

# A reflection on the role of community forest user groups to enable vulnerable communities to adapt to climate change in Nepal

Popular Gentle<sup>1</sup>, Rik Thwaites<sup>2</sup>, Digby Race<sup>3</sup>, Kim Alexander<sup>4</sup>

## ABSTRACT

In Nepal, community forest user groups (CFUGs) as local institutions have demonstrated appropriate institutional arrangements to manage forest resources as commons. The characteristics, functions and roles of CFUGs required to manage commons are well studied and have been translated into practice. Less is known about the role of CFUGs, as local institutions, in managing local adaptation to climate change and climate variability, particularly the key characteristics and functions required to support vulnerable communities. Case study research on the issues of development of adaptation strategies by CFUGs and villagers of differing well-being groups in the mountains of Nepal is reported through qualitative and quantitative research methods.

This research examines the role and potential of CFUGs as key local institution to enable vulnerable communities, individually or as a collective to promote actions for climate change adaptation in the rural hills of Nepal. Of interest are the mandates, roles, functions and capacity of CFUGs required to facilitate climate change adaptation to assist the most vulnerable communities. The research identifies that improved governance, enhanced capacity, knowledge and skills in mediating external services, and support mechanisms in knowledge and information are key factors to optimize the role of CFUGs in adaptation to climate change. More importantly, the research suggests that the success of CFUGs to assist the most vulnerable in communities depends largely on institutional ability to transform organizational policies, structure and practices, and delegate authority and power. These actions are pathways to build trust, empower, engage and allow the most vulnerable populations to use their rights to an equitable share of the productivity of the commons.

**Key words:** *Local institutions, community forest user groups, collective actions, common, climate change, adaptation, vulnerable, Nepal*

## 1. INTRODUCTION

The role of local institutions in managing common pool resources has been a topic of research interest since the 1980s (Berkes 1989; Ostrom 1990, 2010). Studies on the use and distribution of resources of the commons indicate that local resource users develop institutional arrangements to collectively manage resources such as forests, fisheries, grazing lands and water systems and share benefits derived from resource management (Agrawal et al. 2013; Agrawal and Yadama 1997; Baland and Platteau 1996; Kellert et al. 2000; Ostrom 1992; Pretty and Ward 2001). Studies

---

<sup>1,2,3,4</sup> Institute for Land, Water and Society, Charles Sturt University, NSW, 2640. Australia. <sup>3</sup> The Fenner School of Environment and Society, The Australian National University, Canberra, ACT, 0200, Australia. Contact: pgentle@csu.edu.au

have also revealed that ineffective institutional arrangements can result in under or over exploitation of common pool resources (Clark 1973; Larson and Bromley 1990). Ostrom (2005) has shown that resource dependent communities often develop institutional rules to define their resource boundaries, user rights, resource allocation rules, monitoring arrangements, and conflict resolution mechanisms to regulate and manage common pool resources.

Resource dependent communities are historically experienced in managing weather-dependent natural resources and have developed various adaptation practices to reduce their risks and vulnerabilities (Adger 2003; Agrawal 2001; Alexander et al. 2010). However, coping and adaptation strategies applied by local communities may not be adequate due to lack of information, knowledge and resources in the face of increasing climate change induced vulnerabilities of livelihoods of resource dependent communities. Climate change has implications for natural resource based livelihoods and the projected risks are more profound where livelihoods of communities are primarily dependent on weather sensitive natural resources (IISD 2003; Paavola and Adger 2002; Smit et al. 2007). The roles of local institutions thus become more important in responding to the impacts of climate change and in supporting local communities to enhance their adaptive capacity at individual, household and community levels (Agrawal 2010; Ostrom 2010). According to Adger (2003), adaptation is a dynamic social process and the ability of societies to adapt is determined, in part, by the ability to act collectively. Adger (1999) differentiates individual and collective vulnerabilities with their causes and indicators, listing the causes of individual vulnerability as relative and absolute poverty, entitlement failure and resource dependency; and of collective vulnerability as infrastructure development, institutional and political factors, insurance and formal and informal social security.

The role of local institutions has been considered very important in climate change adaptation as local institutions can influence the distribution of climate risk by organizing incentives for household and community level adaptations, and by mediating external interventions suited to the local context (Agrawal 2010). Local institutions contribute to communities' ability to cope with the risks of climate change by facilitating and managing the interactions between social and natural capital (Adger et al. 2003; Pretty and Ward 2001). There are many examples of rural communities that have acted to enhance their adaptive capacity and organized collectively to manage climate risks using local institutions in the form of social networks, capital, norms and traditions (Adger 2003; Pelling and High 2005; Rodima-Taylor et al. 2011). Adger (2003) has shown that collective actions such as the formation and functioning of social networks are linked with adaptive capacity as collective actions can mediate collective risks in the face of climate change.

The role of local institutions in Nepal has been well recognized in the literature because of their active role in managing the country's most important natural resources such as forests and water as common pool resources (Adhikari and Di Falco 2009; Lim et al. 2005; Ostrom 1990). Local institutions such as CFUGs and irrigation groups have been recognized for their potential roles in the implementation of adaptation plans at the local level (MoE 2010; Pokharel and Byrne 2009). One of the most widespread and well-established local institutions in rural Nepal are CFUGs. There are currently over 17,500 CFUGs as local institutions managing approximately

1.65 million ha of community forests (out of total 5.8 million ha) mobilizing 2.1 million households (about 40% of total and over 60% of rural population) in Nepal (DoF 2011). The CFUGs have a progressive mandate and would appear to have the potential to contribute to climate change adaptation by providing ecological goods and services, socio-economic benefits and a 'safety net' for poor people (Pokharel and Byrne 2009).

The role, capacity and functions of CFUGs in Nepal that would enable vulnerable communities to adapt to climate change are not fully understood. There are also limitations and concerns about the role and commitment of these institutions in addressing contemporary issues related to governance (such as equity, transparency, inclusion and participation), gender and poverty (Gentle et al. 2007; Kanel 2008; Nightingale 2002; Paudel et al. 2010; Thoms 2008). Rural poor who depend on natural resources are considered the most vulnerable to climate change impacts (Agrawal and Perrin 2008; IPCC 2007; Paavola and Adger 2006). Thus there is a strong need and justification to support poor and vulnerable communities to improve livelihoods and enhance their adaptive capacity (Gentle and Maraseni 2012; Moser 2010; Vernon 2008). However, it is questionable whether the CFUGs, often dominated and controlled by local elites (e.g. well-off, upper caste, men), are prepared to support poor and vulnerable communities in providing measures to adapt to climate change.

Based on these understandings of the roles and capacities, the research reflects on the roles, functions and characteristics of CFUGs in the context of climate change adaptation. Moreover, the research considers changes to CFUGs that may enhance their effectiveness in supporting the most vulnerable communities for climate change adaptation. The following sections present a theoretical background of institutions and their role in the context of climate change, a description of the research site and methodology applied, key results, discussion and conclusions.

## **2. INSTITUTIONS AND THEIR ROLE IN THE CONTEXT OF CLIMATE CHANGE ADAPTATION**

### **2.1 Institutions and institutional theories**

Discussion of 'institutions' emerged in the social and political sphere in the eighties mostly to define and explain formal institutions. North (1994, 360) defined institutions as "*humanly devised constraints that structure human interaction. They are made up of formal constraints (e.g., rules, laws, constitutions), informal constraints (e.g., norms of behaviour, conventions, self-imposed codes of conduct), and their enforcement characteristics. Together they define the incentive structure of societies and specifically economies*". Similarly, Bromley (1989, 22) defined institutions as "*rules and conventions of society that facilitate coordination among people regarding their behaviour*". Institutions can be formal or informal and exist at multiple scales of human organization. Collective management of environmental goods and services as common pool resources requires institutions in the form of rules, structures, norms and values (Ostrom 1990; Vatn 2009).

The term "institution" covers a broad range of social structures including public, civic and private sector and at different scales such as local and national (Agrawal and

Perrin 2008; Uphoff et al. 2006). Public institutions include government agencies with legal authority that can impose penalties or sanctions backed by governmental powers of enforcement. Civic institutions are membership based cooperatives or volunteer organizations whose actions are to serve the common interest of their members in areas such as pooling and mobilizing products, access to capital, labour needs and other factors of production. Private institutions can include both profit and non-profit based organizations such as charities, trusts, foundations and market organizations.

## **2.2 Local institutions and collective actions**

Scott and Marshall (2009) define collective action as an “*action taken by a group (either directly or on its behalf through an organization) in pursuit of members’ perceived shared interests*”. Collective actions are volunteer actions such as collective decision-making, setting rules to conduct and manage a group, implementing decisions, and monitoring adherence to rules (Meinzen-Dick et al. 2004). According to Poteete and Ostrom (2004) collective actions emerge and grow in the forms of formation and development of institutions, mobilization of resources, co-ordinate activities and information sharing.

Collective actions occur through involvement of a group of people with a shared interest and generally involve common action driven by shared interest (Meinzen-Dick and Di Gregorio 2004). Collective action enhances coordination, organization, and mobilization of individuals and groups to achieve a common goal and produce collective and effective outcomes (Ostrom 1990). Collective actions also occur in instances of state and market failures, particularly in meeting the needs of the poor in agricultural and rural development (Meinzen-Dick et al. 2004). In Nepal, evidence of collective actions is observed through various group activities and programs such as forest user groups, microfinance groups, watershed management programs, integrated pest management, participatory breeding and farmer-managed irrigation systems.

## **2.3 Effectiveness of local institutions in managing commons**

Environmental and resource regimes provide examples of common institutions that can regulate actions against environmental degradation either through restriction on over-exploitation of resources or reducing unintended side effects of resource exploitation (Young 2010). The characteristics, functions and roles of common pool resource management institutions related to irrigation, forestry, fisheries and pastures have been widely studied. The concepts and practices of self organization amongst resource users under particular institutional arrangements have been well established (Cox et al. 2010; Feeny et al. 1990). Most of the studies, innovations and criticisms are based on theories and principles such as:

- i) institutional rules (Ostrom 1986, 1990);
- ii) underlying factors for effectiveness of collective action (Wade 1988);
- iii) design principles for long-enduring and robust institution (Ostrom 1990); and
- iv) facilitating conditions for collective action (Baland and Platteau 1996).

The effectiveness of local institutions has been examined in common pool management systems. Andersson and Agrawal (2011), examining the relationship between socio-economic inequalities and ecological sustainability related to forest commons, found that socio-economic inequalities had negative effects in forest outcomes; however, such inequalities were found to be significantly reduced where local institutions were effectively functioning with collective actions. Lam (1998), in a comparative study of farmer and government-managed irrigation systems in Nepal, concluded that farmer-managed irrigation systems were performing better than the government-managed irrigation systems in terms of better ownership, well established and accepted local rules, and equity in benefit sharing. These examples well demonstrate the effectiveness of local commons in managing local resources.

## **2.4 Capacity of local institutions in managing climate change adaptation**

According to Agrawal and Perrin (2008) climate change adaptation is a local process, and its effectiveness depends on local and external institutions through which incentives for individual and collective actions are defined. This is because *“institutional arrangements structure risks and sensitivity to climate hazards, facilitate or impede individual and collective responses, and shape the outcomes of such responses”* (Agrawal and Perrin 2008, 8). Institutions play important roles in influencing livelihoods and adaptations of rural communities in three different ways as: (i) institutions structure the distribution of climate risks and impacts; (ii) institutions constitute and organize the incentive structures for household and community level adaptations for their adaptation responses; and (iii) institutions mediate external interventions into local contexts which ultimately unfold the adaptation by articulating social and political process (Agrawal and Perrin 2008).

There are many examples where rural communities have enhanced adaptive capacity and collectively organized to manage climate risks using their local institutions in the form of social networks, capital, norms and traditions (Pelling and High 2005; Rodima-Taylor et al. 2011). The formation and functioning of social networks are linked with adaptive capacity of the socio-ecological system because collective actions can mediate collective risks and enhance adaptive capacity to climate change (Adger 2003). Studies by Adger (2000) and Agrawal (2008) have highlighted the potential for rural institutions to strengthen the adaptive capacity and facilitate adaptation to climate change at the local level. Based on studies conducted in Mexico, Eakin (2005) argues farmers' sensitivity to climatic impacts and their capacity to manage climatic risk mainly depends on how they organize their livelihoods in confronting institutional change. Robledo et al., (2004) have shown how community organizations in hill communities in Bolivia remained successful in developing adaptation strategies and building resilience through ecosystem management and restoration activities including rehabilitation of watersheds, agro-ecology, and forest landscape. Moser (1996) and Narayan-Parker (1997) have argued that communities associated with social networks and civic associations are more likely to cope successfully with adverse situations caused by climate change.

## 2.5 Limitations of CFUGs in managing common pool resources

The inclusion and participation of marginalized community members such as poor, women and *Dalits*<sup>2</sup> and their access to equitable benefit sharing from common pool resource management in Nepal is questioned and criticized by several authors (Acharya and Gentle 2005; Adhikari and Di Falco 2009; Hughes 1993; Kanel 2008; Tiwary 2006). The patriarchal social structure and historically constructed power relations were found to be a major cause for exclusion of women in collective actions in South Asia (Agarwal 2010). Adhikari and Di Falco (2009) explored the role of social heterogeneity in the participation of households in decision making positions in community forestry (CF) in Nepal, finding that, members of households belonging to lower-caste groups had a lower probability of being elected as members of the executive committee of user groups. Poverty and powerlessness in Nepal historically depends on caste, gender, ethnicity and geographical location of people (Bennett et al. 2006; CBS 2011). The issues related to inequality and discrimination, non-participation, disempowerment, and lack of accountability are also considered to diminish core human rights (Evans 2009).

The disparity in socio-economic outcomes of community forestry has been analyzed in a study of 1,788 CFUGs from 12 middle hill and Terai districts of Nepal (Kanel 2004). The study found that the total annual income of CFUGs in Nepal in 2004 was about 10 million USD, however, only about 3% of this went to specifically pro-poor investments, in comparisons to expenditures in other areas such as community development (36%), forest development (28%), miscellaneous (17%) and CFUG operational expenses (14%). Another study of eight CFUGs in Nepal revealed that the economic activities or commercialization of community forestry was not pro-poor with unequal distribution of the funds among community households (Paudel et al. 2010). Studies by Paudel et al., (2006) and Paudel et al., (2010) also confirmed that association between CFUG members, contractors and forestry officials promoted and institutionalized corruption in the CFUGs following commercialization of forest products. Corruption is common in Nepal as the country has been ranked at 139<sup>th</sup> position in the Transparency International global corruption index (TI, 2012). Realizing these socio-economic disparities and equity issues, the community forestry guideline was revised in 2009 (GoN 2009) including provisions for participation, decision making and benefit sharing to assist pro-poor affirmative actions.

## 3. RESEARCH LOCATION AND METHODOLOGY

### 3.1 Research location

Case study research was conducted in the Lamjung district of Nepal. The district is located in the middle hills region of western Nepal. The population of the district in 2011 was 169,104 in 44,068 households (GoN 2012). The district is representative of the middle hill region of Nepal where over two thirds of the population of the district depends on subsistence agriculture with a strong linkage between farming, pasture lands and forestry. The district is ranked as one of the very high climate change vulnerable districts in Nepal based on high vulnerabilities due to landslides

---

<sup>2</sup> Dalits are occupational caste groups considered as untouchables and so called low caste group in South Asia.

and glacial lake outburst floods (GLOF) (MoE 2010). The population of the district is diverse in terms of caste (including *Dalit* and other castes), culture and indigenous ethnic identity (such as *Gurung*, *Magar*, and *Tamang*). Table 1 presents a description of CFUGs selected for case study.

**Table 1 Description of CFUGs selected for research**

| Name of the CFUG        | Major caste and ethnicity      | Location Village (VDC) | Altitude (meter) | Number of households | Area of CF (ha) | Year CF handed over |
|-------------------------|--------------------------------|------------------------|------------------|----------------------|-----------------|---------------------|
| Kataharbari             | Bahun, Chhetri, Dalits         | Tarkughat (downstream) | < 500            | 80                   | 22.40           | 1995                |
| Raniswanra Sankharpakha | Bahun, Chhetri, Dalits         | Archalbot (downstream) | < 500            | 130                  | 54.17           | 1996                |
| Chisapani               | Bahun, Chhetri, Gurung, Dalits | Bahundanda (upstream)  | > 1,000          | 60                   | 34.81           | 2005                |
| Manasalu                | Gurung, Dalits                 | Ghermu (upstream)      | > 1,000          | 120                  | 97.80           | 2003                |

Source: DFO and CFUG records

The forests in this district complement agricultural practices by providing forest products, grazing land, environmental services to stabilize land, and to regulate water resources (DFO 2012). Approximately 39% of the total area of the district is covered by forests (total area = 170,781.6 ha) and about 19,319 ha forest area of the district has been handed over to 24,904 households affiliated with 304 CFUGs as a community forest (DFO 2012). The remainder of the forests in the district is either managed by the government or by the Annapurna Conservation Area Project. The research was conducted in four village development committees (VDCs) of the district, two from downstream (altitude below 500 m) and two from upstream region with altitude above 1000 m along the Marsyangdi River. Four CFUGs were selected as research sites representing one each from selected VDCs.

### 3.2 Research methods

The research followed a mixed method approach based on pragmatism using an interpretivist perspective (Johnson et al. 2007; Tashakkori and Teddlie 2003). The inductive theory followed by a deductive theory was combined considering qualitative methods as dominant and quantitative methods as complementary methods of data collection (Creswell 1994; McMurray et al. 2004). Qualitative methods provided the primary data collection techniques, including in-depth interviews (n=62 community and district level interviewees), focus group discussions (FGDs) (n=11 events and 117 participants from community level) and participant observations. Complementary quantitative data was gathered through a household level survey (n=133 community level respondents). Participatory well-being ranking was conducted in all research sites to categorize the research population into four well-being strata (well-off, medium, poor and very poor) based on relative well-being position of households in the community using local criteria of well-being (Mosse 1994). Survey respondents and interviewees were selected representing all well-being groups using stratified

random sampling process. Quantitative data was analyzed using SPSS 17 and the qualitative data was analyzed through a thematic hierarchical approach using NVIVO 9.

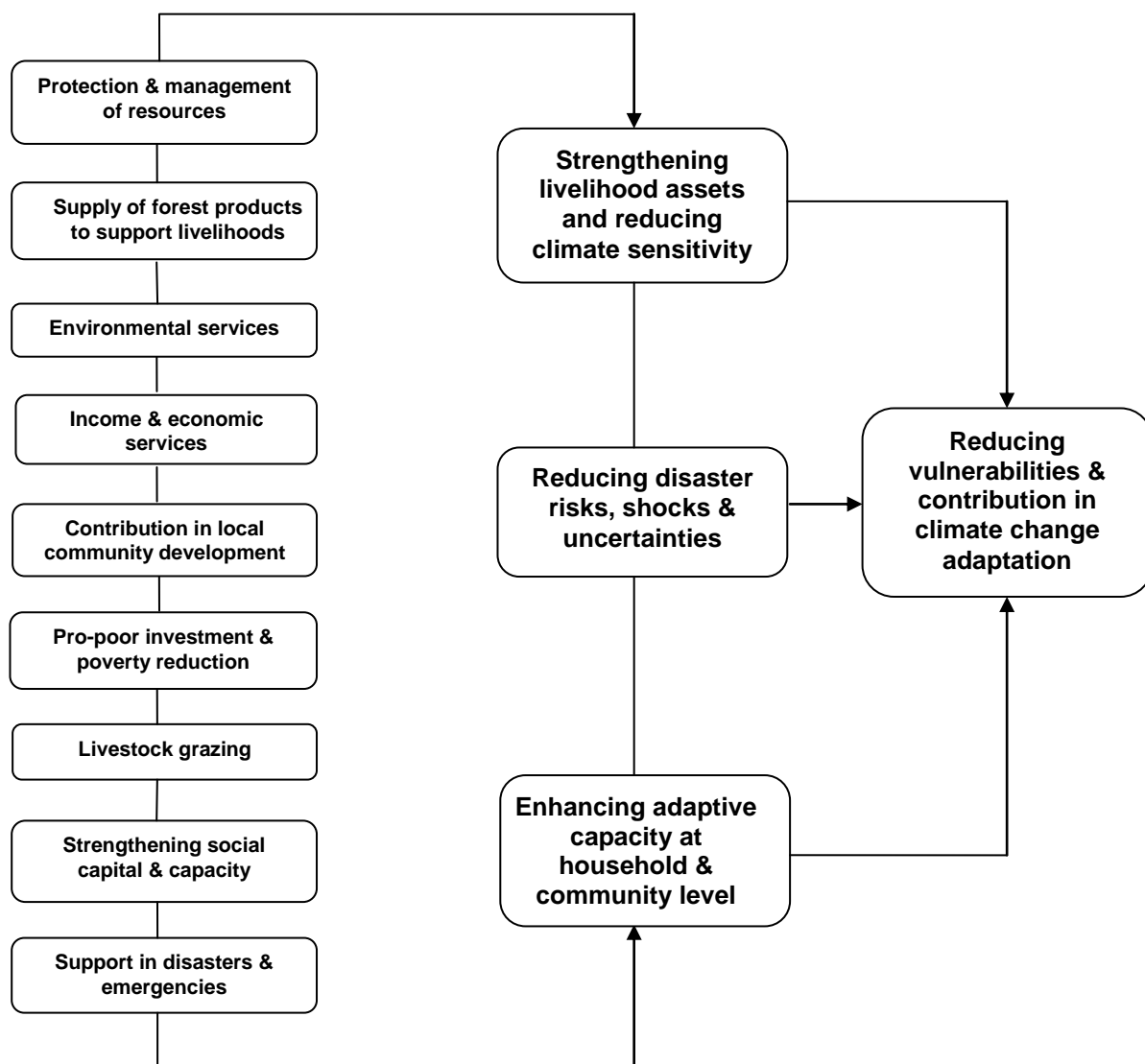
## **4. RESULTS**

### **4.1 CFUGs and their contribution in climate change adaptation**

The research participants (interviewees, household survey respondents and participants of FGDs) recognized the current role and potential of CFUGs in climate change adaptation. The CFUGs function in coordination with various formal and informal local institutions, within the state, civil society and private sectors. Although, the plans and activities of the CFUGs had no explicit provisions for climate change adaptation, research participants recognized the useful contribution in enabling communities in climate change adaptation. The existing knowledge, capacity and experience of all CFUGs was very low in designing and implementing climate change related activities and in addressing the needs of local community for climate change adaptation initiatives. The role and mandate of CFUGs was not explicitly identified in written policies, however these institutions were willing to enhance their understanding of climate change and implement adaptation activities to reduce vulnerability.

Almost all research participants in the communities had an association with CFUGs. The CFUGs had well established networks with locally governed rules, norms and values to mobilize local communities and manage common pool resources. The major roles and functions of the CFUGs to support local communities in climate change adaptation were highlighted as: (i) income and employment generation; (ii) protecting and managing forest commons; (iii) supply of forest products and contribution in rural livelihoods; (iv) environmental services such as protection and conservation of soil and water resources; (v) income and economic services; (vi) contribution in infrastructure development and community development activities; (vii) pro-poor investment and contribution in poverty reduction; (viii) livestock grazing (ix) awareness raising, capacity building and leveraging social capital, and (x) supporting communities in disaster risk reduction and emergency relief (Figure 1).





**Figure 1 Ongoing contribution of CFUGs in climate change adaptation and rural livelihoods** (Source: Interview and FGD transcriptions)

## 4.2 Outreach of CFUGs to vulnerable communities

Participants recognized the important role of CFUGs as local institutions in mobilizing large number of community members and managing common pool resources according to locally governed rules. Analysis was carried out of their role, capacity and willingness to support the most vulnerable communities, exploring aspects such as membership, decision making, benefit sharing, implementation of governance related provisions, mediation of external services and benefits, and satisfaction of communities towards the CFUGs.

For the purposes of this analysis, the communities most vulnerable to climate change impacts are considered to be those who are poor in terms of their well-being status and belong to so called lower caste in terms of their social status; and those living in vulnerable locations prone to landslide and gullies and scarcity of water (research by the authors, paper in prep.).

### **4.2.1 Membership**

Participants reported that the membership of CFUGs was open to all communities living close to the forests and traditionally depending on forest resources. However, membership in some CFUGs was restricted to certain caste groups and to the recently migrated members. One of the major forms of exclusion in CFUG membership was based on traditional use rights and tenure claimed by certain caste groups. As explained by the participants of FGD:

*“the forest area of Chisapani CFUG was historically under the control of certain upper caste groups. However, following the private forest nationalization policy of the government the forest became public property and the land measurement in 1986 declared the forest as public property. The forest was then handed over to the local community as a community forest in 2005. However, the local elites from dominant caste groups decided to provide membership of the CFUG only to upper caste groups assuming the forest as their ancestral property. The forest was officially handed over to the upper caste groups and the Dalits who were also traditionally residing in the same community were excluded from their membership and user rights. The Dalit communities continuously claimed their user rights as per the provisions of community forestry. Government officials also argued that the membership of community forest should be provided to all households living close to the forests. After some years the community forest management committee decided to provide membership to excluded households but they asked 4,000 Rs from each household as membership fees. Some households paid this amount to become a member but some households who couldn't afford this amount are still excluded. The money collected as membership fees were distributed among upper caste households rather than depositing it in CFUG account. The decision making of this forest is still controlled by local elites and decisions are not transparent to other members”.*

A poor interviewee from Raniswanra CFUG claimed that she was compelled to pay a high membership fees while receiving a new membership of Raniswanra CFUG when she migrated in a village close to the community forest. As she described *“community forest user group is collecting money from new members. The membership fee for new members is 10,000 Rs. This amount is very high for poor members.”* As reported, many very poor and poor households were not able to get membership because of high membership fees. The stories explain how traditional and feudal legacy has been transferred to local institutions and how local elites use their caste and wealth based power to exclude powerless communities from their access to membership. As reported by the research participants similar practices exist in many CFUGs in the district.

### **4.2.2 Decision making**

The household survey data revealed that in 30% of respondent households (total 133) at least one member was in a decision making positions of local institutions. However, participation in decision making positions was varied according to well-being status of the respondents. As reported, 77 % well-off and 24% medium respondents had at least one household member in decision making positions of these institutions. While, none of the poor and very poor households were in the decision making position of those institutions. The Pearson's chi-square test

indicated that there was a significant relationship between participation of respondents in the decision making positions of institutions with their well-being status ( $X^2 = 54.5958$ ,  $df = 3$ ,  $p\text{-value} = 0$ ). However, participation of respondents in decision making positions of local institutions had no significant association with gender of household head or according to case study site.

Similarly, an analysis of executive committees of the four case study CFUGs, revealed that the participation of well-off, medium, poor and very poor well-being groups in the committees in 2012 was 47%, 39%, 11%, and 3% respectively (Table 2). Out of 16 members in the key positions of executive committee, 56% were well-off and 44% were medium, whereas, there was no representation of poor and very poor households in the key decision making positions such as chairperson, vice chairperson, secretary and treasurer (Table 2).

**Table 2 Participation of different well-being groups in the decision making positions of CFUGs**

| Well-being status | Total member households of CFUGs | Committee members | Key positions (Chairperson, vice chair person, secretary and treasurer) in the committee |
|-------------------|----------------------------------|-------------------|--|
| Well-off          | 122 (30%)                        | 18 (47%)          | 9 (56%)  |
| Medium            | 155 (39%)                        | 15 (39%)          | 7 (44%)  |
| Poor              | 82 (20%)                         | 4 (11%)           | 0  |
| Very poor         | 43 (11%)                         | 1 (3%)            | 0  |
| Total numbers     | 402                              | 38                | 16   |

Source: CFUG records

Two examples presented above confirm that the decision making of local institutions is controlled by local elites based on their well-being status and traditionally gained power. The decision making authority of these institutions indicates who makes local rules (and thus holds power and influence), and how these rules affect the members, as seen in the following sections.

### **4.2.3 Benefit sharing**

Benefit sharing practices of local institutions was analyzed using contribution of CFUGs in implementing pro-poor provisions. The implementation of pro-poor provisions mentioned in the revised community forestry guideline was considered as crucial to increase the adaptive capacity of poor and vulnerable communities. The guidelines included mandatory provisions to be carried out by all CFUGs as: i) well-being ranking of CFUG households according to their relative well-being; ii) preparation and implementation of livelihood improvement plan for poor households; iii) allocation of part of the CF land for income generating activities; and iv) allocation of at least 35% of CFUGs' income for pro-poor activities. However, an assessment of the implementation status of pro-poor provisions as per the provision of revised CF guidelines revealed that the CFUGs were not following most of the provisions. Although the CFUGs had carried out well-being ranking and mentioned the outcomes in the constitutions or forest operational plans, the ranking was not used in deciding benefit sharing provisions (Table 3).

**Table 3 Implementation status of pro-poor provisions according to community forestry guideline**

| Major provisions  | Implementation status in different CFUGs      |            |           |          |
|---|---|------------|-----------|----------|
|   | Kataharbari                                   | Raniswanra | Chisapani | Manasalu |
| Well-being ranking of CFUG households                                 | Yes   | Yes        | Yes       | Yes      |
| Preparation and implementation of livelihood implementation plan      | No  | No         | No        | No       |
| Allocation of CF land for income generating activities of poor        | No  | No         | No        | No       |
| Allocation of at least 35% of CFUG income for pro-poor activities     | Nominal amount of interest free loan provided | No         | No        | No       |
| Declaration of kind and cash contribution for poor in the annual plan | No  | No         | No        | No       |

Source: Analysis of interview transcriptions, FGDs and CFUG records

In contrast to the pro-poor policy provisions, the well-being ranking and categorization of households according to well-being status was also opposed by some more well-off interviewees and FGD participants. As one FGD participant explained: *“we are not in favour of well-being ranking and differential prices of forest products for different well-being groups... as the rich have to contribute equally in the CF, the price of forest products should be same for all”*. A district level government official agreed in interview that the policies related to pro-poor resource allocations were not under implementation: *“the provisions of CF guideline are not implemented in most of the CFUGs in this district. As per the guideline 35% of CF income should invest on poverty reduction. But it is not happening in this district”*. An annual monitoring report of district forest office mentioned that the allocation of annual budget for income generation and livelihood improvement activities in 2011 by the CFUGs in the district was only two percent of annual income about 9.5 million NRs.

The local elites who were in decision making positions of CFUGs had their own understanding of poverty and poor. The interviewees mentioned that the poor and *Dalits* were poor and vulnerable because of their internal reasons and behaviors such as drinking alcohol, laziness and not being aware and worried about their own life. The interviewees reported that the local institutions have a limited role in improving the livelihoods of poor. As shared by one of the interviewees in senior position of CFUG and other local institutions: *“Dalit and poor are poor because of their own reason and behaviour. They have to know how to utilize and mobilize resources to get out of poverty”*. However, very poor and poor interviewees described discriminatory practices and exclusion as the major causes pushing them below poverty and sustaining injustice. So, it seems that while the government adopts a progressive approach in terms of drafting CF guidelines with pro-poor provisions, they have not been effective in implementing those policies and monitoring their implementation status.

#### **4.2.4 Implementation of governance related provisions**

The major governance provisions mentioned in the revised CF guidelines were related to participation of all user group members in decision making process,

transparency in decisions, benefit sharing and financial management, accountability of committee members towards weaker sections of CFUG members, and accountability of District Forest Office (DFO) staff in monitoring of CFUGs. Table 4 presents the implementation status of governance related provisions by CFUGs.

**Table 4 Implementation status of governance related provisions according to community forestry guideline**

| Major provisions  | Implementation status in different CFUGs             |  |  |  |
|---|--|--|--|--|
|   | Kataharbari  | Raniswanra   | Chisapani  | Manasalu   |
| Proportionate representation of poor, Dalits, women, indigenous nationalities in the user committees of CFUG              | No   | No   | No   | No   |
| Inclusion of committee members from all villages (toles) of CFUG households   | Yes  | Yes  | Yes  | Yes  |
| Organize public audit by all CFUGs at least once a year ensuring participation of poor, Dalit and women.                  | No   | No   | No   | No   |
| General assembly of the CFUG should assign the auditor  | No   | No   | No   | No   |
| Users' committee is only allowed to spend money according to the annual plan approved by general assembly of users' group | No   | No   | No   | No   |
| CFUGs should report to DFO and other service providers about the progress of livelihood improvement program.              | No   | No   | No   | No   |
| Committee members are considered as equivalent to officers bearing public positions                                       | Committee members were not aware about the provision | Committee members were not aware about the provision | Committee members were not aware about the provision | Committee members were not aware about the provision |
| Include poor as a new member either free of cost or at subsidized membership fees   | No   | Provided nominal subsidy to some poor households     | No   | No   |

Source: Analysis of interview transcriptions, FGDs and CFUG records.

The Table above shows that the CFUGs were not successful in implementing most of the governance related provisions. The only provision implemented by all CFUGs was the representation of committee members from different clusters or toles of CFUG households.

The district level interviewees related to forest office agreed that the mandatory policies such as revised community forestry guideline were not implemented by most of the CFUGs and the concerned authorities were also not able to implement the policies. As mentioned by an interviewee from the district forest office:

*“Community forestry guideline is not implemented by the groups in this district....We have 300 community forest user groups in the district and they are providing services to about 70 percent of the population in the district. Majority of the community forests are passive. The user groups are only active where there is an opportunity to get income. The activity of user groups is focused to*

*grasp benefits. There are only 8-10 CFUGs in the district operating according to the concept, policy and provisions of community forestry”.*

The same interviewee further mentioned that the governance of community forestry user groups was very weak and many groups were controlled by certain number of elites: *“40-50 percent CFUGS are run by single man and no other persons than a single man knows what is happening. 10-20 percent groups are being managed by 4-5 persons. There might be only 10 percent CFUGs where there is participation of all user group members....In the past, only the government staffs were involved in corruption but now user group members are also involved in corruption”.* The statement indicates that the government office was not capable enough to control the elite domination in the community forests and corruption has been further institutionalized in the society.

#### **4.2.5 Mediation of external services and benefits**

One of the major expected roles of CFUGs, in the context of climate change adaptation, is to mediate external services as per the adaptation needs of local communities. Interviewees reported that local adaptation needs are multidimensional in nature and it is only possible to achieve by coordination of services by many organizations. Interviewees who were in executive committee of CFUGs, reported that they were able to influence district level government offices, such as forest, agriculture, women’s development and soil conservation offices for cash and material support in activities such as landslide control, soil conservation and other community development activities. Interviewees identified the role of CFUGs in approaching and influencing district and national NGOs to bring capacity building and income generating activities to their village.

However, in contrast to this opinion, very poor and poor research participants claimed that CFUGs as local institutions were even hindering them to get access to benefits and services provided by government and other organizations. As reported by a very poor interviewee: *“there are many government programs in favour of poor but the locals don't allow implementing them. The local headmen get benefit, nothing for poor. It is all for those who can speak, nothing for voiceless”.* Another very poor interviewee explained: *“government is providing benefits but we can't get it in the village as local institutions don't support us”.* One district level government interviewee from the forest office stated that the local elites in key positions of local institutions were limiting the access of government officials to poor households with pro-poor provisions. As he mentioned: *“there is elite domination and poor and marginalized are expecting the role of government to implement pro-poor provisions. But the elites have political protection....local elites don't allow government in outreaching benefits and services to the poor people”.* In contrast to the expected role of local institutions in influencing external agencies in favor of poor and vulnerable, the CFUGs were blamed as creating obstacles in outreach and benefits of services to the poor households. Given the tendency of government and national and international aid organizations to implement their programs in rural areas through local institutions as implementing partners, the above analysis identifies a challenge for external organizations who seek to engage with vulnerable communities and support their adaptation needs through the platforms of local institutions such as CFUGs.

#### 4.2.6 Satisfaction with services and functions of CFUGs

The survey data revealed that over 75% of respondents were very satisfied or satisfied with the functions and current services of CFUGs. However, 63% of very poor and about 28% of poor respondents expressed their dissatisfaction with the functions of CFUGs. The satisfaction of respondents with the current roles and functions of CFUGs had a significant relationship with their well-being status (Pearson's  $X^2 = 83.1444$ ,  $df = 12$ ,  $p\text{-value} = 0$ ) (Table 5).

**Table 5 Respondent's satisfaction with roles and functions of CFUGs**

| Level of satisfaction | No. of responses according to well-being groups |                  |                |                     |               |
|-----------------------|---|------------------|----------------|---------------------|---------------|
|                       | Well-off<br>(n=38)                              | Medium<br>(n=50) | Poor<br>(n=29) | Very poor<br>(n=16) | Total (n=133) |
| Very satisfied        | 25  | 12               | 2              | 0                   | 39 (29 %)     |
| Satisfied             | 13  | 31               | 17             | 3                   | 64 (48 %)     |
| Neutral               | 0   | 3                | 2              | 3                   | 8 (6 %)       |
| Not satisfied         | 0   | 4                | 8              | 7                   | 19 (14 %)     |
| Very dissatisfied     | 0   | 0                | 0              | 3                   | 3 (2 %)       |

Source: Analysis of household survey data

Interviewees expressed their satisfaction with the roles and functions of CFUGs was mainly due to contribution of CFUGs in managing and conserving natural resources (such as forest, water and soil) and accessing external services for local benefits. As reported by these interviewees, the efforts were successful in promoting collective actions and to reduce climate change vulnerability and risks in the communities. The very poor and poor interviewees who expressed their dissatisfaction claimed the local institutions that were formed by local elites and well-off for their own interest and the poor had no benefits from the CFUGs. One of the very poor and *Dalit* interviewees expressed her frustrations with local institutions as she realized that benefits from these institutions were always utilized by well-off households: *"I don't have trust with these institutions. Everything is for rich and there is nothing for poor in this village..... All the local institutions are for those who can speak. Whatever benefits comes to this village, it is all for those who can speak". The local institutions are made by rich people for their own benefit"*. There were many stories of this nature expressed by very poor and poor interviewees. The frustration expressed by the interviewees was due to various practices and behaviors of CFUGs such as exclusion in membership, discrimination in benefit sharing and obstacles in access to services and benefits by poor and vulnerable communities.

Despite these issues and concerns, very limited efforts were made to improve the governance and transformation of CFUGs in favor of poor and vulnerable communities. Most of the persons in the decision making positions had their connection with political parties and the political connections were also used to gain power and to continue impunity. As reported by one of the interviewees affiliated with district level forest office: *"the local elites who are in key positions of CFUGs have political protection. If we do initiate any actions against them the matter goes to political party leaders"*.

Although, the functions of CFUGs were supporting collective actions and somehow successful in reducing collective vulnerabilities, the actions were not found to be effective in reducing individual vulnerabilities, especially in addressing the vulnerabilities of the most vulnerable population. The exclusion and discrimination of vulnerable communities from access to and utilization of resources has been reported as injustice and a violation of human rights by very poor and poor communities.

### 4.3 Characteristics and functions required in CFUGs to support most vulnerable for climate change adaptation

Research participants, in general, recognized that the CFUG could be one of the potential institutions to enable local communities for climate change adaptation. However, the interviewees also reported changes required in CFUGs in terms of institutional characteristics and functions to enable the most vulnerable communities for climate change adaptation. The reported characteristics and functions are analyzed in different themes as (i) improved governance; (ii) focus on livelihoods improvement; (iii) strengthening and leveraging social capital; (iv) contribution in food security; (v) reducing disaster risks; (vi) external coordination and linkages; (vii) and secured ownership. Table 6 provides a quantification of the number of responses under each of these themes, and further categorised for the number of respondents in different well-being groups.

**Table 6 Changes required in CFUGs to enable climate change adaptation**

| Changes required in CFUGs to enable pro-poor adaptation | Percentage of responses according to well-being groups |               |             |                  |              |
|---|--|---------------|-------------|------------------|--------------|
|   | Well-off (n=12)  | Medium (n=13) | Poor (n=13) | Very poor (n=12) | Total (n=50) |
| Improved governance                                     | 58   | 54            | 46          | 83               | 66           |
| Focus on livelihoods improvement                        | 57   | 38            | 31          | 50               | 46           |
| Strengthening social capital                            | 50   | 46            | 23          | 33               | 38           |
| Contribution in food security                           | 25   | 62            | 38          | 17               | 36           |
| Reducing disaster risks                                 | 42   | 23            | 23          | 25               | 28           |
| External coordination and linkages                      | 42   | 31            | 8           | 25               | 26           |
| Secured ownership                                       | 42   | 0             | 8           | 8                | 14           |

Source: Analysis of interview transcriptions

Not surprisingly, the proposed changes in characteristics and functions of local institutions also varied according to the well-being status of the interviewees. Higher percentages of very poor and poor interviewees were in favour of improved governance, pro-poor and vulnerable focused policies and programs, and solidarity and critical mass of poor and vulnerable. On the other hand, the well-off and medium interviewees had an interest in enhancing institutional knowledge and capacity for climate change adaptation, external linkage and coordination and disaster risk reduction and relief activities.

## 5. DISCUSSION

The role of CFUGs as local institutions were recognized as having potential to contribute to climate change adaptation, based on their authority, role and mandate



in managing local resources through the mobilization of local communities. Although, current understanding, knowledge and capacity of the CFUGs was not adequate, these institutions had a very high potential in analyzing climate vulnerabilities, mobilizing local resources and linking local issues to mediate external organizations. The findings support the crucial role of CFUGs as a local institution supporting local communities on local level adaptation planning and implementation as highlighted by previous studies (Agrawal and Perrin 2008).

The knowledge and experience gained by CFUGs in managing common pool resources could reduce vulnerabilities, disaster risks and enhance adaptation capacity of local communities. However, most of the contributions were targeted at reducing collective vulnerabilities of communities with little focus on addressing individual vulnerabilities of communities, particularly the most vulnerable. As mentioned in the literature (Adger 1999, 2003), the study showed that individual and collective vulnerabilities were caused by different factors requiring different strategies to address individual and collective vulnerabilities.

The poor and most vulnerable communities lacked trust and ownership of CFUGs as local institutions, largely due to exclusion from membership and decision making, discrimination in sharing benefits and obstructing and manipulating external services targeted to vulnerable communities. As reported, the elites in local institutions were promoting and sustaining caste, gender and class based discriminations and exclusion of poor and marginalized from access to resources, services and the benefit sharing system. Local elites were not in favor of delegating authority and power to poorer community members. Unequal power relations and the continued dependency of the poor were benefiting local elites and sustaining power relationships.

The inequity in participation and benefit sharing based on caste, class and gender has been well reported by authors in the similar context (Adhikari and Di Falco 2009; Agrawal 2001; Jones and Boyd 2011). Local institutions represent the society and functions as a sub-set of the society. The discriminatory, exclusive and dominant practices adopted by the elites in decision making positions of the CFUGs, may not be formed by CFUGs themselves. Rather the practices are transferred from the society where such practices exist as a legacy of feudal, patriarchal and caste based dominations. However, it is not known whether civil society institutions may influence the society at large to reduce and end such anomalous practices or whether those practices of local institutions may only be reduced through societal influence.

A general trend was observed that the local institutions such as CFUGs were increasingly considered as partners of government and donor agencies to implement their programs in the communities. The constituency of local institutions and their capacity to mobilize and leverage local resources has been considered as their asset to achieve the targets of external organizations. This is exhibited by government recognition of CFUGs as the key implementing agencies of the national adaptation program of action to climate change (MoE 2010, 21). Although the priorities and policies of government and donor agencies intend to reach and serve the most vulnerable groups, this research finds that the most vulnerable groups are in fact not receiving the intended benefits from the CFUGs. This has an implication for the ongoing expectations of external agencies of the outcomes of partnerships with

CFUGs as local institutions. Continuation of such partnership without improving and transforming the structure and governance of CFUGs may further disenfranchise poor and vulnerable communities from the benefits of climate change adaptation initiatives.

The results showed that the poor and vulnerable communities were not able to exercise core human rights such as equality and non-discrimination, participation and empowerment, and accountability as guaranteed by international declarations of human rights (Evans 2009). Civil society organizations often promote and claim justice and human rights of citizens. However, how the members of local institutions such as CFUGs claim and exercise their rights and how these rights are respected, protected and fulfilled within the framework of civil society managed local institutions is not apparent. Changes in the functions and characteristics of CFUGs are recommended by communities largely according to their well-being status. The most vulnerable communities were in favor of reform in policies, programs and governance of local institutions. Conversely, well-off respondents were more engaged in how local institutions could become more technically competent in designing coordinating and implementing climate change adaptation programs in the future.

## **6. CONCLUSION**

The role of CFUGs as local institutions has been explored in terms of the ability to enable vulnerable communities to adapt when faced with increasing difficulties from the impacts of climate change. The research revealed that CFUGs were well established in the research sites and relatively successful in managing local resources as common property and in reducing collective vulnerability in the context of climate change. Involvement of CFUGs in designing, implementing and coordinating climate change adaptation related activities is an additional responsibility demanded by communities. CFUGs as local institutions are considered by external agencies to be the most appropriate entry point to access the poor through pro-poor initiative and hence become partners in adaption programs. Analysis of institutional capacity and governance of CFUGs from the perspectives of the most vulnerable was found to be an important consideration when informing policy and practice. Climate change adaptation in rural and remote hills of Nepal is occurring, and the roles, responsibilities and challenges of local institutions are expected to change to meet the expectations. Enhancing understanding knowledge and skills on impacts of climate vulnerabilities as well as selection and implementation of appropriate adaptation measures are areas of improvement for CFUGs. More importantly, how CFUGs improve their internal governance and delegate authority and power to the most vulnerable and poor will increasingly challenge the system of governance. Transformation in structure, governance and the attitudes of decision makers in CFUGs is required to build trust and to equitably equip most vulnerable communities to enable them in climate change adaptation. Transformation is also required at agency and government level in the implementation and monitoring of outcomes of policies and programs to enhance adaptation amongst the most vulnerable.

## LITERATURE CITED

- Acharya, K.P., and P. Gentle. 2005. Improving the effectiveness of collective action: Sharing experiences from community forestry in Nepal. *CAPRI Working Paper* 54:17-21.
- Adger, W. N. 1999. Social vulnerability to climate change and extremes in coastal Vietnam. *World Development* 27 (2):249-269.
- Adger, W.N. 2003. Social Capital, Collective Action, and Adaptation to Climate Change. *Economic Geography* 79 (4):387-404.
- Adger, W.N. 2000. Institutional adaptation to environmental risk under the transition in Vietnam. *Annals of the Association of American Geographers* 90 (4):738-758.
- Adger, W.N., S. Huq, K. Brown, D. Conway, and M. Hulme. 2003. Adaptation to climate change in the developing world. *Progress in Development Studies* 3 (3):179-195.
- Adhikari, B., and S. Di Falco. 2009. Social inequality, local leadership and collective action: an empirical study of forest commons. *European Journal of Development Research* 21 (2):179-194.
- Agarwal, B. 2010. Does women's proportional strength affect their participation? Governing local forests in South Asia. *World Development* 38 (1):98-112.
- Agrawal, A. 2001. Common property institutions and sustainable governance of resources. *World Development* 29 (10):1649-1672.
- Agrawal, A. 2008. The role of local institutions in adaptation to climate change. *International Forestry Research and Institutions Program (IFRI) Working Paper*.
- Agrawal, A. 2010. Local institutions and adaptation to climate change. In *Social dimensions of climate change: equity and vulnerability in a warming world*, edited by R. N. Mearns, A. . Washington: The World Bank.
- Agrawal, A., D.G. Brown, G. Rao, R. Riolo, D.T. Robinson, and M. Bommarito II. 2013. Interactions between organizations and networks in common-pool resource governance. *Environmental Science & Policy* 25:138-146.
- Agrawal, A., and N. Perrin. 2008. Climate adaptation, local institutions and rural livelihoods. In *IFRI Working Paper # W081-6*. Michigan: International Forestry Resources and Institutions Program, University of Michigan.
- Agrawal, A., and G. Yadama. 1997. How do local institutions mediate market and population pressures on resources? Forest Panchayats in Kumaon, India. *Development and Change* 28 (3):435-465.
- Alexander, K.S., J. Millar, and N. Lipscombe. 2010. Sustainable development in the uplands of Lao PDR. *Sustainable Development* 18 (1):62-70.
- Andersson, K., and A. Agrawal. 2011. Inequalities, institutions, and forest commons. *Global Environmental Change* 21:866-875.
- Baland, J.M., and J.P. Platteau. 1996. *Halting degradation of natural resources: is there a role for rural communities?*: Food & Agriculture Organization, Rome.
- Bennett, L., S. Tamang, P. Onta, and M. Thapa. 2006. *Unequal citizens: Gender, caste and ethnic exclusion in Nepal*, . Kathmandu: Department for International Development and The World Bank.
- Berkes, F., ed. 1989. *Common property resources. Ecology and community-based sustainable development*. London: Belhaven Press.
- Bromley, D.W. 1989. *Economic interests and institutions: The conceptual foundations of public policy*. Basil Blackwell New York.

- CBS (Central Bureau of Statistics). 2011. Nepal living standard survey 2010/2011. edited by CBS. Kathmandu: Central Bureau of Statistics, National Planning Commission Secretariat, Government of Nepal.
- Clark, C.W. 1973. The economics of overexploitation. *Science* 181 (4100):630.
- Cox, M., G. Arnold, and S.V. Tomás. 2010. A review of design principles for community-based natural resource management. *Ecology and Society* 15 (4):38.
- Creswell, J. W. 1994. *Research design: Qualitative and quantitative approaches*. Thousand Oaks, CA: Sage.
- DoF (Department of Forests). 2011. CFUG Database, September 2011. Kathmandu: Department of Forests, Nepal.
- DFO (District Forest Office). 2012. *Monitoring and evaluation of community forest user groups*. Lamjung: District Forest Office.
- Eakin, H. 2005. Institutional change, climate risk, and rural vulnerability: cases from Central Mexico. *World Development* 33 (11):1923-1938.
- Evans, D.G. 2009. Human rights and state fragility: Conceptual foundations and strategic directions for state-building. *Journal of Human Rights Practice* 1 (2):181-207.
- Feeny, D., F. Berkes, B.J. McCay, and J.M. Acheson. 1990. The tragedy of the commons: twenty-two years later. *Human Ecology* 18 (1):1-19.
- Gentle, P., K.P. Acharya, and G.R. Dahal. 2007. Advocacy campaign to improve governance in community forestry: A case from western Nepal. *Journal of Forest and Livelihoods* 6 (1):59-69.
- Gentle, P., and T.N. Maraseni. 2012. Climate change, poverty and livelihoods: adaptation practices by rural mountain communities in Nepal. *Environmental Science & Policy* 21:24-34.
- GoN (Government of Nepal). 2012. National population and housing census 2011 (National Report). Kathmandu: National Planning Commission, Central Bureau of Statistics, Government of Nepal.
- GoN (Government of Nepal). 2009. Guidelines for community forestry program. Kathmandu: Ministry of Forests and Soil Conservation, Nepal.
- Hughes, E. 1993. Status, property and forest management: Women's role in community forestry in Nepal. *TRI NEWS* 12 (2):46-49.
- IISD (International Institute for Sustainable Development). 2003. Livelihoods and climate change: Combining disaster risk reduction, natural resources management and climate change adaptation to reduce vulnerability and poverty. In *Information Paper 2: International Institute for Sustainable Development*.
- IPCC (Intergovernmental Panel on Climate Change). 2007. *Climate Change 2007: impacts, adaptation and vulnerability: contribution of Working Group II to the fourth assessment report of the Intergovernmental Panel on Climate Change*: Cambridge Univ Press.
- Johnson, R.B., A.J. Onwuegbuzie, and L.A. Turner. 2007. Toward a definition of mixed methods research. *Journal of mixed methods research* 1 (2):112-133.
- Jones, L., and E. Boyd. 2011. Exploring social barriers to adaptation: Insights from western Nepal. *Global Environmental Change* 21 (4):1262-1274.
- Kanel, K. 2008. So far so good: Next steps in community forestry. In *Promise Trust and Evolution: Managing the Commons of South Asia*, edited by R. Ghate, N. N. Jodha and P. Mukhopadhyay. New York: Oxford University Press Inc.
- Kanel, K.R. 2004. Twenty five years of community forestry: contribution to millennium development goals. Paper read at Fourth national workshop on community forestry, at Kathmandu, Nepal.

- Kellert, S.R., J.N. Mehta, S.A. Ebbin, and L.L. Lichtenfeld. 2000. Community natural resource management: Promise, rhetoric, and reality. *Society & Natural Resources* 13 (8):705-715.
- Lam, W.F. 1998. *Governing irrigation systems in Nepal: institutions, infrastructure, and collective action*. Oakland: Institute for Contemporary Studies.
- Larson, B.A., and D.W. Bromley. 1990. Property rights, externalities, and resource degradation: Locating the tragedy. *Journal of Development Economics* 33 (2):235-262.
- Lim, B., E. Spanger-Siegfried, I. Burton, E.L. Malone, and S. Huq. 2005. *Adaptation policy frameworks for climate change: Developing strategies, policies and measures*. Cambridge: Cambridge University Press, UK.
- McMurray, A., R.W. Pace, and D. Scott. 2004. *Research: A commonsense approach*. Thomson: Social Science Press.
- Meinzen-Dick, R., M. DiGregorio, and N. McCarthy. 2004. Methods for studying collective action in rural development. *Agricultural Systems* 82 (3):197-214.
- Meinzen-Dick, R.S., and M. Di Gregorio. 2004. Collective action and property rights for sustainable development. International Food Policy Research Institute, CGIAR Systemwide Program on Collective Action Property Rights.
- MoE (Ministry of Environment). 2010. National Adaptation Programme of Action (NAPA), . Kathmandu: Ministry of Environment, Government of Nepal.
- Moser, C. 1996. *Confronting crisis: A comparative study of household responses to poverty and vulnerability in four poor urban communities*. Washington: The World Bank.
- Moser, Susanne C. 2010. Now more than ever: The need for more societally relevant research on vulnerability and adaptation to climate change. *Applied Geography* 30 (4):464-474.
- Mosse, D. 1994. Authority, gender and knowledge: theoretical reflections on the practice of participatory rural appraisal. *Development and Change* 25 (3):497-526.
- Narayan-Parker, D. 1997. *Voices of the poor: Poverty and social capital in Tanzania*. Washington: The World Bank.
- Nightingale, A.J. 2002. Participating or just sitting in? The dynamics of gender and caste in community forestry. *Journal of Forest and Livelihood* 2 (1):91-104.
- North, D.C. 1994. Economic performance through time. *The American Economic Review* 84 (3):359-368.
- Ostrom, E. 1986. An agenda for the study of institutions. *Public Choice* 48 (1):3-25.
- Ostrom, E. 1990. *Governing the commons*. New York: Cambridge.
- Ostrom, E. 1992. *Crafting institutions for self-governing irrigation systems*. San Francisco: Institute for Contemporary Studies.
- Ostrom, E. 2005. Understanding institutional diversity. *Public Choice* 132 (3):509-511.
- Ostrom, E. 2010. Polycentric systems for coping with collective action and global environmental change. *Global Environmental Change* 20:550-557.
- Paavola, J., and W.N. Adger. 2002. Justice and adaptation to climate change. *Tyndall Centre Working Paper* 23.
- Paavola, J., and W.N. Adger. 2006. Fair adaptation to climate change. *Ecological Economics* 56 (4):594-609.
- Paudel, D., S.J. Keeling, and D. R. Khanal. 2006. Forest products verification in Nepal and the work of the commission to investigate and abuse of authority. *Verifor Country case study* 10.

- Paudel, D., D.B. Khatri, and G. Paudel. 2010. Corpo-bureaucratizing community forestry: Commercialization and the increased financial transaction in community forestry user groups in Nepal. *Journal of Forest and Livelihood* 9 (1):1-15.
- Pelling, M., and C. High. 2005. Social learning and adaptation to climate change. *Benfield Hazard Research Centre, Disaster Studies Working Paper* 11:1-19.
- Pelling, M., and C. High. 2005. Understanding adaptation: what can social capital offer assessments of adaptive capacity? *Global Environmental Change* 15 (4):308-319.
- Pokharel, B.K., and S. Byrne. 2009. Climate change mitigation and adaptation strategies in Nepal's forest sector: how can rural communities benefit? Discussion Paper No 7. Nepal Swiss Community Forestry Project.
- Poteete, A.R., and E. Ostrom. 2004. In pursuit of comparable concepts and data about collective action. *Agricultural Systems* 82 (3):215-232.
- Pretty, J., and H. Ward. 2001. Social capital and the environment. *World Development* 29 (2):209-227.
- Robledo, C., M. Fischler, and A. Patiño. 2004. Increasing the resilience of hillside communities in Bolivia. *Mountain Research and Development* 24 (1):14-18.
- Rodima-Taylor, D., M.F. Olwig, and N. Chhetri. 2011. Adaptation as innovation, innovation as adaptation: An institutional approach to climate change. *Applied Geography* 33:107-111.
- Scott, J., and G. Marshall. 2009. *Dictionary of Sociology*. New York: Oxford University Press.
- Smit, B., Pilifosova, O., Burton, I., Challenger, B., Huq, S., Klein, R.J.T., & Yohe, G., 2007. Adaptation to climate change in the context of sustainable development and equity. In *Climate change 2007: impacts, adaptation and vulnerability. In Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by M. Parry, Canziani, O., Palutikof, J., Linden, P., & Hanson, C. Geneva.
- Tashakkori, A., and C. Teddlie. 2003. *Handbook of mixed methods in social & behavioral research*. Thousand Oaks: Sage Publications, Inc.
- Thoms, C.A. 2008. Community control of resources and the challenge of improving local livelihoods: A critical examination of community forestry in Nepal. *Geoforum* 39 (3):1452-1465.
- TI (Transparency International). 2012. Corruption perception index 2012. Transparency International. <http://www.transparency.org/cpi2012/results>.
- Tiwary, R. 2006. Explanations in resource inequality: Exploring scheduled caste position in water access structure. *International Journal of Rural Management* 2 (1):85-106.
- Uphoff, N., L. Buck, and J. Sjorslev. 2006. Strengthening rural local institutional capacities for sustainable livelihoods and equitable development. Social Development Department. Washington DC: The World Bank.
- Vatn, A. 2009. An institutional analysis of methods for environmental appraisal. *Ecological Economics* 68 (8-9):2207-2215.
- Vernon, Tamsin. 2008. The Economic Case for Pro-Poor Adaptation: What do we Know? *IDS Bulletin* 39 (4):32-41.
- Wade, R. 1988. *Village republics: Economic conditions for collective action in South India*. New York: Cambridge University Press.
- Young, O.R. 2010. Institutional dynamics: Resilience, vulnerability and adaptation in environmental and resource regimes. *Global Environmental Change* 20 (3):378-385.