

11. We commit our selves to ensuring equal access to high-quality education that recognizes the diversity of the cultures of indigenous peoples and to health, housing, water, sanitation and other economic and social programmes to improve well-being, including through initiatives, policies and the provision of resources. We intend to empower indigenous peoples to deliver such programmes as far as possible.

12. We recognize the importance of indigenous peoples' health practices and their traditional medicine and knowledge.

13. We commit ourselves to ensuring that indigenous individuals have equal access to the highest attainable standard of physical and mental health. We also commit ourselves to intensifying efforts to reduce rates of HIV and AIDS, malaria, tuberculosis and non-communicable diseases by focusing on prevention, including through appropriate programmes, policies and resources for indigenous individuals, and to ensure their access to sexual and reproductive health and reproductive rights in accordance with the Programme of Action of the International Conference on Population and Development[4], the Beijing Platform for Action [5] and the outcome documents of their review conferences.

14. We commit ourselves to promoting the right of every indigenous child, in community with members of his or her group, to enjoy his or her own culture, to profess and practise his or her own religion or to use his or her own language.

15. We support the empowerment and capacity-building of indigenous youth, including their full and effective participation in decision-making processes in matters that affect them. We commit ourselves to developing, in consultation with indigenous peoples, policies, programmes and resources, where relevant, that target the well-being of indigenous youth, in particular in the areas of health, education, employment and the transmission of traditional knowledge, languages and practices, and to taking measures to promote awareness and understanding of their rights.

16. We acknowledge that indigenous peoples' justice institutions can play a positive role in providing access to justice and dispute resolution and contribute to harmonious relationships within indigenous peoples' communities and within society. We commit ourselves to coordinating and conducting dialogue with those institutions, where they exist.

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4. *Report of the International Conference on Population and Development, Cairo, 5-13 September 1994* (United Nations publication, Sales No. E.95.XIII.18), chap. I, resolution 1, annex.
5. *Report of the Fourth World Conference on Women, Beijing, 4-15 September 1995* (United Nations publication, Sales No. E.96.IV.13), chap. I, resolution 1, annex II.

17. We commit ourselves to supporting the empowerment of indigenous women and to formulating and implementing, in collaboration with indigenous peoples, in particular indigenous women and their organizations, policies and programmes designed to promote capacity-building and strengthen their leadership. We support measures that will ensure the full and effective participation of indigenous women in decision-making processes at all levels and in all areas and eliminate barriers to their participation in political, economic, social and cultural life.

18. We commit ourselves to intensifying our efforts, in cooperation with indigenous peoples, to prevent and eliminate all forms of violence and discrimination against indigenous peoples and individuals, in particular women, children, youth, older persons and persons with disabilities, by strengthening legal, policy and institutional frameworks.

19. We invite the Human Rights Council to consider examining the causes and consequences of violence against indigenous women and girls, in consultation with the Special Rapporteur on violence against women, its causes and consequences, the Special Rapporteur on the rights of indigenous peoples and other special procedures mandate holders within their respective mandates. We also invite the Commission on the Status of Women to consider the issue of the empowerment of indigenous women at a future session.

20. We recognize commitments made by States, with regard to the United Nations Declaration on the Rights of Indigenous Peoples, to consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources.

21. We also recognize commitments made by States, with regard to the Declaration, to establish at the national level, in conjunction with the indigenous peoples concerned, fair, independent, impartial, open and transparent processes to acknowledge, advance and adjudicate the rights of indigenous peoples pertaining to lands, territories and resources.

22. We recognize that the traditional knowledge, innovations and practices of indigenous peoples and local communities make an important contribution to the conservation and sustainable use of

biodiversity. We acknowledge the importance of the participation of indigenous peoples, wherever possible, in the benefits of their knowledge, innovations and practices.

23. We intend to work with indigenous peoples to address the impact or potential impact on them of major development projects, including those involving the activities of extractive industries, including with the aim of managing risks appropriately.

24. We recall the responsibility of transnational corporations and other business enterprises to respect all applicable laws and international principles, including the Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework[6] and to operate transparently and in a socially and environmentally responsible manner. In this regard, we commit ourselves to taking further steps, as appropriate, to prevent abuses of the rights of indigenous peoples.

25. We commit ourselves to developing, in conjunction with the indigenous peoples concerned, and where appropriate, policies, programmes and resources to support indigenous peoples' occupations, traditional subsistence activities, economies, livelihoods, food security and nutrition.

26. We recognize the importance of the role that indigenous peoples can play in economic, social and environmental development through traditional sustainable agricultural practices, including traditional seed supply systems, and access to credit and other financial services, markets, secure land tenure, health care, social services, education, training, knowledge and appropriate and affordable technologies, including for irrigation and water harvesting and storage.

27. We affirm and recognize the importance of indigenous peoples' religious and cultural sites and of providing access to and repatriation of their ceremonial objects and human remains in accordance with the ends of the Declaration. We commit ourselves to developing, in conjunction with the indigenous peoples concerned, fair, transparent and effective mechanisms for access to and repatriation of ceremonial objects and human remains at the national and international levels.

6. A/HRC/17/31, annex.

28. We invite the Human Rights Council, taking into account the views of indigenous peoples, to review the mandates of its existing mechanisms, in particular the Expert Mechanism on the Rights of Indigenous Peoples, during the sixty-ninth session of the General Assembly, with a view to modifying and improving the Expert Mechanism so that it can more effectively promote respect for the Declaration, including by better assisting Member States to monitor, evaluate and improve the achievement of the ends of the Declaration.

29. We invite the human rights treaty bodies to consider the Declaration in accordance with their respective mandates. We encourage Member States to include, as appropriate, information on the situation of the rights of indigenous peoples, including measures taken to pursue the objectives of the Declaration, in reports to those bodies and during the universal periodic review process.

30. We welcome the increasingly important role of national and regional human rights institutions in contributing to the achievement of the ends of the Declaration. We encourage the private sector, civil society and academic institutions to take an active role in promoting and protecting the rights of indigenous peoples.

31. We request the Secretary-General, in consultation and cooperation with indigenous peoples, the Inter-Agency Support Group on Indigenous Peoples' Issues and Member States, to begin the development, within existing resources, of a system-wide action plan to ensure a coherent approach to achieving the ends of the Declaration and to report to the General Assembly at its seventieth session, through the Economic and Social Council, on progress made. We invite the Secretary-General to accord, by the end of the seventieth session of the Assembly, an existing senior official of the United Nations system, with access to the highest levels of decision-making within the system, responsibility for coordinating the action plan, raising awareness of the rights of indigenous peoples at the highest possible level and increasing the coherence of the activities of the system in this regard.

32. We invite United Nations agencies, funds and programmes, in addition to resident coordinators, where appropriate, to support the

implementation, upon request, of national action plans, strategies or other measures to achieve the ends of the Declaration, in accordance with national priorities and United Nations Development Assistance Frameworks, where they exist, through better coordination and cooperation.

33. We commit ourselves to considering, at the seventieth session of the General Assembly, ways to enable the participation of indigenous peoples' representatives and institutions in meetings of relevant United Nations bodies on issues affecting them, including any specific proposals made by the Secretary-General in response to the request made in paragraph 40 below.

34. We encourage Governments to recognize the significant contribution of indigenous peoples to the promotion of sustainable development, in order to achieve a just balance among the economic, social and environmental needs of present and future generations, and the need to promote harmony with nature to protect our planet and its ecosystems, known as Mother Earth in a number of countries and regions.

35. We commit ourselves to respecting the contributions of indigenous peoples to ecosystem management and sustainable development, including knowledge acquired through experience in hunting, gathering, fishing, pastoralism and agriculture, as well as their sciences, technologies and cultures.

36. We confirm that indigenous peoples' knowledge and strategies to sustain their environment should be respected and taken into account when we develop national and international approaches to climate change mitigation and adaptation.

37. We note that indigenous peoples have the right to determine and develop priorities and strategies for exercising their right to development. In this regard, we commit ourselves to giving due consideration to all the rights of indigenous peoples in the elaboration of the post-2015 development agenda.

38. We invite Member States and actively encourage the private sector and other institutions to contribute to the United Nations Voluntary Fund for Indigenous Peoples, the Trust Fund on Indigenous Issues,

the Indigenous Peoples Assistance Facility and the United Nations Indigenous Peoples' Partnership as a means of respecting and promoting the rights of indigenous peoples worldwide.

39. We request the Secretary-General to include relevant information on indigenous peoples in his final report on the achievement of the Millennium Development Goals.

40. We request the Secretary-General, in consultation with the Inter-Agency Support Group on Indigenous Peoples' Issues and Member States, taking into account the views expressed by indigenous peoples, to report to the General Assembly at its seventieth session on the implementation of the present outcome document, and to submit at the same session, through the Economic and Social Council, recommendations regarding how to use, modify and improve existing United Nations mechanisms to achieve the ends of the United Nations Declaration on the Rights of Indigenous Peoples, ways to enhance a coherent, system-wide approach to achieving the ends of the Declaration and specific proposals to enable the participation of indigenous peoples' representatives and institutions, building on the report of the Secretary-General on ways and means of promoting participation at the United Nations of indigenous peoples' representatives on the issues affecting them.[7]

*4th plenary meeting*
*22 September 2014*

7. A/HRC/21/24.

## [Rio+20] Indigenous Peoples International Declaration on Self-Determination and Sustainable Development

*June 21 2012*

### Indigenous Peoples International Declaration on Self-Determination and Sustainable Development 19 June, 2012, Rio De Janeiro

Indigenous Peoples from all regions of the world met at the "Indigenous Peoples International Conference on Sustainable Development and Self Determination," from June 17th – 19th 2012 at the Museu da República in Rio de Janeiro, Brazil.

We thank the Indigenous Peoples of Brazil for welcoming us their homelands and express our solidarity for their struggles imposed development such as the Belo Monte Dam which threaten their homelands and ways of life. We also thank indigenous peoples from all regions of the world for their preparatory activities and engagement in this process.

We affirm with one voice that it is time to assume the historical responsibilities to reverse centuries of predation, pollution, colonialism, the violation of rights and genocide. It is time to assume the responsibilities towards our future generations. It is time to choose life.

### 1. Culture as a fundamental dimension of Sustainable Development

As Indigenous Peoples, our fundamental cultural belief systems and world views based on our sacred relationships to each other and Mother Earth have sustained our peoples through time. We recognize the contributions and participation of our traditional knowledge holders, indigenous women and youth.

Cultures are ways of being and living with nature, underpinning our values, moral and ethical choices and our actions. Indigenous peoples' abiding survival is supported by our cultures, providing us with social, material, and spiritual strength. We believe that all societies must foster cultures of sustainability, and that Rio +20 should highlight the cultural, moral and ethical dimensions, as the most fundamental dimension of sustainable development.

**2. Full Exercise of our human and collective rights**

We see that Mother Earth and all life is in a serious state of peril. We see the current model of sustainable development continues to proceed on the road of peril. As indigenous peoples we have experienced the terrible and negative impacts of this approach. These threats extend to peoples in voluntary isolation.

Sustainable development is realized through the full exercise and fulfillment of human rights. Indigenous Peoples see sustainable development and self-determination as complementary. Progress in various countries has happened to the extent that States have fulfilled their duties to respect, protect and promote our human rights, while conflicts have escalated where governments have imposed top-down development, whether labeled "sustainable", "pro-poor" or "green".

The UN Declaration on the Rights of Indigenous Peoples is the standard to be applied in the implementation of sustainable development at all levels, including respect for full participation in decision-making and our Free, Prior, Informed Consent (FPIC) to policies, programmes and projects affecting us.

**3. Strengthening diverse local economies and territorial management**

For Indigenous Peoples, self determination is the basis for Buen Vivir/ living well , and this is realised through secure land rights and territorial management and the the building of vibrant community economies. These local economies provide sustainable local livelihoods, community solidarity and are critical components of resilient ecosystems.

We will continue to strengthen and defend our economies and rights to our lands, territories and resources, against extractive industries, predatory investments, land-grabbing, forced relocation and unsustainable development projects.These include large scale dams, plantations, large-

scale infrastructure, tar sands extraction and other mega-projects, as well as the theft and appropriation of our biodiversity and traditional knowledge.

From the conference emerged many answers to address the global crises, as varied as the many cultures present at the meeting. The greatest wealth is nature's diversity and its associated cultural diversity, both of which are intimately connected and which should be protected in the same way.

Indigenous peoples call upon the world to return to dialogue and harmony with Mother Earth, and to adopt a new paradigm of civilization based on Buen Vivir – Living Well. In the spirit of humanity and our collective survial, dignity and well-being, we respectfully offer our cultural world views as an important foundation to collectively renew our relationships with each other and Mother Earth and to ensure Buen Vivir/ living well proceeds with integrity.

Based on these affirmations and agreements, we commit to carry out the following actions:

**Within and among Indigenous communities, Peoples and Nations**

1) We will define and implement our own priorities for economic, social and cultural development and environmental protection , based on our traditional cultures, knowledge and practices, and the implementation of our inherent right to Self-determination

2) We will revitalize, strengthen and restore our institutions and methods for the transmission of our traditional knowledge and practices focusing on transmission by our women and men elders to the next generations

3) We will restore knowledge and trade exchanges, including seed exchanges, among our communities and Peoples reinforcing the genetic integrity of our biodiversity.

4) We will stand in firm solidarity with each other's struggles to oppose projects that threaten our lands, forests, waters, cultural practices, food sovereignty, traditional livelihoods, ecosystems, rights and ways of life. We also stand in solidarity with others whose rights are being violated, including campesinos, fishers and pastoralists.

## Regarding Actions of States and Corporations

1) We will continue to reject the dominant neo-liberal concept and practice of development based on colonization, commodification, contamination and exploitation of the natural world, and policies and projects based on this model.

2) We insist that States fully implement their commitments under National and International laws and standards which uphold the inherent, inalienable, collective and inter-generational rights of Indigenous Peoples and rights affirmed in Treaties, Agreements and Constructive Arrangements, the UN Declaration on the Rights of Indigenous Peoples and ILO Convention No. 169.

3) We will reject and firmly oppose States policies and programs that negatively impact Indigenous Peoples' lands and territories, ecosystems and livelihoods, or which permit corporations or any other third parties to do so.

## At the United Nations

1) We insist on full and effective participation in all discussions and standard setting activities regarding sustainable development, biodiversity, environment and climate change and for the implementation of the UN Declaration on the Rights of Indigenous Peoples in all these processes.

2) We will carry these messages to the UN Conference on Sustainable Development, the World Conference on Indigenous Peoples (WCIP, 2014) and all other International processes where our rights and survival are affected. We propose that Indigenous Peoples vision and practice of Sustainable Development be a focus of discussion at the WCIP.

We adopt this Declaration on the 19th of June, 2012, in Rio affirming our rights and reiterating our sacred responsibilities to future generations.

*Adopted by networks, organizations, traditional leaders, spiritual leaders and indigenous peoples from the 7 regions of the world, participants of the Conference. Endorsed by Campamento Terra Livre- Cupula dos Povos.*

**Declaration of the Indigenous Peoples of the World to the UNFCCC COP 17**
**International Indigenous Peoples' Forum on Climate Change**
**Durban, South Africa**
**December 2, 2011**

We, the Indigenous Peoples of the world, united in the face of the climate crisis and the lack of political will of the States, especially the biggest emitters of greenhouse gases, demand the immediate adoption of legally binding agreements with shared but differentiated responsibilities, to halt global warming and to define alternative models of development in harmony with Mother Earth.

For decades, Indigenous Peoples have warned that climate change confirms that the harmonic relationship between humans and Mother Earth has been ruptured, endangering the future of humanity in its entirety. The whole model of civilization that began 500 years ago with the pillaging of the natural resources for profit and the accumulation of capital, is in crisis. The alternative is to change the system, not the climate, based on a new paradigm for civilization, Living Well with harmony between the peoples and Mother Earth.

## Our Proposals

*General Framework*

- Recognize and respect the self determination of Indigenous Peoples, in particular our rights to territories and natural resources, in accordance with the United Nations Declaration on the Rights of Indigenous Peoples

- Ensure and guarantee the full and effective participation of Indigenous Peoples at all levels, respecting the processes based on consultation and free, prior and informed consent in accordance with the United Nations Declaration on the Rights of Indigenous Peoples
- Recognize, respect and strengthen the fundamental contribution of the traditional knowledge, innovations and practices of Indigenous Peoples.
- Review the concepts of development based on the accumulation of wealth that emphasizes unlimited exploitation of natural resources.

**Shared Vision**

- We urge developed countries to agree on a framework of legally binding commitments on concrete greenhouse gas emissions (GHG) reduction targets as the follow-up to the Kyoto Protocol that ends in 2012.
- We propose emissions reductions of at least 45% to 1990 levels by 2020 and at least 95% by 2050.
- Gradual elimination of the development of fossil fuels and a moratorium on new fossil fuel exploitation in or near Indigenous Peoples lands and territories, respecting the rights of Indigenous Peoples.
- Shared vision for long-term cooperation must not be limited to defining the increase of temperature and the concentration of GHG in the atmosphere, but rather it must include in an integral and balanced manner a set of financing, technological measures on adaptation, capacity building, patterns of production, consumption and other essential issues like the recognition of the rights of Mother Earth to reestablish our harmony with nature.

**Technology Transfer**

- Knowledge is universal and may not for any reason be subject to private property and use, and neither should its application in the form of technology. Developed countries should share their technology with developing countries.
- Technology transfer and installation should be immediate, timely, free of any costs, in harmony with Mother Earth and free of conditions, whether they are related to already patented technologies or unreleased information.

- Establish guidelines for creating a multilateral and multidisciplinary mechanism for continuous participatory control, management and evaluation of technology exchange. These technologies should be useful, clean and socially appropriate.
- Establish a fund for financing and inventory of appropriate technologies that are free of intellectual property rights, especially patents that should be transferred from private monopolies to the public domain with free access and at low cost

**Adaptation and mitigation**

- Guarantee respect, protection and promotion of indigenous peoples' traditional knowledge and sustainable livelihoods, including the cultural and spiritual aspects.
- Public policies and funds should prioritize full recognition of indigenous peoples' territory. Indigenous Peoples own natural resource use, management and conservation systems should be recognized and promoted.
- The monitoring, reporting and verification system should not be limited to measuring changes in forest coverage, but rather incorporate social variables, specifically those related to the fulfillment of indigenous rights.
- All mitigation and adaptation evaluation, recovery and development actions should incorporate indigenous peoples' knowledge and technologies, subject to their free, prior and informed consent and also guarantee the full participation of indigenous experts.
- We demand that the UN Permanent Forum on Indigenous Issues recommend to the United Nations High Commission that Special Rapporteur on Human Rights and Fundamental Freedoms of Indigenous Peoples prepare a report about the impacts of climate change on indigenous peoples.
- The States should ensure that indigenous peoples have the right of mobility and are not forced to relocate far from their traditional territories and lands and that the rights of peoples in voluntary isolation are respected.
- With regards to climate change migration, adequate programs and

measures shall be in accordance with their rights, statutes, conditions and vulnerabilities.

### Financing

- All financing mechanisms for climate change mitigation and adaptation must be established under the United Nations Framework Convention on Climate Change and directly provide resources to Indigenous Peoples.
- To establish participatory mechanisms to guarantee transparency and accountability in all the funding procedures and operations. The resources should come from public monies and be additional to the funds for development aid.
- To establish a special fund that allows Indigenous Peoples and local communities to develop their own activities and contributions to address climate change.
- Developed countries must commit new annual funding of at least 6% of its gross national product to face climate change in the developing countries.
- Funding must be direct, without conditioning and not violate the sovereignty nor the self determination of Indigenous Peoples.
- The international financial institutions, like the World Bank, must no administer the funds created or to be created because they finance projects that contribute to global warming and especially now that the World Bank pretends to eliminate the safeguards on Indigenous Peoples with the "Program for Results" - P4R
- Developed countries, the principal countries that have caused climate change, must assume their historic and current responsibility and recognize and honor their climate debt fully, which is the basis for a just, effective, scientific solution to climate change.
- In the framework of climate debt, we demand that the developed countries return to the developing countries the atmospheric space that is occupied by their GHG emissions.

### Carbon markets and related mechanisms

The IIPFCC reiterates that the majority of the world's forests are found in Indigenous Peoples' lands and territories. The IIPFCC rejects carbon trading

and forest carbon offsets which commodify, privatize and commercialize forests. We are profoundly concerned that REDD+ jeopardizes the future of humanity by providing polluters with cheap permits to pollute thus further entrenching fossil fuel use, which is the major cause of the climate crisis. REDD++ also threatens the survival of Indigenous Peoples and may result in the biggest land grab of all time. The Cancun Accords failed to provide legally binding safeguards on the rights of Indigenous peoples and REDD+ type projects are already resulting in the violation of Indigenous Peoples' rights. REDD+ promotes industrial plantations and can include the planting of genetically modified trees. Furthermore, the inclusion of soils and agricultural practices in REDD+ and other carbon marketing schemes could commodify almost the entire surface of Mother Earth. Similarly, we also reject using the algae of the oceans for REDD+ projects. Forests are most successfully conserved and managed with indigenous forest governance and recognition, demarcationand titling of Indigenous Peoples' collective land and territories.

*comunicacionforoindigenas@gmail.com*

## FCCC/CP/2010/7/Add.1

## Appendix I

**Guidance and safeguards for policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries**

1. The activities referred to in paragraph 70 of this decision should:

(a) Contribute to the achievement of the objective set out in Article 2 of the Convention;

(b) Contribute to the fulfilment of the commitments set out in Article 4, paragraph 3, of the Convention;

(c) Be country-driven and be considered options available to Parties;

(d) Be consistent with the objective of environmental integrity and take into account the multiple functions of forests and other ecosystems;

(e) Be undertaken in accordance with national development priorities, objectives and circumstances and capabilities and should respect sovereignty;

(f) Be consistent with Parties' national sustainable development needs and goals;

(g) Be implemented in the context of sustainable development and reducing poverty, while responding to climate change;

(h) Be consistent with the adaptation needs of the country;

(i) Be supported by adequate and predictable financial and technology support, including support for capacity-building;

(j) Be results-based;

(k) Promote sustainable management of forests;

2. When undertaking the activities referred to in paragraph 70 of this decision, the following safeguards should be promoted and supported:

(a) That actions complement or are consistent with the objectives of national forest programmes and relevant international conventions and agreements;

(b) Transparent and effective national forest governance structures, taking into account national legislation and sovereignty;

(c) Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples;

(d) The full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities, in the actions referred to in paragraphs 70 and 72 of this decision;

(e) That actions are consistent with the conservation of natural forests and biological diversity, ensuring that the actions referred to in paragraph 70 of this decision are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits;[1]

(f) Actions to address the risks of reversals;

(g) Actions to reduce displacement of emissions.

1. Taking into account the need for sustainable livelihoods of indigenous peoples and local communities and their interdependence on forests in most countries, reflected in the United Nations Declaration on the Rights of Indigenous Peoples, as well as the International Mother Earth Day.

## The Anchorage Declaration
## 24 April 2009

From 20-24 April, 2009, Indigenous representatives from the Arctic, North America, Asia, Pacific, Latin America, Africa, Caribbean and Russia met in Anchorage, Alaska for the Indigenous Peoples' Global Summit on Climate Change. We thank the Ahtna and the Dena'ina Athabascan Peoples in whose lands we gathered.

We express our solidarity as Indigenous Peoples living in areas that are the most vulnerable to the impacts and root causes of climate change. We reaffirm the unbreakable and sacred connection between land, air, water, oceans, forests, sea ice, plants, animals and our human communities as the material and spiritual basis for our existence.

We are deeply alarmed by the accelerating climate devastation brought about by unsustainable development. We are experiencing profound and disproportionate adverse impacts on our cultures, human and environmental health, human rights, well-being, traditional livelihoods, food systems and food sovereignty, local infrastructure, economic viability, and our very survival as Indigenous Peoples.

Mother Earth is no longer in a period of climate change, but in climate crisis. We therefore insist on an immediate end to the destruction and desecration of the elements of life.

Through our knowledge, spirituality, sciences, practices, experiences and relationships with our traditional lands, territories, waters, air, forests,

oceans, sea ice, other natural resources and all life, Indigenous Peoples have a vital role in defending and healing Mother Earth. The future of Indigenous Peoples lies in the wisdom of our elders, the restoration of the sacred position of women, the youth of today and in the generations of tomorrow.

We uphold that the inherent rights of Indigenous Peoples, affirmed by the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), must be fully respected in all decision-making processes and activities related to climate change. This includes our rights to our lands, territories, environment and natural resources as contained in Articles 25-30 of the UNDRIP. When specific programs and projects affect them, the right to Self Determination of Indigenous Peoples must be respected, emphasizing our right to Free Prior and Informed Consent including the right to say "no". United Nations Framework Convention on Climate (UNFCCC) agreements and principles must reflect the spirit of the UNDRIP.

## Calls for Action

1. In order to achieve the fundamental objective of the United Nations Framework Convention on Climate Change (UNFCCC), we call upon the fifteenth meeting of the Conference of the Parties to the UNFCCC to support a binding emissions reduction target for developed countries (Annex 1) of at least 45% below 1990 levels by 2020 and at least 95% by 2050. In recognizing the root causes of climate change, participants call upon states to work towards decreasing dependency on fossil fuels. We further call for a just transition to decentralized renewable energy economies, sources and systems owned and controlled by our local communities to achieve energy security and sovereignty.

In addition, the Summit participants agreed to present two options for action which were each supported by one or more of the participating regional caucuses. These were as follows:

A. We call on the phase out of fossil fuel development and a moratorium on new fossil fuel developments on or near Indigenous lands and territories.

B. We call for a process that works towards the eventual phase out of fossil fuels, without infringing on the right to development of Indigenous nations.

2. We call upon the Parties to the UNFCCC to recognize the importance of our Traditional Knowledge and practices shared by Indigenous Peoples in developing strategies to address climate change. To address climate change we also call on the UNFCCC to recognize the historical and ecological debt of the Annex 1 countries in contributing to greenhouse gas emissions. We call on these countries to pay this historical debt.

3. We call on the Intergovernmental Panel on Climate Change (IPCC), the Millennium Ecosystem Assessment, and other relevant institutions to support Indigenous Peoples in carrying out Indigenous Peoples' climate change assessments.

4. We call upon the UNFCCC's decision-making bodies to establish formal structures and mechanisms for and with the full and effective participation of Indigenous Peoples. Specifically we recommend that the UNFCCC:

a. Organize regular Technical Briefings by Indigenous Peoples on Traditional Knowledge and climate change;

b. Recognize and engage the International Indigenous Peoples' Forum on Climate Change and its regional focal points in an advisory role;

c. Immediately establish an Indigenous focal point in the secretariat of the UNFCCC;

d. Appoint Indigenous Peoples' representatives in UNFCCC funding mechanisms in consultation with Indigenous Peoples;

e. Take the necessary measures to ensure the full and effective participation of Indigenous and local communities in formulating, implementing, and monitoring activities, mitigation, and adaptation relating to impacts of climate change.

5. All initiatives under Reducing Emissions from Deforestation and Degradation (REDD) must secure the recognition and implementation of the rights of Indigenous Peoples, including security of land tenure, recognition of land title according to traditional ways, uses and customary laws and the multiple benefits of forests for climate, ecosystems, and peoples before taking any action.

6. We challenge States to abandon false solutions to climate change

that negatively impact Indigenous Peoples' rights, lands, air, oceans, forests, territories and waters. These include nuclear energy, large-scale dams, geo-engineering techniques, "clean coal", agro-fuels, plantations, and market based mechanisms such as carbon trading, the Clean Development Mechanism, and forest offsets. The rights of Indigenous Peoples to protect our forests and forest livelihoods must be ensured.

7. We call for adequate and direct funding in developed and developing States and for a fund to be created to enable Indigenous Peoples' full and effective participation in all climate processes, including adaptation, mitigation, monitoring and transfer of appropriate technologies in order to foster our empowerment, capacity-building, and education. We strongly urge relevant United Nations bodies to facilitate and fund the participation, education, and capacity building of Indigenous youth and women to ensure engagement in all international and national processes related to climate change.

8. We call on financial institutions to provide risk insurance for Indigenous Peoples to allow them to recover from extreme weather events.

9. We call upon all United Nations agencies to address climate change impacts in their strategies and action plans, in particular their impacts on Indigenous Peoples, including the World Health Organization (WHO), United Nations Educational, Scientific and Cultural Organization (UNESCO) and United Nations Permanent Forum on Indigenous Issues (UNPFII). In particular, we call upon all the United Nations Food and Agriculture Organization (FAO) and other relevant United Nations bodies to establish an Indigenous Peoples' working group to address the impacts of climate change on food security and food sovereignty for Indigenous Peoples.

10. We call on United Nations Environment Programme (UNEP) to conduct a fast track assessment of short-term drivers of climate change, specifically black carbon, with a view to initiating negotiation of an international agreement to reduce emission of black carbon.

11. We call on States to recognize and implement the fundamental human rights and status of Indigenous Peoples, including the collective rights to traditional ownership, use, access, occupancy

and title to traditional lands, air, forests, waters, oceans, sea ice and sacred sites as well as the rights affirmed in Treaties are upheld and recognized in land use planning and climate change mitigation strategies. In particular, States must ensure that Indigenous Peoples have the right to mobility and are not forcibly removed or settled away from their traditional lands and territories, and that the rights of peoples in voluntary isolation are upheld. In the case of climate change migrants, appropriate programs and measures must address their rights and vulnerabilities.

12. We call upon states to return and restore lands, territories, waters, forests, oceans, sea ice and sacred sites that have been taken from Indigenous Peoples, limiting our access to our traditional ways of living, thereby causing us to misuse and expose our lands to activities and conditions that contribute to climate change.

13. In order to provide the resources necessary for our collective survival in response to the climate crisis, we declare our communities, waters, air, forests, oceans, sea ice, traditional lands and territories to be "Food Sovereignty Areas," defined and directed by Indigenous Peoples according to customary laws, free from extractive industries, deforestation and chemical-based industrial food production systems (i.e. contaminants, agro-fuels, genetically modified organisms).

14. We encourage our communities to exchange information while ensuring the protection and respect of intellectual property rights at the local, national and international levels pertaining to our Traditional Knowledge, innovations, and practices. These include knowledge and use of land, water and sea ice, traditional agriculture, forest management, ancestral seeds, pastoralism, food plants, animals and medicines and are essential in developing climate change adaptation and mitigation strategies, restoring our food sovereignty and food independence, and strengthening our Indigenous families and nations.

We offer to share with humanity our Traditional Knowledge, innovations, and practices relevant to climate change, provided our fundamental rights as intergenerational guardians of this knowledge are fully recognized and respected. We reiterate the urgent need for collective action.

Agreed by consensus of the participants in the Indigenous Peoples' Global Summit on Climate Change, Anchorage Alaska, April 24th 2009

## ABOUT THE EDITORS AND CONTRIBUTORS

**Krishna B. Bhattachan** is a sociologist. He holds a PhD degree in Sociology from the University of California at Berkeley (USA). He is one of the founding faculty members and former Head of the Central Department of Sociology and Anthropology at Tribhuvan University and founder General Secretary of the Sociological/Anthropological Society of Nepal (SASON). His research works, publications and advocacy are on indigenous peoples, Dalits, gender issues, and developmental practices in Nepal.

**Pasang Sherpa** is a senior lecturer of Sociology at the Department of Sociology, Trichandra Multiple Campus, Tribhuvan University, Kathmandu, Nepal. Sherpa has obtained a PhD in Sociology from University of Kashmir. Sherpa has carried out academic and applied research in different areas of Nepal. He has published two books on the "Ethnographic Profile of Sherpas" and "The Sherpas". He has published several articles and research reports on the issues of climate change, indigenous peoples, customary law and practices, minority education, and social exclusion and inclusion in Nepal.

**Pasang Dolma Sherpa** is a PhD scholar in Environmental Education at Kathmandu University, Kathmandu. She serves the Nepal Federation of Indigenous Nationalities (NEFIN) as the National Coordinator of the Climate Change Global Partnership Program in Nepal since June 2009. Sherpa has been working in the field of environmental education and development including the social entrepreneurs and community radio since 2004. Sherpa has already contributed more than 20 articles in both national and international magazines, journals and books as an author

since 2005. Ms. Sherpa has served as a member to the Policy Board of UN-REDD for two terms and now she has been serving on the Participant Committee of Forest Carbon Partnership Facilities (FCPF) World Bank on behalf of Indigenous Peoples of Asia and Pacific since 2013. She has been closely following the negotiations of United National Framework Convention on Climate Change (UNFCCC) as a member of International Indigenous Peoples Forum on Climate Change (IIPFCC) since 2009. Currently, she is pursuing her PhD in Development education from Kathmandu Universty, Nepal.

**Naya Sharma Paudel** is a senior researcher at Forest Action Nepal, a Kathmandu based forestry research institution. He has a PhD in political ecology from the University of Reading (UK), and has been working in Nepal and in the region for over two decades. He has gained rich insights of research and development experiences on forest policy and tenure, environmental governance, and rural livelihoods. In recent years, he has become increasingly involved in studying the political economy of climate change, REDD+ and forest governance. His current research is focused on poverty, community rights, institutional dynamics, natural resource related conflicts and benefit sharing especially in the context of REDD+.

**Dil Raj Khanal** is a natural resource and common property lawyer working for promotion and protection of community property rights of community-based natural resource management groups in Nepal for the past 18 years. He is also working as a policy facilitator for safeguards system in climate change including REDD+ in Nepal. Currently he is affiliated with national level federations/associations related to community-based NRM groups.

**Tunga Bhadra Rai** completed a master's degree in Anthropology from Tribhuvan University, Nepal and went to Cornell via the Nepal Study Abroad Program, a joint cross-cultural academic learning course between Cornell University (USA) and Tribhuwan University (Nepal), for two semesters. Mr. Rai was awarded the Harka Gurung Research Fellowship (2009-2011) by Social Inclusion Research Fund (SIRF), Netherlands Development Organization (SNV) Nepal. He has worked with a number of organizations and has engaged in research resulting in several published research articles. He is currently working with Nepal Federation of Indigenous Nationalities (NEFIN) based in Nepal.

**Ugan Manandhar** is the Deputy Director at WWF Nepal and heads the Climate Change, Energy and Fresh Water Program. His academic background is in electrical engineering combined with a business degree. For the past nine years, he has been working in the environment sector on the climate change policy, climate change adaptation, mitigation, low carbon development, renewable energy promotion, integrated river basin management, and smart infrastructure. He is a member of the core negotiating team for the UNFCCC, a member of the technical committee for REDD+, and CDM for the GoN. He has the practical experience to link both policy and practice relating to issues dealing with climate change.

He was selected by the US Government to participate in its leadership program on Climate change and Energy and was recently nominated as a mentor for youth interested in the environment sector by the US Embassy. He is a visiting faculty at Tribhuvan University on climate policy and issues related to climate change lime adaptation and mitigation. With nine years of experience in the environment sector, Mr. Manandhar is a recognized leader in his field and has participated in various national and international forums on climate change, REDD carbon financing, and adaptation representing WWF and Nepal.

**Ruedi Baumgartner** came into contact with Nepal in the 1970s when he did his PhD on the impacts of expedition and trekking tourism on the Sherpas of Rolwaling. After various long-term assignments in development cooperation, he acted as co-director at the Centre for Development and Cooperation (nadel) at the Swiss Federal Institute of Technology Zurich (ETH). He has lectured in the Master of Advanced Studies in Development and Cooperation (MAS) program, runs an active consulting business, and engages in applied development research, mainly with a focus on rural livelihood systems. His contribution is based on a chapter of a forthcoming publication at Vajra Publishers, “Farewell to Yak and Yeti? - The Rolwaling Sherpas facing a globalized world."

**Roshani Dangi** is currently a PhD candidate in Environmental Science and Policy at George Mason University. She completed her master’s degree in Environmental Studies at Ohio University, and also holds a master’s degree from Pokhara University. Her past research investigated the effects of social, economic, and other factors contributing to the forestry sector of Nepal, and cost benefit analysis of community forestry in Nepal. Her current research focuses on ascertaining the correlation

between forest-carbon and biodiversity conservation under REDD+ strategy. Her interest includes climate change, forestry, biodiversity conservation, environmental economics, and GIS.

**Resham Bahadur Dangi** is currently working in the Ministry of Forests and Soil Conservation in the capacity of Joint Secretary. He has worked for the Government of Nepal for the last 28 years in various capacities. Currently, he is head of the Forest Enterprise and Management Division in the Ministry. He is also head of the REDD Implementation Center under the same Ministry. He holds a master's of science degree in Forest Economics and Policy from Virginia Polytechnic and State University. His area of interest includes Common Property Resource Economics, Environmental Economics, Forest Policy, and REDD+.

**Prem Sagar Chapagain** is Associate Professor at the Central Department of Geography, Tribhuvan University since 1997. His primary research interest is on nature-society interaction and resulting changes in the Himalayas. Other research areas include resource management, mountain farming systems, and climate change adaptation in the context of global change. He has worked as team leader and researcher on many international collaborative research projects such as improving resilience and adaptive capacity to climate change in the HKH region with Australian National University and the Chinese Academy of Science; climate change assessment and integrated watershed management with UNDP Nepal; energy types and consumption patterns in tourist destinations in Himalayas with University Grants Commission, Nepal; climate change and farming flexibility in the Himalayas with University of Bergen, Norway; local effects of large scale global processes in the Himalayas, NUFU, Norway; and anthropogenic activities and climate change vulnerability with WWF, Nepal. He also contributed as team leader of the Social Inclusion Atlas by the Central Department of Sociology/Anthropology TU with SIRF/SNV. He has supervised more than 20 MA thesis in Geography and Biodiversity and Environmental Studies. He has published about 20 research articles, five books, and five atlases of Nepal. He has participated in many international and national conferences.

**Pawan Kumar Ghimire** is a Geographer cum GIS Expert. He has 20 years of experience in the application of Geographic Information System and RemoZate Sensing (GIS/RS) in various fields. He has applied GIS/RS as an analytical tool in many research works and projects relating

to climate change, natural resource management, conservation, hydro-dynamic modelling, watershed management, disaster risk management, health service, socio-economic, and infrastructure planning. Recently, he was involved in the Social Inclusion Atlas and Ethnographic Profile mapping of Nepal as GIS Expert for Social Inclusion Research Fund, SNV Nepal. He was also involved in Glacial Lake Outburst Flood Modelling of several glacial lakes in Nepal and China for ICIMOD, showing the flooding scenarios and downstream impacts. Finally, he was also involved in climate change vulnerability mapping of Nepal for the NAPA document. He has published a number of journal articles and books, both nationally and internationally. Currently, he is serving as Executive Director of a research consulting firm Geographic Information Systems & Integrated Development Center (GISIDC).

**Deepak KC** holds a Master's Degree in Environmental Science (M.Sc), focusing on integrated watershed management in the context of climate change. He graduated from The University of Tokyo and is a recipient of the Asian Development Bank Award (ADB-JSP) for 2005 - 2007. He has more than 10 years of professional working experience in programme design, planning, and implementation in the areas of climate change, environment conservations/management, multi-hazards risks assessment, particularly climate risk management (CRM), and integrated watershed management in various districts covering all three ecological regions of Nepal through the UN agency-UNDP, INGO, NGOs and academic institutions. Currently, Mr. KC is leading the Integrated Climate Risk Management Programme team of Nepal under the Comprehensive Disaster Risk Management Programme (CDRMP), in UNDP Nepal. Prior to this position, he undertook the responsibility of Project Officer for Climate Risk Management and Community Based Disaster Risk Management in UNDP. Mr. KC has presented a number of papers at both national and international workshops and seminars and has training on themes such as climate change, DRR, environment conservations/management, and multi-hazards risks assessment.

**Yasso Kanti Bhattachan** (Gauchan) is one of the founding members of the National Indigenous Women's Federation and has been involved in several other organizations advocating for the rights of indigenous people and particularly of indigenous women. She is one of the leading indigenous women activists and scholars of Nepal.