Institutional adaptive capacity and climate change response in the Congo Basin forests of Central Africa

H. Carolyn Peach Brown  
University of Prince Edward Island  
Charlottetown, PEI, CANADA  
hcpbrown@upei.ca

Denis J. Sonwa  
Center for International Forestry Research (CIFOR)  
Yaoundé, Cameroon

Olufunso Somorin  
Wageningen University and Center for International Forestry Research (CIFOR)  
Yaoundé, Cameroon

Abstract:

Climate change presents challenges to Central African countries containing the Congo Basin rainforest. The population is vulnerable to the effects of climate change and forest-dependent communities are vulnerable to changing policy that may affect their access to forest resources. Using a qualitative approach to data collection, the perception of decision-makers within, and the response of the institutions of the state, the private sector and civil society to challenges of climate change in Cameroon, Central African Republic, and the Democratic Republic of Congo were analysed. Results indicate that while decision-makers’ awareness of climate change is high, institutional response is at an early stage. Low adaptive capacity is constrained by under-developed linkages among government institutions nationally and between different levels of government and with communities. Adaptive capacity could be enhanced by facilitating institutional linkages and coordinating multilevel responses across all boundaries of government, private sector and civil society.

Keywords: Congo Basin forest; climate change; institutions; perception; adaptive capacity

1. Introduction

Predicted future changes in climate, with consequent impacts on ecosystems and physical systems, pose significant challenges for society. Forests are expected to face significant pressure from climate change over the next century which will potentially disrupt the important ecological, economic, social, and aesthetic services that forests provide to other natural systems and humankind (Bonan, 2008; Eastaugh, 2008; Intergovernmental Panel on Climate Change (IPCC), 2007b). Such future changes will have a strong impact on natural resource-dependent communities through a multitude of primary and secondary effects in both natural and social systems (Adger, 2003). In Africa, over two-thirds of the population of approximately one billion people, rely directly or indirectly on forests and woodlands for their livelihood, as well as medicinal plants and common pool forest resources for meeting essential fuel wood, grazing, and other needs (The World Bank, 2004). Similar patterns of dependency are observed in the Congo
Basin Forests of Central Africa whose over 30 million inhabitants, representing over 150 ethnic groups, depend on the forest for food, shelter, and other livelihood activities (Congo Basin Forest Partnership, 2006). The majority of the close to 100 million inhabitants of the Congo Basin sub-region lives in poverty. The Democratic Republic of Congo (DRC) and the Central African Republic (CAR), with close to three-quarters of the population, are classified among the lowest income countries in the world (The World Bank, 2010). The vulnerability of tropical forest ecosystems to climate change represents a risk to the livelihoods of forest-dependent communities and the development of national economies. This vulnerability is exacerbated by historical and contemporary problems related to natural resource mismanagement, conflict and inequality (Annecke, 2002; Dixon et al., 2003).

As the second largest contiguous rainforest in the world, the Congo Basin represents a carbon reserve of global significance for regulating greenhouse gas emissions (Congo Basin Forest Partnership, 2006; Hoare, 2007). It harbours extraordinary levels of biodiversity, and performs valuable ecological services both locally and regionally, such as maintenance of water quantity and quality. The Congo Basin has become prominent in discussions on payments for ecosystem services through the Clean Development Mechanism (CDM), the voluntary carbon market or Reducing Emissions from Deforestation and Degradation (REDD+) which many feel have the potential to contribute to multiple goals in the areas of climate change mitigation, forest conservation, economic development and poverty reduction (Angelsen and Wunder, 2003; Luttrell et al., 2007; Streck et al., 2008). These various approaches present both scientific and policy challenges if they are to be effective, feasible and equitable; particularly for low-income communities (Boyd et al., 2007; Hoare, 2007; Rights and Resources Initiative, 2008; Streck et al., 2008).

In the Congo Basin, as in many African countries, the state is the sole guardian and chief manager of all forests in the country and has the exclusive right to exclude and allocate rights to economically exploit forest resources to the local population and corporate companies (German et al., 2010; Van den Berg and Biesbrouck, 2000). Furthermore, actors in civil society play an important role in interfacing with the local population on issues related to conservation and sustainable development of forest resources. The complexity of managing such an important social-ecological system underscores the importance of searching for ways to enhance the capacity of the system to respond to the challenge.

In social-ecological systems, the existence of institutions and networks that learn and store knowledge and experience, create flexibility in problem solving and balance power among interest groups, play an important role in enhancing adaptive capacity (Pahl-Wostl, 2009; Tompkins and Adger, 2004; Walker et al., 2006). Interactions between local and higher level institutions affect the capacity of communities to respond to change (Adger et al., 2005; Agrawal, 2008; Smit and Wandel, 2006). In climate change research, the institutions of the state, the market, and civil organizations have been found to play an important role in determining response to changing environmental and policy conditions and risks (Adger, 2000; Adger and Vincent, 2005; Smit and Wandel, 2006). Studies have shown that a significant factor influencing the climate policies that are adopted is the way in which decision-makers perceive climate change (Koch et al., 2007; Pielke, 1998). These perceptions can be a reflection of differing types of knowledge, assumptions and value judgements, which are not independent of their
institutional and political context (Bozmoski and Hultman, 2009; Newell, 2009; Novotny Couto Pereira, 2010).

The aim of this research is to analyse the perceptions of decision-makers within, and the response of the institutions of the state, the private sector and civil society to the complex challenges of climate change in three Congo Basin countries; Cameroon, CAR and DRC. Following description of the research methods, interview results of how different representatives of the various institutions perceive climate change and its impact on their country are presented. Additionally, the current strategic priorities of the different institutions to address climate change are outlined. A multi-level governance framework is used to analyse the networks occurring between different institutions, as well as other important stakeholders. The paper concludes with a discussion of the results and suggests opportunities for building adaptive capacity to climate change in the region.

2. Methods

This research was carried out in the Republic of Cameroon, the CAR and DRC, three countries in Central Africa whose land surface area contains the greater majority of the Congo Basin forest (Figure 1). While there are many formal and informal institutions at different levels that could potentially have been included in this study, for the purposes of this research we focused on formal national, regional and international institutions because of their involvement in climate change or forest issues or because of the impact climate change might have on them in the future (Table 1). The selected institutions represented various government ministries, regional and international institutions, the private sector and civil society.

The representatives of the institutions were chosen for interviews because of their knowledge or involvement in the climate change debate. Where there was no active institutional participation on climate change issues, the positions of those chosen exposed them to the issues in general terms. In most cases, one respondent from each institution was interviewed; however, sometimes several representatives of an institution were interviewed separately or participated in a group interview. Semi-structured, open-ended interviews were conducted following the key themes of respondents’ perception of the effects of climate change on their country’s population and in particular the Congo Basin forest area. Additionally, institutional strategic priorities related to climate change mitigation and adaptation were outlined. Use of this approach in data collection allows the interviewer to use a guide to explore similar questions with all the institutional representatives, with the flexibility necessary to ask further questions in order to elucidate the subject (Patton, 2002). A multi-level governance framework was used to analyse the relationships occurring among different institutions and with other important stakeholders specifically related to climate change (Keskitalo, 2004; Koch et al., 2007). Linkages were classified as non-existent, weak (little or no contact), moderate (occasional contact) and strong (ongoing regular contact). Comparisons were drawn across institutions and countries.
Twenty-seven interviews were conducted in Cameroon in September and October 2008. In December 2009, 26 interviews were conducted in CAR. Forty-five interviews were conducted in November 2009 and January and February 2010 in DRC. Interviews were conducted in French or English, depending on the preference of the person being interviewed and were digitally recorded for later transcription. Direct quotations from French have been translated into English. Interview data were supplemented by a review of relevant documents, strategies, press releases and government statements related to the key themes. Content analysis of the data was done in order to identify, code and categorize the patterns in the data following the key themes (Patton, 2002).
Table 1: Summary of participating institutions by country.

<table>
<thead>
<tr>
<th>Country</th>
<th>Government</th>
<th>International NGO</th>
<th>National NGO</th>
<th>Private Sector*</th>
<th>International Organization</th>
<th>Other**</th>
</tr>
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<tbody>
<tr>
<td>Cameroon</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>CAR</td>
<td>5</td>
<td>1</td>
<td>8</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>DRC</td>
<td>14***</td>
<td>5</td>
<td>8</td>
<td>4</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>10</td>
<td>20</td>
<td>10</td>
<td>13</td>
<td>5</td>
</tr>
</tbody>
</table>

* In Cameroon, six private forestry companies were interviewed. In DRC three private forestry companies as well as the General Secretary of the Forest Industries Federation, which represents most of the approximately 20 forestry companies in DRC, was interviewed. Information on the forestry sector in CAR was obtained from the internationally funded Forest Management Plan Implementation Support Program which provides support for the development of forest management plans. This is included under International Organizations.

** Includes regional organizations and universities.

*** Since the Ministry of Environment, Nature Conservation and Tourism is composed of multiple branches, each of the six branches interviewed was counted as a separate institution.

3. Results

3.1 Perceptions of impact of climate change

Respondents in all three countries were aware of the issue of climate change and most felt that it was already evident in their country. They described changes in the agricultural calendar, including a much wider variation in the timing of rains and the length of the dry season. They felt this would make it difficult for people to know when to burn their fields and plant their crops, which could lead to a drop in productivity. A respondent from the agricultural research centre in DRC said that the same quantity of rain is falling but instead it is falling in a shorter period which affects the timing of planting. It also affects erosion which in some areas is exacerbated by deforestation for firewood.

There was broad consensus across countries and institutions that the rural population would be most affected by climate change. Seventy to ninety percent of the population in these countries are rural small-holder farmers who are dependent on subsistence, rain fed agriculture as a source of livelihood. Therefore, any changes in the agricultural calendar will have a potentially negative effect on the population. It was suggested by one NGO that this may already be leading people to leave the rural area. In CAR, there was also some indication that people are able to do more crop rotations each year, which could lead to an increase in productivity.

Respondents also said that streams were drying up earlier in the dry season which means that people have to go further to get water. They said this would primarily affect women and children and have a negative effect on home life. There was also mention that river transport was being affected as there are fewer months of navigability on some rivers. Respondents said that flooding has become more frequent during the rainy season. A flood had occurred in July 2009 in Bangui, the capital city of CAR, and in December when the research was conducted, people were still displaced and living in tents. Respondents felt that these types of events would increase with climate change.
While acknowledging the direct effects of climate change, respondents felt that any changes in the forests would happen in the long term. They stated that climate change would have an effect on biodiversity in the forest zone, which could lead to changes in the range of some species of plants and animals and possibly their ultimate disappearance. In DRC a respondent from the Kisantu Botanical Garden said that differences were noted in 2009 in the timing of the flowering of some plants. Respondents also suggested that the low water level of some lakes and streams will affect fish populations. These changes in turn would have a negative effect on local communities who depend on the forest for their livelihood. They felt that these changes in the forest would affect indigenous hunter-gather populations differently than agriculturalists.

Respondents also suggested that climate change could affect the distribution and incidence of disease in the long term. There was also concern that climate change would exacerbate other issues of unsustainable use of forests or water. In Cameroon, respondents also suggested that an indirect effect of climate change on the forest could result from increased migration from the north to the southern part of the country, which would place pressure on forest resources. The northern part of Cameroon is part of the Sudano-Sahelian zone, and respondents suggested that climate change would be more prominent in the short term in this region leading to increasing variability in the timing and amount of rainfall. In CAR, which also has large dry regions, some respondents felt that a longer dry season has led to more fires in savannah forests.

In DRC, one international NGO representative said that since the country has over 60 percent forest cover, it has a buffer against climate change compared to other parts of Africa. However, a potential long term effect of climate change might be a drastic reduction in the water in the Congo Basin which would be devastating not only for the region but also the rest of Africa. He felt that with the discussions around the diversion of rivers to replenish Lake Chad, it perhaps could become a reality in the very long term. All respondents in all countries felt that climate change would exacerbate unsustainable forest practices leading to deforestation and desertification in the long term.

Respondents from forestry companies in DRC, in general, did not feel that they had noticed any impact of climate change. They are aware of the international discussion but it has not affected their work. There are some changes in seasons from year to year but most respondents felt that it was a result of climate variability rather than long term climate change. They suggested that local people may be attributing climate variability or the result of other issues of natural resource degradation to climate change, just because they have heard of it on the radio and TV. However, in Cameroon, the forestry companies conceded that some of the variability in the climate could be due to climate change. One international NGO respondent said that he felt that ongoing conflict as well as other issues such as political decisions, land use decisions, population growth, or demand for firewood around larger urban centres was of greater importance in terms of its negative effect on the environment and population than climate change.
3.2 Priority of climate change in institutional operations

Climate change was just coming to the fore as a priority in most institutions interviewed in all three countries, and any concrete action related to climate change was at an early stage. Governments of all three countries had ratified the Kyoto protocol and created a designated authority for the CDM. Each of the countries had created a national focal point to the United Nations Framework Convention on Climate Change (UNFCCC) within their respective government environment department. Both DRC and CAR, as low income countries had each developed their National Adaptation Program of Action (NAPA). Cameroon is classified as a middle income country.

With the international discussions surrounding the inclusion of REDD+ in a post-Kyoto agreement, all three countries submitted their Readiness Planning Idea Notes (R-PIN) to the World Bank and were accepted to be part of the program of the Forest Carbon Partnership Facility (FCPF). DRC had its Readiness Preparation Plan (R-PP) approved in March 2010 by the FCPF and the Readiness Grant is in preparation. DRC was also selected as a Forest Investment Program pilot country (Forest Carbon Partnership Facility, 2010b; Ministry of Environment Conservation of Nature and Tourism Democratic Republic of Congo, 2010). It is also the only one of the three research countries which is a pilot country in the UN-REDD program (UN-REDD Programme, 2010). Neither Cameroon or CAR has yet reached the stage of the R-PP (Forest Carbon Partnership Facility, 2010a). All three countries were engaged in a process of harmonization of sustainable forest management practices in the region through the Congo Basin Forest Commission (COMIFAC).

In all three countries most actions related to climate change could be considered as actions to mitigate climate change, particularly those related to reforestation efforts, development of clean energy projects or REDD+. In DRC, given the vastness of its forest the focus of all institutions appeared to be exclusively on mitigation, particularly related to implementation of REDD+ with its potential benefits. While REDD+ was a preoccupation for all institutions in CAR, there were some institutions that were already becoming involved in actions to help the population to adapt to climate change. The government had planned a public awareness campaign concerning climate change in the rural areas. NGOs had climate change as a priority due to its importance for the environment and the local communities that they work with. Following the recent floods in Bangui and the global discussions on climate change, the local Red Cross made climate change adaptation a priority for their action plan from 2010-2014. Environmental NGOs have been involved in discussions as part of the association of NGOs to inform civil society about REDD+ and some are developing REDD+ projects.

In Cameroon, a national observatory has been launched which will provide ongoing monitoring of climate data. The Ministry of Forests and Wildlife (MINFOF) and its associated parastatal, the National Agency for Forest Development (ANAFORE), responsible for reforestation efforts in the country, had embarked on some tree planting projects in northern Cameroon. Some NGOs interviewed have already made climate change a priority for their work in Cameroon. For example, The World Conservation Union (IUCN) has climate change as a strategic priority for their plan of work from 2009 – 2012 with a focus on building knowledge
around the issue and investigating alternative sources of energy that will have less of an impact on the global climate.

Respondents from the forestry companies noted that climate change might be affecting their harvesting operations, but they did not see it as an immediate priority in the overall operations of their companies. However they were aware that it might play a larger role in the future, particularly as a result of international policies such as REDD+, the CDM and the voluntary carbon market. In Cameroon, the companies interviewed had been certified, or were in the process of becoming certified, as practitioners of sustainable forest management, which they said was a result of pressure from their European customers. Therefore, they felt similar pressure regarding climate change would result in it becoming more of a priority for their companies in the future.

3.3 Institutional networks

Inter-institutional activity on the issue of climate change was limited but appeared to be most closely related to the development of two strategic documents related to climate change, namely the NAPA and the R-PIN. In all three countries these processes brought together a variety of stakeholders from different government departments, international organizations, the private sector and civil society. However, there was little indication that this represented evidence of on-going regular contact between the different institutions on the issue. Furthermore, there appeared to be limited interaction within or between various institutional groups in general (Figures, 2, 3, 4).

Inter-departmental government activity in Cameroon on the issue of climate appeared to be limited, although there was some indication that inter-departmental discussions were occasionally taking place. Some NGOs, felt that government departments were beginning to communicate on the issue of climate change and others felt that climate change was not being integrated into the work of government departments. NGOs commented that government departments had limited collaboration in their work, in general. As evidence they cited the granting of mining exploration permits in protected areas and land already designated for other uses such as logging concessions. The overlap of logging concessions with mining explorations was cited as a problem by several forestry companies as well. This situation reveals a weak coordination among government departments. Therefore, while there may be some institutional links at the national scale on climate change, there was no indication of any linkages with lower levels of government or communities.

In DRC a national commission on climate change with representation from various departments and the President’s office is in place but it is not clear how often they meet to discuss the issues. However, not all departments are a part of this forum. It is notable that the Ministry of Gender, Family and Children did not seem to be a member. However, overall NGOs felt that links between different government departments on climate change were quite weak. In CAR it appeared that the collaboration between government departments did not begin with the preparation of the NAPA. For example, the meteorology department and the agriculture department had a history of working together. In the past they were part of a multidisciplinary group that worked on providing infrastructure for measuring climate variables relevant to the
agricultural sector and were a key part of the multidisciplinary team which did consultations at
the local level in the development of the NAPA. Since this work had been affected by the civil
war in CAR, the interaction between government departments did not appear to happen on an
ongoing basis.

Questions were also posed to elucidate the linkages between government institutions and
NGOs. Some of the larger international NGOs, such as IUCN, Wildlife Conservation Society
(WCS) or the World Wide Fund for Nature (WWF), work closely with government, in some
cases to strengthen capacity in the area of biodiversity conservation and more recently in the area
of climate change. In Cameroon, some NGOs felt that they had more contact with government
institutions than the government institutions did with each other. International organizations,
such as the Food and Agricultural Organization (FAO) and the United Nations Development
Program (UNDP) work closely with government in all countries. In some cases, representatives
of large international organizations, such as the French Cooperation, are embedded within
national forestry or environment departments.

Most national NGOs in Cameroon, felt that they had few links with government in any
area and were not currently part of any discussion on issues of climate change. The situation was
similar in CAR where results showed that the interaction of most local NGOs with the
government was limited on any issue, including climate change. However, both development of
the NAPA and the increasing interest in REDD+ has provided an opportunity for more civil
society and government interaction. Civil society respondents also said that their institutional
linkages with the government and the forestry industry were enhanced through the Forest Law
Enforcement, Governance and Trade (FLEGT) process supported by the European Union.

In DRC, the creation of the national coordination office for REDD+ in May 2009,
provided an important focal point for all the interventions and activities by various national
institutions and international partners. The national REDD+ committee is made up of seven
government representatives, four representatives from civil society, one university scientist, a
forestry company representative, and a representative from the President’s office. The REDD+
process also requires that an inter-ministerial committee be formed which will bring together
those departments that are concerned with land use such as Ministry of Agriculture, Fishing and
Animal Husbandry and the Ministry of Rural Development. The REDD+ coordination office
said that the process is designed to be very participatory in nature, and so they work closely with
civil society groups on the issues which provides them with a link with local communities.
Three day workshops were held to explain REDD+ in some provinces which brought together
local government authorities, NGOs, the church and representatives of local communities. The
object of these workshops was to provide information so that it could be shared with others.
Unfortunately limitations of time and money have prevented them from holding these workshops
in each province. While the REDD+ process in DRC was increasing the linkages with the local
level, for the most part in all countries the government linkages with local communities were not
well developed. Actors in civil society, international and national NGOs both have close
linkages with communities in carrying out their work. The private forestry companies also work
in communities by carrying out social service initiatives such as building health clinics.
Figure 2: Current inter-institutional linkages on climate change in CAR.

Figure 3: Current inter-institutional linkages on climate change in DRC.
4. Discussion

4.1 Perceptions and Priorities

The fact that there is general awareness of climate change among the various institutional representatives is an opportunity for formulating a response. Since many said that they are already noticing some changes that may be explained by global climate change, this may influence decisions that are made in their respective institutions related to climate change. It is also important that many stated that the poor would be most affected by any environmental or policy change. However, how any of these perceptions would be translated into policy was not evident. While representatives of government and civil society institutions stated that climate change was a priority, any concrete response was clearly at an early stage for all institutions in all three countries, as it is in many countries globally (Intergovernmental Panel on Climate Change (IPCC), 2007a; Koch et al., 2007; Orindi and Murray, 2005). This may be a result of other pressing development issues of poverty reduction, sustainable development, education and economic growth or fiscal constraints. Adger et al (2003) conclude that in an African context, most countries’ priorities relate to poverty reduction and development and not to the risk of long-term climate change, although such issues cannot be divorced from one another.

The recent emphasis on the role of the Congo Basin Forests in mitigation of climate change through REDD+ appears to have become a major driver in building awareness of climate change. This was particularly true for government and civil society institutions as they are interested in the opportunities presented by REDD+, and also concerned about its challenges in terms of implementation. While preparation for REDD+ was most advanced in DRC, in general, action to take advantage of these opportunities or address apparent challenges is still at an early
stage. This is not surprising given the human, technical and infrastructure challenges in each of the three countries. REDD+ as a policy is also still evolving at the international level. Given the global significance of the Congo Basin forest, REDD+ can be expected to dominate the discourse on climate change in the Congo Basin region in the near future.

4.2 Enhancing adaptive capacity

Similarly to other parts of Africa, the Congo Basin countries are considered to have a high level of social vulnerability to the direct effects of climate change due to many factors, such as level of poverty and the level of corruption (Adger and Vincent, 2005; Intergovernmental Panel on Climate Change (IPCC), 2007b). As post-conflict developing countries with a history of poor governance, both CAR and DRC have specific challenges in enhancing their capacity to adapt to climate change. While both countries have suffered from a lack of investment in infrastructure historically, much of the infrastructure that did exist has been destroyed by the recent civil conflict. Communication and travel within the countries is made more difficult due to the lack of infrastructure and continuing instability in some areas. The educational system of both countries is poor, due to lack of historic investment and most recently due to the political instability. This has led to a crisis in human capital at all levels. While there had been some international investment in sustainable development initiatives prior to and during the conflict, these initiatives have suffered due to the instability created by the conflict which has not completely ended in some areas of both countries.

Both CAR and DRC face enormous, complex challenges to their national development. Weak governance and corruption are also key limitations to the capacity of both countries to adapt to climate change. According to Smit and Pilifosova (2003) the lack of key determinants of adaptive capacity, such as economic wealth, technology, information, skills and infrastructure, increase the vulnerability of nations and communities to the various challenges of climate change. The lack of these key determinants of adaptive capacity limits both countries’ ability to reduce vulnerability to climate change and take advantage of opportunities. However, it was evident that there was a significant amount of international aid in both countries which is beginning to address some of the challenges. While the situation in Cameroon is somewhat better since it has not had a history of armed conflict, it still faces deficits of the human, technical and physical capacity required to respond to the challenges of climate change or the opportunities presented by REDD+.

As identified earlier, the existence of institutions and strong networks that learn and store knowledge and experience, and plan for changing environmental and policy conditions and risks enhance adaptive capacity (Tompkins and Adger, 2004). Good inter-sectoral coordination is also important since policies in other sectors such as agriculture, transportation and resource development will have significant impacts on forests (Seppälä et al., 2009). Furthermore, the recent integration of diverse actors in global forest governance has enhanced sustainable forest management (Agrawal et al., 2008; Visseren-Hamakers and Glasbergen, 2007). Therefore, it is of concern that results show that while some inter-institutional links have been created in the process of the development of policy documents related to climate change or REDD+, there appeared to be little ongoing collaboration. The lack of strong institutional linkages on climate change have also been noted in other African countries (Koch et al., 2007; Orindi and Murray,
However, development and implementation of REDD+ agreements requires the ongoing collaboration of different departments and so the interaction may increase.

The limited linkages with different levels of government and local communities regarding climate change constrains adaptive capacity and could increase the vulnerability of local populations (Smit and Wandel, 2006). However, the linkages of international organizations and international NGOs and some national NGOs, particularly in DRC, with the government are playing an important role in enhancing the capacity of the countries to respond. Additionally, the regional connection of Congo Basin countries through COMIFAC provides a network for sharing of resources and knowledge to coordinate a response to new policies like REDD+.

It has been shown that well-connected networks enhance communication, favour collaboration, build social capital and foster innovation which is essential in dealing with an issue such as climate change (Carlsson and Sandstrom, 2008). Therefore, it is essential that networks of stakeholders in government, civil society and the private sector be strengthened in order to increase overall adaptive capacity. However, it is also critical that government institutions engage with the local population whose livelihoods are most at risk from changing environmental and policy conditions. Such engagement will increase adaptive capacity as it will provide opportunity for sharing of knowledge and concerns and build social capital (Pahl-Wostl, 2009; Tompkins and Adger, 2004; Walker et al., 2006). This may be most effectively done through international and national NGOs who already have close relations in working with communities. NGOs already play a key role in linking with communities in decentralized forest management (Brown et al., 2008).

Since local NGOs are sometimes limited in their knowledge of climate change, this reality requires that capacity be built in these local NGOs on issues relevant to climate change. While some important efforts have been made to engage indigenous communities these linkages need to be strengthened. Since forest communities and indigenous peoples are typically marginalized in decision-making in all three countries, it is important to build capacity in understanding their rights so that they can have an effective voice in the process. Given that women are key stakeholders in forest harvesting and agriculture, their participation needs to be fostered. Fostering the engagement of women will likely enhance adaptive capacity as women play important roles as stewards and managers of forest resources and are powerful agents of change in their communities (Brown et al., 2008; Brown et al., 2007; Gurung and Quesada, 2009).

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