

Country papers: Preparation of National Communications from Non-Annex I Parties to the UNFCCC

A Compilation of Lessons Learned and Experiences from selected countries

11/27/2012

National Communication Support Programme (NCSP)

Acronyms

BURs	Biennial Update Reports
CDM	Clean Development Mechanism
CGE	Consultative Group of Experts on National Communications from Parties not Included in Annex I to the Convention
CTNCVC	National Technical Commission on Climate Variability and Change
COP	Conference of Parties
CSO	Civil Society Organisation
ENVSEC	Environment and Security Initiative
FNC	Fourth National Communication
GEF	Global Environment Facility
GHG	Greenhouse Gas
INC	Initial National Communication
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
LECRDS	Low-emission, Climate-resilient Development Strategies
LULUCF	Land-use, Land-use change and Forestry
MDG	Millennium Development Goal
NAMA	Nationally Appropriate Mitigation Action
NAPA	National Adaptation Programmes of Action
NC	National Communication
NCCC	National Climate Change Committee
NCCCT	National Climate Change Country Team
NCSP	National Communication Support Programme
NGO	Non-governmental Organisation
NTCs	National Technical Committees
PAGE	Programme for Accelerated Growth and Employment
PICCAP	Pacific Islands Climate Change Assistance Program
PMU	Project Management Unit
PNEDD	National Plan for the Environment for Sustainable Development
SE/CNEDD	Executive Secretariat of the National Council of Environment for Sustainable Development
SNC	Second National Communication
TNA	Technology Needs Assessment
TNC	Third National Communication
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
V&A	Vulnerability and Adaptation
WB	World Bank

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Introduction

Since March of 1997, when the first National Communication (NC) report was submitted to the United Nations Framework Convention on Climate Change (UNFCCC), countries are striving to prepare and complete their NC Reports in order to comply with their obligation under the UNFCCC. Countries have witnessed a substantial technical improvement regarding the main issues to be reported and analysed in their NCs.

Countries that participated in the NCSP workshop on Lessons Learned from the National Communications (Istanbul, Turkey, 2-4 October 2012) have prepared brief papers on their experiences during the NC implementation. The papers, which are compiled in this publication, provide very useful information regarding the NC processes and outcomes. Most of them highlight the main outcomes of the NCs and at the same time try to highlight the main challenges faced during the NC preparation. Although there are many common issues, the papers also highlight different experiences, challenges and lessons learned. The way many of these challenges have been addressed shows the great initiatives the countries have developed during the NC process, ranging from establishing a network of stakeholders, to designing new ways to fill data gaps or assess climate change impacts on biodiversity.

The NC process have brought together professionals from different agencies and institutions working on climate change and have established new institutional networks that could facilitate the exchange of information for the preparation of future NCs and more broadly for climate change studies. The experiences range widely among countries, from carrying out preliminary vulnerability assessments and mitigation analysis to countries that have used their NCs for designing national adaptation strategies and mitigation action plans.

Many important issues are still to be addressed in the future, for example the need to involve a wider group of stakeholders in the NC preparation, as a way to ensure broader ownership and impacts. This ownership would, for instance, assist countries strengthen their legislation to achieve a sustainable and green development or include climate risk issues into the national development plans.

Data gaps also remain a challenge while some other countries will need to further strengthen their capacity for and through the National Communication process. Some countries have mastered complex analysis, including the use of more advanced methodologies for GHG inventories, V&A assessments and mitigation analysis, the compilation and management of the required data, and the use of their National Communications as a tool to integrate climate change into national planning.

With the view of future reporting requirements namely Biennial Update Reports countries also are taking extra steps to institutionalize climate change relevant information, and data collection, analysis and management. Most countries have also taking further steps to maintain a stable and knowledgeable team to ensure a sustainable and more efficient reporting process. The papers included in this publication show that while national circumstances and priorities differ, a large amount of valuable experiences has been generated and most countries are taking extra steps to ensure that their national teams have the capacity to face new reporting schemes.

Experiences from the preparation of National Communications

These experiences and best practices are manifold and include information on the preparation of nationally tailored guidelines for the preparation of GHG inventories, mitigation analysis, or V&A assessments, and lessons on how to overcome data sharing constraints among institutions by creating Memorandums of Understanding between institutions to regulate the further use of information.

In general, most countries are moving from a project-approach based on external consultants towards a more process-oriented-approach, where a permanent multi-disciplinary national team has been established or will be established to prepare the NCs. Some of the papers highlight the lesson learned from this experience. They also show how some countries anchor these teams at high-level positions within the government. This has allowed the NC studies and outcomes to be used as tools for integrating the issue of climate change into sustainable development programs. The papers also depict how inter-generational working teams or train-the-trainers approaches are increasingly being employed to maintain and expand the level of expertise present in some of the countries.

Objective of the publication

The main objective of this publication is to highlight the lessons learned and good practices from the sources. Each one of the papers presented in this publication narrates in their own style the countries' experiences, as summarized by the authors.

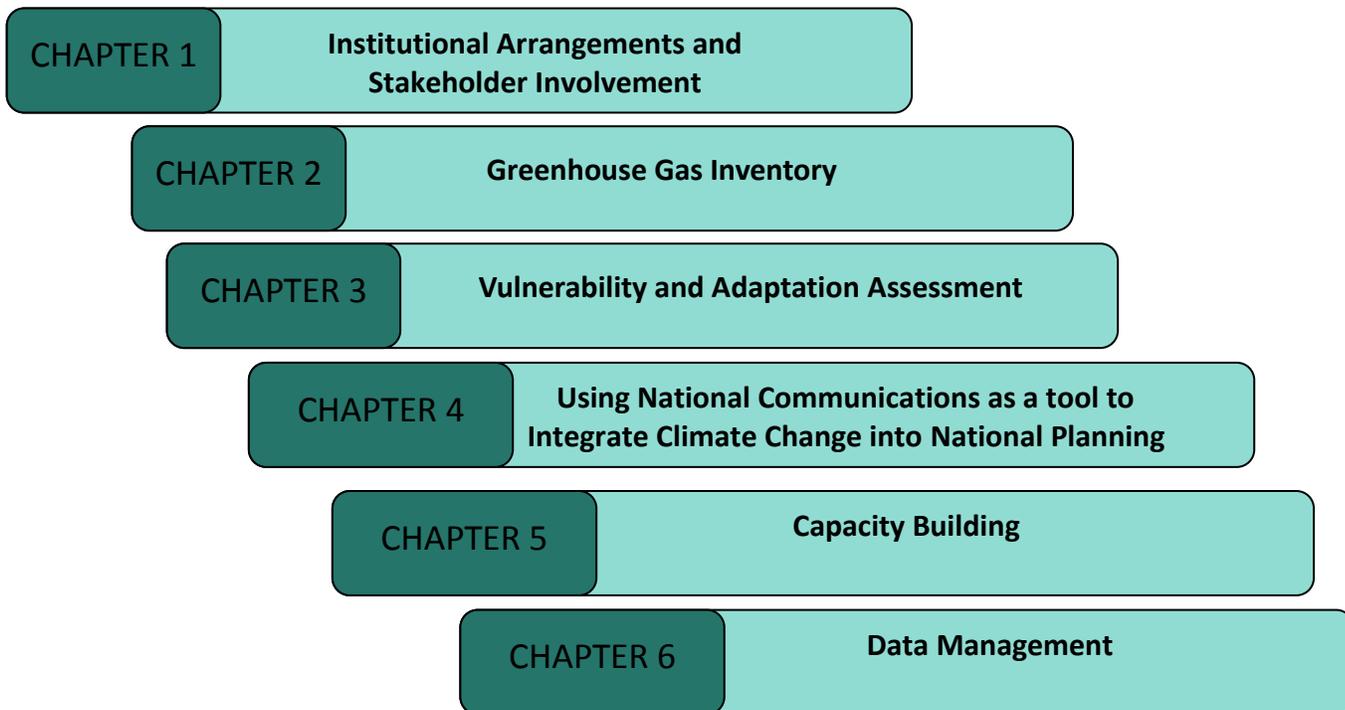
The National Communications Support Programme (NCSP) has compiled these brief papers into this report as a way to disseminate countries' efforts to share their challenges, success stories, and lessons learned that can provide useful examples to other countries. We believe that many countries could use the publication to compare their experiences and to see that while their experiences may be quite similar, the approach to solve the challenges can be rather different. Furthermore, these similarities and differences could be very useful for mapping or designing new strategies within the context of preparing the next NCs.

The papers have been grouped thematically and represent first-hand experience from National Communication project coordinators of 29 countries. In addition, a NCSP publication is available synthesizing experiences from NCs based on interviews, surveys and background documents, as well as the workshop documentation including a synthesis of presentations and panel discussions from the lesson learned workshop in held in Istanbul, Turkey. The NCSP document can be downloaded from the following website: <http://ncsp.undp.org/event-workshop/ncsp-final-workshop-lessons-learned-national-communications>

The NCSP would like to acknowledge the great efforts made by the authors of these brief papers, which provide valuable contributions from 29 countries to the knowledge sharing and dissemination of information relevant to the NC preparation. Our sincere appreciation for their contribution to this publication.

Country Papers

In order to provide a better understanding of the experiences and lessons learned from the National Communications, the papers have been categorized into six different themes



Papers included in this section stress the importance of NCs in facilitating the consultative process and establishing networks among different stakeholders. Some of the experiences depicted here show that a wider arrangement of stakeholders and their proactive participation has permitted them to get political support at higher levels.

The papers also highlight that enhancing capacity of the stakeholders at all levels has enabled a consultative process and facilitated dialogue between experts and decision makers through effective communication and also by providing capacity building. By establishing these kinds of networks the NC teams were allowed access to different sources of data that could not previously be accessed and that are very crucial for the preparation of the NC report.

The papers have also underlined that in order to assist all partners in fully understanding and taking ownership of the process, it is crucial to discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and developing conflict resolution mechanisms.

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The following countries are depicted in this chapter:

1. **Angola** experience on stakeholder engagement within national communication
2. **Albanian** experience with management arrangements to prepare and sustaining the NC work
3. **Cape Verde** institutional arrangements to prepare and sustain the national communications
4. **Cook Islands:** Institutional arrangements for the Cook Islands through National Communication
5. Experience of the **Islamic Republic of Iran** in National Communications in Institutional Arrangements to Integrate Climate Change in the National Development Plans
6. Experience of the State of **Kuwait** Institutional arrangements: Project management arrangements to prepare and sustain the NC work, stakeholder involvement & coordination, and networking-Capacity building for the national communications process as a whole
7. Institutional Arrangements for National Communication Preparation in **Jordan**
8. **Niger:** Institutional arrangements: how project management prepare and support the work of National Communications, stakeholders involvement, coordination and networking, as well as technical considerations related to GHG inventories
9. **Sudan** National Communications- Institutional Arrangements and Capacity Building

Angola

Experience on Stakeholder Engagement within National Communication Preparation

By: Abias Huongo

Introduction

Angola is a multicultural and multilingual country. Its population is estimated to be 18,082,000 people (INE2010). The demographic density is approximately 13.2 people per km², a low number when compared with the African average, which is 21 people per km². The Angolan population is very young. About 50% is less than 15 years old, while 60% is less than 20 years old. 93% of the population is under 50 years old.

The war for independence, followed by a civil war which lasted until 2002, had severe repercussions on the demographic structure of the country, since a large portion of the population was forced to leave their place of origin and migrate en masse to the urban areas, where they might find some degree of protection and security, as well as food donations. This had a great impact on the population distribution over the territory and its management. It is estimated that over half of the Angolan population now lives in urban centres, while maintaining rural living habits.

The Angolan economy is characterized by high levels of growth, but also by an essential dependence on the oil sector, which represents 55% of the GDP and 95% of all exports. Despite this dependence, the country registers a remarkable macroeconomic stability, which is reflected in the stability of the national currency.

The National Communication Process

Angola has participated in the climate change process for quite some time now, but the country has encountered some limitations in terms of full participation in the overall process.

Many attendants at the meetings only came because they thought they would be compensated and not for the opportunity to learn. Having so few people come because of their interest in learning makes it difficult for the country to gain knowledge in the field of climate change.

Starting the National Communication process was difficult, because there was a very limited technical and human capacity to undertake the technical studies, and to understand different models and methodologies.

The Angola INC was initiated in March 2009 but only after the inception workshop and training that took place in May did the team really understand the magnitude needed to complete the report.

Discovering the road ahead: After looking at the project document, it was clear that training of national consultants from different institutions was essential to undertake the National Communication; a short assessment made at the beginning of the project showed the need to prioritize the training activities in focal areas like adaptation model usage and mitigation and Green House Gas Inventory process.

Experiences from the NC Process

Networking and south-south cooperation: Exchange of knowledge between developing countries (or in this case countries that did not yet complete their NC reports) presents challenges and opportunities, but the experiences of these countries can help us to understand

the context, magnitude and importance of NC, and the need to focus and continuously improve the context of studies.

South-south cooperation also provided us with an opportunity to work with Brazil in training National Consultants, and also gave us a forum to exchange experiences because of our common language. We also exchanged experiences with Cuba regarding lessons and methodologies used in their NC process, as well as with Namibia and Mozambique in terms of approaches used in overall process of NC.

Stakeholder involvement:

Involving other institutions in National Communication Process

This experience was obtained by participating in different workshops and training opportunities, learning from other experiences, and trying to apply those experiences in National context.

Interaction with other stakeholder has allowed us to build institutional partnerships within Government institutions (Petroleum, Industry, Agriculture, Education, ETC), private sector institutions (Chevron, BP, Ecovisão, etc), and civil society (Maiombe Network) according to the work of each respective organization.

The frequent dialog in terms of data acquisition and management and the need to improve existing data was a key element to all these process.

A project steering committee was established that met regularly four times per year, while at the same time the project used the Interministerial Commission on Environment for monthly meetings. Bilateral meetings with other institutions to advance in specific interest/topics were also held when needed.

Revising the technical outcomes of the National Communication

Sending our NC report to the NCSP help us in two ways: it improved the written report in terms of grammar, presentation, flow and relevance; secondly, it allowed us to evaluate the level of uncertainty of the information generated by the different consultants and helped us build up our capacities for preparing the final reports.

Access to guidelines and training material

Using material produced by National Communication Support Program

The information produced by the NCSP helped us by allowing us to adjust the countries general information to meet specific needs of National Communication reporting. At the same time it provided some guidance as to the level of information required in the final report, as well as showing us how local institutions need to be organized for the subsequent National Communications.

Training opportunities

All the consultants that have participated in specific training opportunities came home with ideas and a need of involving other people from different institutions in the elaboration of National Communication, because of its complexity.

The use of climate change models to produce scenarios for adaptation and mitigation is also one example of a learning opportunity and the involvement of different institutions, considering the complexity of using those models.

For the National Communication, we have participated in training sessions organized by NCSP on mitigation and Adaption, and other trainings on adaptation, mitigation and greenhouse gases organized in Angola by INC, with participation of trainers/experts from Brazil and Portugal.

Conclusion

The National Communication Support Program helped us to understand the need for integration of climate change considerations into different institutions. It also helped us to sustain the process of elaboration of National Communication.

Obtaining NCSP support contributed to the improvement of the human capacity required to complete the NC process and initiated the creation of institutionalization of expertise in different sectors and people.

The involvement of different institutions in the NC process is a key element in obtaining good and credible results within the process of reporting.

Training is a key element; to maximize the benefit of each session, it was important to involve more than one participant.

NC is a learning process. To improve this process there is a need to have different institutions become more engaged and committed. This may mean allocating time, people and resources to develop subsequent National Communication Components.

The involvement of different institutions contributes to improve the capacity of the country dealing with National Communication.

Albania

Experience with Management Arrangements to Prepare and Sustain the NC Work

By: Mirela Kamberi, M.Sc. – Team Leader/Projects Coordinator, UNDP Climate Change Programme

Introduction

Since transitioning from a centralized to market economy in 1992, Albania has implemented an ambitious set of reforms that have yielded significant results in macro-economic stability. The country has enjoyed consistent and sustained economic improvement over the last ten years and unemployment is in steady decline. As a result, Albania has one of the highest rates of poverty reduction in the European and Central Asia region. Today, Albania is one of the fastest growing countries in Europe and a potential candidate for acceptance to the European Union (EU).

As a non-Annex I Party to the UNFCCC, Albania is eligible for expedited financing for the preparation of its National Communications (NC) to the UNFCCC. The GEF/UNDP Enabling Activity project enabled Albania to prepare its Initial National Communication (INC), which was submitted to the UNFCCC in July 2002. The core focus of the INC was the preparation of a GHG emissions inventory, It also considered seven main GHG-emitting sectors: (i) energy, (ii) industrial processes (iii) agriculture and livestock, (iv) land use change and forestry (LUCF); (v) waste; (vi) solvents; and (vii) international bunkers. The inventory was the basis for the GHG mitigation analysis, which projected GHG emissions for each year up to the end of 2020. The INC also provided a vulnerability and adaptation assessment that addressed vulnerability in all relevant sectors throughout Albania. When assessing vulnerability, three time horizons were considered: 2025, 2050 and 2100. The INC provided a list of adaptation options up through 2025.

The SNC built off the results of the INC and the 2004 Technology Needs Assessment (TNA). The TNA identified technology transfer needs for climate change mitigation and adaptation. The SNC extended the inventory of anthropogenic GHG emissions and removals to the period 1990-2000, using 2000 as its base year. The SNC considered six main GHG-emitting sectors: i) energy, ii)

industrial processes, iii) agriculture, iv) waste, v) LUCF, and vi) solvent and other product uses. Overall uncertainty in the second GHG inventory was much less than for the INC, though data gaps remained in certain categories, particularly fuel wood consumption. The inventory was the basis for the GHG mitigation analysis, which was extended to 2025 and had a pronounced focus on energy and transport (the main emitting sectors). The vulnerability and adaptation assessment of the SNC was more focused than the broad assessment able to be performed in the INC. The SNC assessment of vulnerability and adaptation options focused on the Drini River Cascade (area from Kukës up to the Lezha Plain). When assessing vulnerability, three time horizons were considered: 2025, 2050 and 2100. The SNC provided a list of adaptation options up through 2025.

Albania has started the process for the preparation of the Third National Communication to UNFCCC (June, 2012). The major objectives are to update the annual Albanian Inventory of Anthropogenic GHGs to the period 2000-2005, focusing on the sectors/gases that have a significant share of GHG emissions such as the transport sector; downscaled global models will be developed to regionalize climatic forecasts and apply these new forecasts in V&A assessments that are focused on the entire coastal region; state-of-the-art GHG mitigation modelling frameworks will be used to develop a national low carbon development strategy. Albania's description of national circumstances will be updated, as will the envisaged steps necessary to implement the Convention. Finally, the project will continue to build institutional capacity for implementing the Convention in Albania including undertaking activities related to climate change education and awareness.

In the overall, the Government of Albania has considered the preparation of NCs as a highly valuable exercise and has put substantial resources and efforts into past Communications. Many institutions and specialists have been trained and institutional capacity has been built and sustained. To ensure country ownership, the design of the NC projects integrated extensive stakeholder consultations during the respective stocktaking exercises and during their implementation processes to ensure that goals and objectives were consistent with national sustainable development priorities. In line with the findings of the National Communications, climate change was addressed into other policy papers - sectorial strategies like: the National Energy Strategy - 2003; the Environmental Cross-cutting Strategy 2007-2013; the National Strategy for Development and Integration (NSDI) 2007-2013; the Albanian Policy Paper and its related Action Plan for Carbon Finance - 2009; the Albanian Adaptation Health Strategy – 2011; the Action Plan for Reducing Vulnerability to Climate Change in Albanian Agricultural Systems, etc. New resources have been mobilized in some of the following priority areas/technologies: the Carbon financing project; Albanian Program on Solar Water Heating Market Transformation; Identification and implementation of Adaptation Response Measures in the Drini –Mati River Deltas; public awareness related projects, etc.

Challenges

Due to Albania's pressing social and developmental needs, resources for climate change related activities are still scarce. And furthermore, ensuring the sustainability of the NC process remains a challenge mainly due to the lack of:

- (i) A permanent coordinating body on the climate change issues;
- (ii) Specific legislation to address the basis for climate change issues, which lack brings difficulties regarding concrete institutional support/inputs to the NC preparation by a diverse set of economic sectors; and
- (iii) Qualified personnel within public institutions to undertake analysis related to the preparation of NC.

Lessons learnt from the NC process

The Ministry of Environment, Forestry, and Water Administration is the National Body responsible for the national environmental policy and as National Focal Point for the United Nations Framework Convention on Climate Change (UNFCCC), and has served as the National Executing Agency for the preparation of the national communications. The Ministry has been placed in charge to facilitate the coordination of project activities with other government institutions and decision makers, including some of the more important ones like: the Ministry of Economy, Trade and Energy, the Ministry of Agriculture and Food, the Ministry of Public Works and Transport, the Ministry of Health, the Ministry of Tourism, the Ministry of Integration, INSTAT, the Academia and the University institutions, the General Directory of Civil Emergencies, interested NGOs. The UNDP Climate Change Programme in Albania has operated as the principal country level liaison with the government and private sector participants, ensuring effectiveness and cost-efficiency. UNDP-GEF NCSP was closely linked so as to have technical/administrative assistance on hand when required. Technical assistance was also provided by the UNFCCC Secretariat, mainly through workshops and trainings.

Challenges and steps taken to address the challenges

- i. The lack of a permanent coordinating body regarding climate change issues:
A Steering Committee was established for every individual INC, SNC and TNC project, but continuity has been hindered. During the TNC process, efforts have been started to establish the Inter-ministerial Committee on Climate Change. This would be headed by the Deputy Minister of Environment at the political level, and supported by the nominated technical focal points in each and every related institution in order to avoid delays with the stakeholders coordinating from a diverse set of economic sectors.
- ii. The lack of specific legislation to address the basis for climate change issues with a special focus on future updates to the GHG inventory.
A drafted legal document is provided so as to be able to overcome the aforementioned barrier: care is shown to integrate this as part of the efforts Albania is doing to harmonize its environmental legislation with the EU one.
- iii. Potential lack of technical qualified personnel: There has been a critical mass of institutional capacity developed through the process of preparation of national communications. However, up till now the NC preparation has been secured through individual personnel hired by each respective project: these individuals are coming mainly from academic institutions and have been put through several trainings on different technical topics. In order to maintain capacity built in previous national communication processes, such as national GHG inventory & mitigation and the vulnerability & adaptation, we have kept intact the core members of the respective teams for each of the groups described above, while at the same time expanding the group size. This institutional memory maintains familiarity with the limitations, obstacles, and challenges associated with the NC development. The detailed experience with past efforts will also help to ensure coherence, continuity, stakeholder participation, and the exploitation of pertinent synergies.
- iv. The establishment of processes that allow consultations with a broad range of stakeholders' at all stages: stock-taking, inception and implementation:
 - a. Stock-taking process will help the stakeholders:
 - o Understand climate change and environment issues and trends occurring in the country

- Strengthen stakeholders' capacity on climate change and environment issues
- Increase data availability and access issues.
- Understanding of the preferred geographical and sectoral focus
- b. Inception process is crucial in helping all partners to fully understand and take ownership of the process. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and will establish conflict resolution mechanisms.
- c. Implementation: Consultations during implementation will produce sound and accepted results. Not only will broad stakeholder involvement promote appropriate policy proposals, it will also generate improved knowledge, methodologies, and human and institutional capacities that are necessary for the continued success of the NC process.
- v. Sustainability, the Government of Albania considers the preparation of NCs as a critical part of its efforts to cope with the impact of climate change. However, resources for NC activities are scarce due to Albania's pressing social and development needs. Therefore, UNDP/GEF support is critical for the sustainability of the NC process.

The national communication process in Albania has been extremely important in mainstreaming and integrating NC findings into other developmental, sectoral strategies/policies. Yet, it has been the main document/source for mobilizing other funds/projects in the area of climate change.

Conclusion

The national communication process in Albania has been extremely important in mainstreaming and integrating NC findings into other developmental, sectoral strategies/policies. Yet, it has been the main document/source for mobilizing other funds/projects in the area of climate change.

In an environment of scarce resources, UNDP/GEF support is critical for the sustainability of the NC process. The support from the NCSP has also played an important role.

With regards to replicability, this could get ensured only by broad stakeholder involvement throughout the NC project. The capacity building through training sessions on selected topics helps a lot with the whole process from its conceptualization up to the production of the reports and in the between period from one NC to the other. And yet, in the circumstances of lack of in-house technical experts, the development of regional networks to facilitate information and data exchange is of high interest.

Albania will take care to profit from any positive experience with the process of national communications once preparing its Third National Communication to UNFCCC, which key expected outputs are the following:

1. GHG Inventory for energy, industry, agriculture, land use/forestry, and waste for 2000-2005; transport refinement
2. Regional climate change modeling using dynamic downscaling techniques
3. Vulnerability assessment focused on coastal zones for key sectors (i.e., agriculture, water resources, tourism, biodiversity)
4. Adaptation action plan within integrated coastal zone management framework
5. GHG mitigation focusing on transport and industry
6. Low carbon development action plan within stakeholder-driven process.

Cape Verde

Institutional Arrangements to Prepare and Sustain the National Communications

By : Francisco da Veiga Correia

Introduction

Under the context of climate change and sustainable development, the Republic of Cape Verde has ratified the UN Framework Convention on Climate Change (UNFCCC) on 29 March 1995, and it entered into force on 22 June of that year. In addition the country ratified the Kyoto Protocol on December 5, 2005. As a Contracting Party to the Convention, with common yet differentiated principles, Cape Verde has committed to prepare a National Communication to the Conference of Parties. In 2000 Cape Verde submitted its Initial National Communication and its National Strategy and Action Plan on Climate Change. Cape Verde also submitted its NAPA in December 2007 and its Second National Communication in October 2011.

The process of implementing the National Communications (1st and 2nd) enabled the country to create new institutional arrangements and build technical capacities based on an organized system that better understands the issues of climate change and allows the country to also respond to the UNFCCC commitments.

The preparation of the national communications reports was led by the National Institute of Meteorology and Geophysics, the agency responsible for Climate Change issues at national level, and it is supported by the General Directorate of Environment, institution responsible for monitoring all the actions in the framework of the project related with the environment.

The national communication process included a wide range of stakeholders from local and national institutions from various thematic teams. The main objective is to contribute and promote the integration of Climate Change issues into national planning in order to promote sustainability of the planet and of Cape Verde.

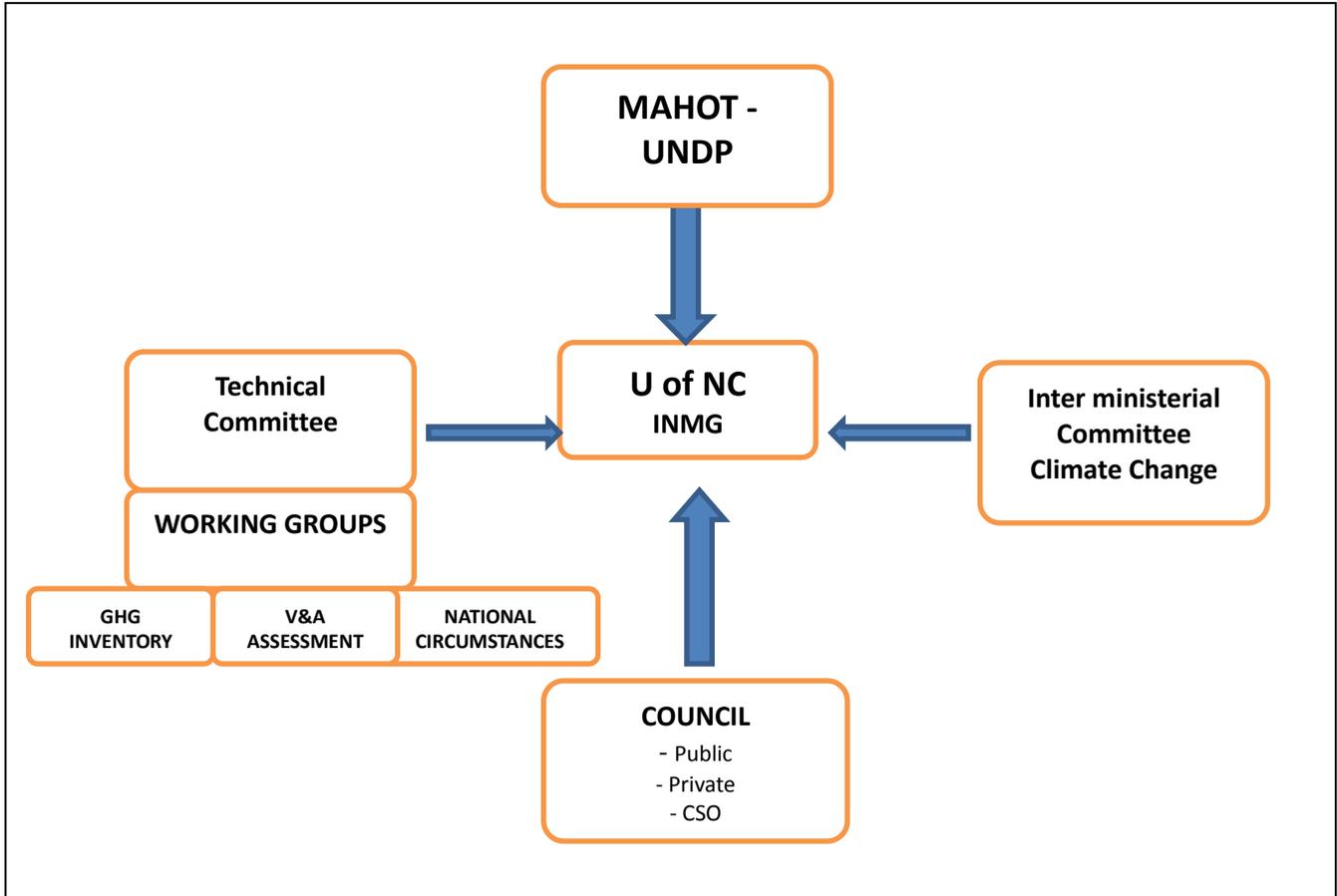
This paper presents in brief the Cape Verde experiences gained during the NC process on the institutional arrangements in order to better address the issues of climate change. Also presents some lessons learnt.

Experience highlighting the main lessons of the NC process and the main challenges

The preparation and implementation of Cape Verde Initial and Second National Communication project provided some lessons and best practices that could enhance the design and implementation of others projects related to Climate Change issue, some of the lessons learned and challenges are highlighted below.

- Involvement of decision makers is critical to consolidate the NC preparation on a continuous basis and to secure long term institutional engagement at all levels. The institutional framework could ensure data sharing at national, local and government and private sector level
 - Conduct the NC process using participatory and highly informative approaches;
 - Capacity development (institutional and human resources) is critical for the sustainability of future interventions.
1. The great involvement of institutions, stakeholders and NGOs (Ministry, Government Institutions, Research institutions, Universities, Private sector, Civil Society Organizations, Public, Municipalities) has contributing to promote the high level awareness on the Climate Change issues and its impacts and also assessed the climate vulnerabilities of Cape Verde, a small island state. Based on the NC implementation it is envisaged that future

Communications project will have the implementation arrangements structured as illustrated in the figure below.



2. Experience has shown that it is essential to conduct the NC process using a participatory approach, taking into account the perspective of sustainable development and the millennium development goals and the fight against poverty in Cape Verde. For instance, the renewable energy programs were put in place to reduce the country dependency on fossil fuels and ensuring the reduction GHG emissions. In addition environmental programs and plans have been crafted to ensure that environmental conservation creates enabling conditions for achieving the MDG and promote growth and poverty reduction.
3. Capacity development (institutional and human resources) is critical for the sustainability of future interventions. Local scientific and analytical capacities must be enhanced for the monitoring of climate impacts and improve the predictions at regional, national and local level.

The Road ahead based on the lessons learned

Institutional arrangement structure

Constitution of a Technical and Scientific Nucleus:

Taking into account that most GEF funded projects aim at reinforcing the institutional and human capacities, a special attention must be paid to the **Technical and Scientific Nucleus**, made up of national multidisciplinary and multi sectorial teams or work groups, in order to enable them to respond to the engagements and requirements of the Convention and Kyoto Protocol in terms of technical and scientific studies to be carried out in the different sectors and disciplines. In this regards, NC process could develop capacity building action plan for the thematic working groups involved in scientific studies.

Tasks of the Technical and Scientific Nucleus:

1. Preparation of the national strategy for elaboration and implementation of the NC;
2. Elaboration of national technical and scientific studies;
3. Organization of information and data collection activities to be explored in national, regional and/or international workshops and meetings.
4. Determine the composition of the Technical and Scientific Nucleus:
5. Identify and include decision makers or influent members in the process of elaboration and implementation of sectorial policies and strategies in the area of climate changes ;
6. Include experts in the technical and scientific areas, from the strategic sectors related to climate changes (*see constitution of the CNCT-CC*);
7. Identify private sectors: commercial and industrial associations, commercial enterprises, enterprises / industrial groups, civil construction enterprises, petrol/gas societies, societies / energy production and distribution enterprises (conventional and renewable energies);
8. Reinforce technical capacity of Civil Society Organizations that deal with climate change problems. Capacity building is important in order to promote its animation, training and technical assistance potential, creating a dynamics of collaboration and response provision to certain national preoccupations related to the climate change.

Technical and scientific capacities

Since the climate change is an issue of national preoccupation and incorporates a broad range of stakeholders such as national entities, civil society, private sector, teaching and research institutions, it becomes necessary that the technical and scientific capacities of the strategic national and local actors be reinforced. This will allow them to achieve a better comprehension of the climate change phenomena and will also permit to adapt their actions to the climate change related situation and problems.

The recent implementing process of NC was conducted based on one simple structure under the Environmental Ministry. The national lead agency responsible for the oversight and implementation is the National Institute of Meteorology and Geophysics.

A new institutional arrangement is being proposed: the Project Management Unit should continue under the leadership of National Institute of Meteorology and Geophysics (INMG), overseen by the Designated National Authority (DNA) and the Project Steering Committee. In addition a Technical Committee, composed of three thematic working groups (WG I GHG Inventory and Mitigation; WG II Vulnerability Assessment Adaptation; WG III National Circumstances) should be legally created to provide substantive technical inputs to the project. In order to enhance the participatory approach and promote the ownership an Advisory Council is also proposed. This council will integrate stakeholders from the private, public sectors, NGOS and Civil Society Organizations. (See figure 1).

To reinforce this institutional structure, Cape Verde must consolidate the Project Management Unit (PMU) and his technical team to carry out a successful NC process and to ensure the proposed outcomes. However, the PMU and the team should strive to carry out the following actions:

- To carry out in depth country situation analysis to inventory all studies undertaken that is directly or indirectly related to climate changes;
- Ensure a participatory, sectorial and intersectorial approach in phase of NC process;
- To promote an active participation of the grassroots groups

Conclusion

The paper concludes that Cape Verde recognizes the importance of NC, not only as an obligation under UNFCCC, but as a relevant document and process to continue monitoring the country GHG emissions and carbon foot print. We have learnt that the process is very complex and requires a good preparatory phase and also a well-structured institutional setup that will ensure an adequate engagement of all stakeholders and thus facilitating data sharing.

In addition, we have learnt that the NC ought to be institutionalized and capacity building enhanced at all levels and sectors in order for the sectorial analysis to be used for appropriated national mitigation actions and for designing adaptation strategies that respond to Cape Verde's national circumstances.

Cook Islands

Institutional arrangements for National Communications

By: Teresa Miimetua MATAMAKI, National Environment Service, Cook Islands

Introduction

The Cook Islands ratified the United Nations Framework Convention on Climate Change on April 20, 1993 and its Kyoto Protocol on August 27, 2001. The Convention entered into force for the Cooks Islands on 21 March 1994. Subsequently the UNFCCC Kyoto Protocol came into force on February 16, 2005.

Under its obligations the Cook Islands published its Initial National Communication (INC) in 1999 which was undertaken within the regional Pacific Islands Climate Change Assistance Program (PICCAP). The INC described the Cook Islands' high vulnerability to climate change, however its capacity and capability to respond to increasing climate changes was not possible due to resource constraints. The INC commenced the gathering of necessary scientific baseline data related to climate change impacts and Cook Islands GHG emissions, including climate observations. While the challenges and some gaps persist, there have been significant advances in understanding of expected impacts along with adaptation planning and mitigation measures since the 1999 INC.

The Second National Communication (2NC) for the Cook Islands has been supported through the United Nations Development Program (UNDP) and the Global Environment Facility (GEF) and reflects a shift from regional to national programmes. The 2NC builds on the first and updates the Cook Islands national circumstances, vulnerabilities and impacts and reports on advances in adaptation planning and mitigation measures since the INC. Across both reports there is also some documentation of traditional knowledge and other relevant anecdotal evidence.

The National Communication reports also serve as status reports showing how the Cook Islands is affected by and is dealing with climate change issues. The reports enable tracking of progress against the ultimate objective of the UNFCCC. Equally important, the reports also facilitate national efforts towards achieving national development objectives and establishing priorities for adaptation, mitigation sustainable energy and green development.

Main Lessons

Institutional arrangements

National Climate Change Country Team (NCCCT). A national climate change country team was formed to oversee the initial national communication back in the late 1990's. This team was made up of all the heads of government departments and ministries, and it was their task to

guide the work of the project coordinator. The idea behind this approach was so each sector can have input into the national communication process. The chair of this team was the Director for the meteorology and secretariat was by the project management unit.

Increasing the technical capacity of the National Climate Change Country Team

This team established for the INC was expanded for the 2NC to include representatives from traditional leaders, the private and community sectors and even community experts. This new approach was established to gather more information outside of government and reach out into the communities so they can also provide inputs into the national report. Extensive capacity building for the NCCCT members has increased the knowledge and elevated the profile of those members who are now considered national and regional experts on climate change. Today the country team is still strong and meets quarterly to discuss climate change issues. This team is now further expanded to include the disaster risk management committee. Seeing that most of the members of the two committees were the same people and there are some similarities in the work of climate change and disaster risk management, it was best to expand the country team. Furthermore, this combined team will also oversee the progress to the recently launched Joint Disaster Risk and Climate Change adaptation plan.

Other benefits flow from the information in from the studies undertaken for the National Communication reports including informing national strategic planning in multiple sectors and development of proposals for multilateral and bilateral funding such as the Global Environment Facility Pacific Island Greenhouse Gas Abatement & Renewable Energy Project – PIGGAREP (USD\$1million), Asian Development Bank Pacific Energy Efficiency Programme – ADB PEEP (\$400K), and Kyoto Protocol Adaptation Fund Proposal (\$4.9million) amongst others.

Growing Partnerships or expanding stakeholder involvement

The Cook Islands has also experienced growing partnerships between Government and NGOs for the participatory approaches undertaken for island specific vulnerability and adaptation assessments, as well as the recognition of the need for transparency and acknowledgement that response requires an informed community approach. Government and NGO's see the value in having partnerships for implementation and for supporting activities at all levels from local to national. To fully implement projects at community level NGOs are important partners to work with.

The Cook Islands is also able to use the findings from the National Communications reports and process in negotiations at the international level. Partnerships' working in the field of climate change has further strengthened in the Cook Islands and the reason for this is so that work should not be duplicated when everyone is aiming for the same goal and at the same time keep the population informed.

Challenges and Solutions applied

Length/Duration of reporting

The Cook Islands took a long time to complete its SNC. There were a few barriers and challenges that we have faced such as the following:

Costs of consultants – the Cook Islands faced a problem of getting quality reports at a reasonable cost. This was due to the TORs elaborated were not clear on the methodologies, outputs and deliverables, for this reason the reports did not meet the expectations. To address this problem then, the project management unit took on the task of completing these reports in some cases or the consultants did not receive their final payment as the work was not delivered.

Delays in receiving funds in country from Samoa – this had caused difficult in carrying out the activities and caused delays in the implementation. Cook Islands went almost a whole year of

without receiving any funds even though the country expended more than 80% of their country funds, causing further delays in the workplan. The reason for this delay is that Cook Islands had many different officers working on its project and there was a delay in getting the new officers up to par.

The solution applied was that, we tried to work with the NES national budget and get the project to reimburse the amount owed later, but this is now no longer appropriate. Also, work with what little money there is still in country.

Insufficient funds for project management – At the start of the project there was not enough money to pay for a full time person dedicated entirely to the project. Staff of the National Environment Service took on the coordinator and technical adviser roles which the project paid for partially.

To address this problem, half way during the project the Government of the Cook Islands took on the project management staff salary. As a consequence the project staff had also additional roles and cannot work solely on the SNC project.

Project coordinators require climate change technical abilities but such personnel don't necessarily include skills or experience on project or financial management.

Solution applied was that the project coordinator work very closely with the Aid Management Division, the person who receives the money and processes the payments in the country given the manager some experience in financial management.

Designing a National Greenhouse Gas Inventory System

One of the main challenges identified during the SNC process and a main recommendation of the 2nd GHG Inventory report is the need to have an institutional set up for regular updating and reporting of the Cook Islands' GHG inventory. The Cook Islands has limited availability of people within the Statistics Division to regularly update the GHG inventory. What the Cook Islands looks forward to is to have some dedicated external resources to support our Statistics Division in for undertaking GHG Inventories in a regular basis.

When the Cook Islands carried out its SNC, there were a few things that we tried to accomplish and the Technology Needs Assessment was one of them. Although there were insufficient funds to properly carry out the countries needs assessment, the Cook Islands still managed to tackle the activities. The process was split into the technology needs for Adaptation and Mitigation. At this moment the reports had been produced, however the process has not moved further regarding the recommendations for technology implementation. Assistance would be greatly appreciated for a body to support SIDS in looking at these recommendations and implementing them.

Integrating climate change into national development

National Sustainable Development Plan

The National Vision of the Cook Islands is contained in "Te Kaveinga Nui" which sets out a framework called "Living the Cook Islands Visions – A 2020 Challenge":

- "To enjoy the highest quality of life consistent with the aspirations of our people, and in harmony with our culture and environment"
- "Te Kaveinga Nui" contains the key planning document, the National Sustainable Development Plan (NSDP) 2007–2010, NSDP 2011–2015, and 2015–2020. The objective of the NSDP is 'to build a sustainable future that meets our economic management, environment integrity, social stability, and our Cook Islands Maori culture, and the needs of our future generations.'

- The first NSDP from 2007-2010 did not mention climate change. However the recent NSDP 2011-2015 has the priority are 5: Resilience. This outcome is for climate change and disaster risk management. This means that climate change is definitely a national priority.

Integrating Climate Change and Disaster Risk Management Policy

The Cook Islands does not yet have an overall climate change policy but this is being planned for and is a priority in light of the scientific evidence presented in the Intergovernmental Panel on Climate Change (IPCC) reports which state that climate change is happening and human activities are releasing more green house gases (GHG) than ever.

The Cook Islands is beginning to develop a Climate Change and Disaster Risk Management Policy. This is done through a consultative process by conducting vulnerability and adaptation assessments with the outcomes of these to be integrated into the overall policy. The organisations that are responsible for the current assessments are the same organisations that conducted the V&A Assessments for the SNC project. The national communication process has further enhanced the capacity of NES and Cook Islands Red Cross to undertake vulnerability and adaptation assessment. Therefore, having the process and procedures in place by the national communication process has helped to move this forward quickly. This will also add value to the third national communication in having these activities included into the next report.

Creating Institutional capacity to sustain the process: Climate Change Cook Islands Unit

The newly established office for Climate Change Cook Islands based at the Office of the Prime Minister is now the focal point for climate change. This office had been established after The National Environment Service, the implementing agency for the Second national Communication, started to carry out a functional review of where climate change best fits in the public sector of the Cook Islands with additional support from the Government of Australia. Climate change activities have always been project driven. After this functional review, a recommendation to cabinet was to establish a coordinating office at the hub of government. The Government of the Cook Islands also established the Renewable Energy office within the Office of the Prime Minister in 2011. These Offices will start institutionalizing and coordinating climate change related activities and initiatives, drive policy work and facilitate implementation

Support Programmes -NCSP or a similar body

The Cook Islands sees the importance of having such a body. As a small island developing state the Cook Islands recognizes the need for such a group of experts to support countries like the Cook Islands. Support in the form of technical backstopping and having a group to undertake independent review of technical reports. Furthermore, there is also the need in carryout training programs and having meetings for similar countries for example a Pacific islands lessons learnt of National Communication implementation. This group should be able to support countries in this way, what has worked in some countries that the Cook Islands can learn from.

Conclusions and Recommendations

Overall, the Cook Islands have had a really good experience working on national communication reports. Activities from the national communication process such as the education and awareness raising activities as well as the vulnerability and adaptation assessment initiated from this process has been further enhanced and developed through other processes. Currently people in the Cook Islands seem to have an increased understanding of climate change issues.

There were a lot of lessons learnt from the NC process and this has definitely built and strengthened the Cook Islands capacity to deal with this global issue. The Second National Communication report has facilitated the Cook Islands in establishing a dedicated office for climate change, and has starting to develop a joint climate change and a disaster risk

management plan. Furthermore, climate change is now in the National Sustainable Development Plan 2011-2015. There are a few things that the Cook Islands still sees as a challenge and that is one of the reason why the NCSP is still relevant and needed by SIDS.

Recommendations for next Support Programme

Perhaps the new NCSP could play a role in securing external support for SIDS like the Cook Islands can receive support for setting up a specific organization that will be in charge for updating and reporting on the SIDS' greenhouse gas inventories. In the case of the Cook Islands the Statistics Office could receive the assistance of the new support program for setting up the basis of the new unit in charge of managing the GHG Inventory.

We recommend further for the new support programme to establish a best practice roster of experts that SIDS can draw from to help with the national communication process. The roster of experts should have approximate costs for national communications related products or alternately a black list of consultant.

Bringing into play the outcomes of Nat Coms outcomes such as Cost Benefit Analysis

Politicians make most decisions based on finances. Making a case to them about the technology needs for the Cook Islands may be difficult. There is a need for cost-benefit analysis in both mitigation and adaptation assessments so Nat coms can make the case to politicians/budget committees about local relevance and need to take action now. External support is required to look at the analysis of the costs and benefits of different options that may be listed. For example for technology options available – costs and benefit analysis so politicians can be better informed in order to make right decisions.

Islamic Republic of Iran

Experience in National Communications in Institutional Arrangements to integrate Climate Change in the National Development Plans

By: Mohammad Soltanieh, National Climate Change Project Manager for National Communications to UNFCCC, Department of Environment, Islamic Republic of Iran

Introduction

The Islamic Republic of Iran has ratified the UNFCCC in June 1996 and its climate change activities for reporting the initial national communications (INC) starting in January 1998. The author of this paper was one of the first members of the team of experts that was formed to prepare the INC. However, identification and recruitment of the group of experts familiar with all aspects of the NC process and its multidisciplinary nature was not an easy task. Although for many years climate change has been a subject of study in several classical academic programs such as meteorology, geology, geography, geophysics, agriculture and natural resources, forestry, etc., at legislative, regulatory, institutional arrangement and at policy making levels there was very little awareness of the issue at that time. Consequently, formation of the team of experts within the government institutions and ministries for preparation of INC was not an easy task. To overcome these difficulties, the National Climate Change Office (NCCO) started to search for the most qualified people with relevant education and experience among ministries and academia. In order to increase the number of experts and their awareness on the issue of climate change, the UNFCCC/IPCC guidelines were disseminated among the experts, followed by the organization of workshops for experts who had the potential of becoming members of the NC team. At the same time, meetings were held within each relevant ministry and organization to introduce the NC process.

Furthermore, the huge amount of official and reliable data needed for preparation of the NCs was not easily available or consistent with the project needs. Nevertheless, Iran's INC was successfully submitted by Iran in March 2003 and was presented at COP 7 in Marrakesh. It should be noted that the full time staff for project management at the NCCO within the Department of Environment and the national experts who were hired for the NC tasks were able to partly sustain their capacities built during INC to avoid the gap between INC and SNC. In this regard, the Top-up GEF project helped to continuously retain the NCCO and the project management team since 1999 till now (considering that TNC has started since early 2012). The SNC process started in January 2006 and was officially submitted to UNFCCC in November 2011 just prior to COP 17 in Durban. It should be mentioned that both INC and SNC cover many areas of the reporting requirements as Iran's commitments to UNFCCC.

Although there have been good experiences, continuous improvements and good practices in many "*technical issues*" (such as GHGs inventory) related to NCs, this paper focuses on two areas:

- Institutional arrangements: How to prepare the NCs on a continuous basis involving different stakeholders.
- Cross-cutting issues: How the NCs helped to integrate climate change in national development planning among multiple sectors.

Institutional Arrangement for NCs

Due to the nature and the diverse content of the NCs, almost all of the government ministries and organizations have been involved in the preparation of the NCs. An organizational chart under guidance of the Steering Committee (SC) was established as can be seen in the INC and SNC. The Steering Committee is chaired by the Head of the Department of Environment (DOE) or his/her deputy. The joint meetings of the SC members and the heads of the expert groups helped to disseminate climate change issues among different ministries and organizations. In addition, each year at least one to two workshops were organized to raise awareness within the general public awareness and experts that attended the workshops. The number of participants in each workshop was in the range of 80-120. This disseminating strategy was very effective.

After preparing the Terms of Reference for each chapter or sections of the NC by the NCCO, several expert groups were established (all reflected in Iran's NC reports). All attempts were made to identify and recruit the best and most qualified experts from relevant organizations/ministry/academia. Then an official agreement was made between the Department of Environment and that organization/ministry/academia so that the cooperation of the recruited expert included the permission to access the data and statistics and be able to report it.

Each expert group was supervised by a coordinator who was recruited based on the qualifications required as set forth by the NCCO based on the UNFCCC/IPCC guidelines for each task. The coordinators were under direct supervision of the project manager and his assistant and their office was located in the NCCO. Each chapter of the NC had one coordinator. It was the responsibility of the coordinator (under direct supervision of the project manager and his assistant) to study the relevant guidelines, to monitor the progress of the project based on the agreed workplan with UNDP, to review the progress reports for accuracy, consistency and completeness and report to the project manager. If needed the reports were returned to the experts for correction and then discussed at the SC meetings. Throughout the SNC at least 13 SC meetings were held before the final approval was given to submit the SNC to the UNFCCC. One of the main challenges confronted by the team is the data availability and reliability. This problem is particularly more pronounced during the V&A assessment. The other constraint was frequent changes in the DOE's administration and the National Project Directors.

Currently, in each relevant organization/ministry involved with the project, a special office has been dedicated to deal with climate change issues and to coordinate their work with the Department of Environment, the national implementing agency for NCs.

Regular progress report meetings were arranged at the NCCO for each task involving the relevant stakeholders. The results of the progress of the project were reported to the SC at least twice a year. As discussed in the next section, while SNC was in progress, a higher-level committee (in addition to the SC), called “*The National Climate Change Working Group (NCCWG)*” was established at the government’s higher levels, which, in addition to the final approval of the NCs, has the responsibility of development of the national climate change plans, integration into the official development plans and preparation of the “*annual climate change country reports*”.

Cross-cutting issues: Integration of CC in the National Development Plans

During early stages of preparation of the INC, and in particular during preparation of the SNC, the country team realized that it was almost impossible to prepare the NCs on a continuous basis and to integrate CC issues in the development plans without an official regulation approved by the Government.

Therefore, in 2008 the NCCO suggested to the DOE to establish an “*Interim CC Working Group*” chaired by the Deputy Head for Human Environment of DOE, and comprised of the representatives from all relevant ministries and organizations, NGOs and the Deputy President for Supervision and Strategic Planning. The objective of the measure was to coordinate activities of different organizations regarding CC issue and at the same time increase synergies among those organizations. The task of this group was to develop the National Rules of Procedure (Regulations) for Implementation of the UNFCCC and the Kyoto Protocol. This interim group, worked intensively for a year and through a consultative process, developed the “Regulations”, which after discussions in several meetings at the Cabinet’s Sub-Committees, was finally approved by the Cabinet in August 2009. The National Working Group involved in the preparation of the “Regulations” was at the level of deputy ministers; this has facilitated the integration of CC issues into the national development plans. Almost simultaneously, the NCCO developed the national regulations for CDM projects approval by the Designated National Authority (DNA), which was approved by the Cabinet in November 2009. It should be mentioned that the “Regulations” was recently (October 2012) revised by the Cabinet to overcome some of the weak points of the first version.

According to the “Regulations” the NCCWG was established and is comprised of representatives from the following ministries/organizations:

- Department of Environment
- Ministry of Foreign Affairs
- Ministry of Agriculture
- Meteorological Organization
- Ministry of Industry, Mines and Commerce
- Ministry of Interior
- Ministry of Oil (Petroleum)
- Ministry of Energy
- Deputy President for Planning and Strategic Supervision.

If needed and appropriate, representatives from NGOs, academia or other governmental organizations can be invited to the meetings of the NCCWG. The NCCWG, which is chaired by the Head of the DOE, has the following main responsibilities among others:

- Establish the institutional arrangements within each ministry to deal CC issues.

- Preparation of the “*annual climate change country report*” by all relevant organizations and final approval of the NCs. The content of the “annual CC country report” closely follows the NCs content, which indicates how NCs helped mainstreaming.
- Planning for prevention and reduction of the adverse impacts of climate change,
- Planning and implementation of programs for mitigation of climate change.

Article 193 of the Fifth National Development Plan, whose implementation has started in 2011, has mandated all relevant ministries to develop and implement programs leading to reduction of GHGs and other air pollutants. The adverse impacts of climate change in important areas like water resources, agriculture and forestry, human health, biodiversity and coastal zones have also been foreseen in the related sectors.

Conclusion

The NC process has been a major driving force for both reporting to the UNFCCC on a continuous basis and for streamlining the climate change considerations into the national development plans. Institutional arrangements established within each ministry for CC, the experts trained during preparation of NCs, the workshops held during preparation of the NCs, the role of the SC meetings with CC experts, the public awareness workshops, the interviews and press conferences and enhanced educational and research programs in academia have all helped to integrate CC into development plans.

Nevertheless, the developments described above are rather slow and face major challenges before they could be fully operationalized. To overcome these pending challenges, institutional arrangements within each organization must be strengthened by allocating more funds and by recruiting trained experts in the relevant areas. Furthermore, the law that was included in the Fifth 5-Year National Development Plan concerning the control of air pollutants including greenhouse gases should encompass all aspects of climate change such as vulnerability and adaptation, etc.

Jordan

Institutional Arrangements for National Communication Preparation in Jordan

By: Batir Wardam TNC project Coordinator-Jordan

Introduction

Jordan has the privilege to be the first Non-Annex I country to have submitted its National Communication report, back in 1997. The report, supported by GEF/UNDP, was the first experiment of its kind in the country and was prepared by the General Corporation for Environmental Protection (GCEP) and a consortium of private sector consulting firms. The process of the preparation of the INC included substantial capacity development initiatives targeting public sector employees and assisted in raising technical capacity in all sectors under analysis. The major technical constraint that faced the inventory process was related to the activity data gaps, which is believed to have introduced a high level of uncertainty to the estimates (uncertainty analysis was not carried out in the INC). These activity data gaps were mainly related to the data un-availability at disaggregated levels. In most of the cases, activity data reported were aggregated.

It took more than nine years for Jordan to engage with the Second National Communication project that was initiated in 2006. This time it was prepared by the much influential Ministry of Environment and used national expertise to a large extent. The SNC report was published in 2009 and received positive feedback from the UNFCCC secretariat and GEF/UNDP networks. The SNC was much more advanced than INC. The SNC provided the latest inventory of greenhouse

gas emissions together with a vulnerability and adaptation assessment of the country's priority sectors. The GHG inventory in the SNC covered all sources and sinks, as well as all gases, as mandated by 17/CP.8. Estimates of the key sources, sensitivity analysis and uncertainty level were provided. Also, supplementary indices such as CO₂ emissions per GDP and per capita were presented.

Project Management Arrangements

The SNC project management arrangements followed the typical UNDP NEX implementation modality. The appointment of a project manager and an assistant working within the premises of the implementing agency (MoEnv) allowed for a mutual benefit. The MoEnv were able to tap into the technical and financial resources of the GEF/UNDP to enhance its climate change programme while UNDP has more impact on mainstreaming climate change in the national policies. During and after the SNC Climate change was introduced as a major priority area in the main public planning document (The National Agenda) and in the National Executive Programme. More recently Climate Change adaptation was introduced in the new UNDAF (2013-2017) as one of 4 Outputs under the Environmental protection Outcome.

The SNC project management modality has also introduced the possibility of involving staff and experts from the MoEnv in the SNC activity thus empowering them with the required capacity and ensuring institutional buy-in for the project objectives and deliverables.

The institutional arrangements for the SNC project were both complex and effective. The process that took a lot of time to be launched resulted in a significant improvement over the INC, and laid the groundwork for the TNC at both technical capacity and human resources availability.

Stakeholders Engagement

The National Committee for Climate Change

The institutional arrangements for Climate Change in Jordan were provided with a major advantage in 2006 with the formation of the National Committee on Climate Change. The Committee was formed by a decision from the Prime Minister and includes representatives from public, civil and academic institutions that cover a wide range of sectors and disciplines. The committee is empowered to pursue strategies and adaptation actions related to climate change; another committee was established as the Designated National Authority (DNA) to meet all the requirements of the Clean Development Mechanism (CDM) of the Kyoto Protocol.

The Climate Change National Committee has grown in number, representativeness and impact over the years. Since 2007 it has been actively involved in influencing all decisions taken in the context of climate change management in Jordan including projects and initiatives conducted by the Ministry of Environment and other institutions. It has reviewed and approved project proposals, projects' outcomes and provided advice to the MoEnv on how to address climate change challenges. In 2012 it approved a suggestion to develop a national policy on climate change in Jordan to be supported by GEF/UNDP in an unprecedented move in the region.

The establishment and empowerment of the National Climate Change committee has been a major contributor to the increase of climate change activities in Jordan in the past 5 years in particular. The SNC process has been monitored and streamlined by the Committee in various occasions and helped in the access to valuable data sources during the GHG inventory process in particular, especially data from energy activities. Capacity development efforts conducted by the SNC have targeted the Committee members and were based on needs-assessment. The Committee discussed the draft ToRs of the various taskforces, the draft reports and findings and participated actively in the SNC public events. The SNC project hosted the NCSP regional training workshop on SNCs that was organized in Amman (January 2009) and involved many national and regional stakeholders focusing on Vulnerability & Adaptation.

When some members of the Committee were recruited as national consultants in the SNC for their unique expertise they had to leave their roles in the Committee and be replaced with other members to avoid conflict of interest.

Sustainable capacity development for Human resources

During the SNC process, a huge emphasis was put on the enhancement and use of national human resources in a sustainable manner. Experts from the public sector who were trained by various Climate Change activities prior to SNC were recruited for the SNC to minimize duplication of capacity development efforts and to create a national roster of climate change experts that would be available for any future National Communications or projects/programmes that require detailed expertise.

The nucleus of experts that was created and nurtured before and during SNC acted a trainer unit for their counterparts in various institutions. The knowledge gained through the SNC was trickling down to other staff, especially in Ministries and public sector institutions to increase the number, coverage and technical capacities of climate change human resources in Jordan.

Data Accessibility and institutional interactions

One of the major barriers facing National Communications in various countries is the accessibility of data, or rather the lack of it. The SNC project addressed this problem by ensuring a wide representation and involvement in the project by “data holders” from public and private sectors. The participation of data holders is essential to the collection and processing of data with the most improved set of reliability and national ownership. Data holders were selected as national experts and reviewers in many phases of the project and all the results and figures that were published in the SNC report were never questioned by public authorities and were considered as highly indicative of the actual situation in the country.

Prospects for the TNC

It is hoped that the TNC will use and enhance the existing institutional structure to the maximum possible benefit and that it can create new institutional arrangements to strengthen the current base and open up more opportunities and facilitation for the implementation of future NCs.

The TNC will use the Climate Change national Committee as a long-term advisory committee for the project. All strategic decisions and trends for project implementation will be discussed and approved by the NC.

The TNC will use the existing knowledge accumulated with the current base of human resources in the country in its various task forces and will introduce new members with high potential to participate in the taskforces that cover new sectors (socio-economy, gender and health) to increase the scope and representation of national experts in all climate change related disciplines. Various capacity development activities are planned to engage the highest number and diversity of human capital.

To facilitate the process of data accessibility the TNC hopes to create a legal tool (bylaw, regulations) that will ensure disclosure by major GHG emitters of their emission rates to the MoEnv. The tool will help the MoEnv to gather and process such data on a continue scale and build an evolving database that shows trends in emissions in real time rather than facing gaps in data that could only be retrieved through the NCs.

The INC and SNC processes focused on utilizing and empowering the existing institutional settings and using them as resources for technical and administrative support. Within the TNC it is hoped that a paradigm shift will occur by recommending and supporting new institutional mechanisms to respond to the emerging needs of sustainability of data accessibility and knowledge management.

Kuwait

Experiences: from Institutional arrangements; capacity building to Lessons Learnt

By: Dr. Abdul-Majeid Haddad, Regional Climate Change Coordinator, UNEP/ROWA
Mr. Sherif Al-Khayyat, Head, Climate Change Section, Kuwait Environment Public Authority (KEPA)

Introduction

The design of the INC development process is of critical importance to the achievement of the goals, objectives and results anticipated from national communication. It should be remembered that the INC itself is not a mere report to be submitted to the UNFCCC but is an *instrument* and vehicle for a national dialogue, science-policy interface, policy setting, integration means, platform for capacity building and networking. In Kuwait, the design of the INC process took considerable time and involved key players in the INC discussing with national institutions what can work and what cannot. Of course, in all the discussions we had with stakeholders, emphasis was put on how to *capitalize* on the *process* to *maximize* the benefits to fulfil the obligations towards the convention and to benefit sustainable development and capacities of the country.

During the design phase, there were some doubts expressed by several people that we will ever be able to establish a national team who can deliver the sort of technical work needed for the INC. That is because the subject of climate change is considered new to most national institutions and experts, that there is a shortage of dedicated, interested and committed nationals and the general culture of outsourcing of such technical work to international consulting houses. The project proved the opposite and has been one of the success stories in the region. The Team was able and committed, they produced high quality work and they expressed appreciation for the opportunity to learn.

Kuwait University, which is the only state owned university, was initially reluctant to engage in such a small and tedious project. But continuous dialogue led to the understanding of the strategic importance of the project and how it should be viewed differently. Indeed, the project has raised the profile of the University not only that it will be able to publish scientific papers but also opened up opportunities for new research lines on climate change and helped them link with the broader global scientific community working on climate change. Furthermore, joint research programs between Kuwait University and a Sub-regional University called Arabian Gulf University was established on Impacts of Climate change on water resources. This contributes to strengthened regional and south-south cooperation.

The INC project is overseen by the already established National Climate Change Committee. Early buy-in from the Committee was sought, each member of the Committee was met with and consulted on the design and their views were taken into consideration.

Execution of the Activities

A co-executing arrangement was made between UNEP and the Kuwait Environment Public Authority (KEPA). UNEP would lead the international and technical support and quality assurance to the project while KEPA will lead the national team and national inter-agency coordination and consultations, in addition to its responsibility for integration into national development processes such as the National CC Committee, The Higher Council of Environment and the Planning Commission. In addition to the project document, a MoU was signed to lay out the details and respective roles and responsibilities.

Technical Execution Activities

For contracting purposes, the Project Components were split into two divisions: 1) The GHG Inventory & Mitigation Assessment and 2) Impacts, Vulnerability, & Adaptation. The latter was sub-contracted to Kuwait University while the first was contracted to a Group of national experts.

The Project comprised a total of six Working Groups (WG) with a good mix of experts from Academia and its respective sector (mainly government technical staff). This mix proved to be the best option not only to establish the science-policy interface but also to enhance capacities on several aspects of the national communication.

Regional Advisors: A Critical Success Factor

Since this is the first national communication prepared totally by national experts, it was critical to invest in technical support and advisory services from abroad. Therefore, for each Working Group, a regional advisor was assigned to work very closely with the team. These Advisors are experts in their fields and have actually done work on INC in their countries (most of them already completed the SNC). The Advantage of having regional advisors as follows:

Familiarity with the regional and Kuwait context:

- Regional Advisors and some of the Kuwaiti team members meet each other more frequently in regional and sub-regional meetings increasing the opportunity for more interactions and discussions of progress, obstacles and solutions
- Regional Advisors speak the same language and are passionate in helping neighboring countries
- At least two *joint research studies* have been initiated by the regional advisor and their respective team members
- One member of the Kuwait team was further taken by the regional institution to complete his PhD studies on the same subject.

Working Group and National Consultation Meetings

Each Working Group developed their detailed work plans (including timeline, roles, and milestones, description of the approach, methodology and outputs) at the inception workshop. Meetings were then organized by the WG Leader and hosted by one of the institution involved. It should be acknowledged that most of the costs associated with hosting Group meetings were provided by the hosting institution as part of their co-financing and also *clearly showed their interest in integrating climate change into their plans*. For example, Kuwait Petroleum Corporation (KPC) hosted several of the GHG & Mitigation WG meetings including state-of-the-art training facility for LEAP training. At the same time, KPC embarked on GHG Management System whereby members of its Task Force were attending the WG meeting and training activities.

Coordination and Networking

Advanced communication infrastructure in Kuwait helped a great deal in communication. The team established an e-Group to inform members about progress, to create meeting invitations, and to invite comments. A space in the Dropbox was opened for the Group to exchange large files and also to share background documents or useful studies. However, it took some time to make sure that information, especially with regard to meeting reports and technical discussions, is shared no matter who it is addressed to. The Team was always encouraged to pose questions to members and Regional Advisors.

During the project execution, regular and more frequent meetings (physical and virtual) took place between the three project partners (UNEP, KEPA and KU). This has helped sort out any obstacles and also encouraged new ideas to improve future processes.

The project had four main national consultation workshops; two at the inception, one at mid-review and the last one as a Validation Workshop. These workshops were a mix of consultation, review, training and planning. The agenda is tailored to the need of the participants. In addition to the core team, the KEPA invited larger audiences to benefit and contribute to the process and quality of work.

Capacity building for the national communications process as a whole

The project was designed with capacity building as the core objective stated in the project document:

“The immediate objective of the project is to assist the State of Kuwait in implementation of obligations under UNFCCC by preparation of its Initial National Communication as well as to strengthen its technical and institutional capacities to integrate climate change concerns into sectoral and national development priorities”

Therefore, each step in the process was an opportunity to include capacity building and development integration elements. The Regional Advisors and UNEP Technical Manager played an important role in delivering capacity building activities. The resources available on the UNFCCC and NCSP websites were of great value to the Team. In addition, the opportunity to meet members of the team during COPs and Inter- meetings was valuable in linking national to global convention processes. It also provided further insights and experience for elaborating climate change programmes in Kuwait.

As part of the mainstreaming spin off of the project, the KEPA has established a Climate Change Unit with core staff and office equipment. A Special Advisor has been recruited to help KEPA develop a framework for an Action Plan on Climate Change and A Capacity Building Needs Assessment and Action Plan for the CC Unit and relevant stakeholders in Kuwait at large.

Public Awareness: The project established the baseline for Public Awareness and Education by conducting a publically disseminated survey. The results of the survey were included in the INC report. Most importantly, the project partnered with local NGO's to conduct PA activities in schools, media outlets and the general public. It will include posters, short messages using ICT and social media and visits to schools.

Take home messages:

1. Invest time and resources in the process design are a must to engage all concerned and give ample and equal chance for all to provide inputs and insights.
2. Clearly define project expectation as a whole and describe in detail the nature of outputs (annotated outlines of these projects very useful to have at the inception).
3. Always start on the assumption that there is difficulty in data collection. It is important to document every step in the data collection process and also to annotate data collected. This will help keep institutional memory and for the basis for a larger data depository or bank.
4. Careful selection of team members is necessary. Profiling of the team at the inception is useful and there should always be a backup plan. In other words, it is better to be inclusive rather than exclusive. The more team members you have the better chance to have the work completed. However, the team should have core and non-core members although not explicitly shown in the International experts and Advisors should be knowledgeable about national context in addition to their knowledge and experience on the subject matter. This helps a great deal in crafting suitable programmes for technical support.

Niger

Institutional Arrangements and Stakeholder Coordination to Support the Preparation of the National Communications

By: Dr. Kamayé Maâzou, Executive Secretary of the National Council of Environment for Sustainable Development and Abdoulaye Issa, National Coordinator of Greenhouse Gas inventories

Introduction

Niger has developed its Initial National Communication (INC), which it was presented at the Sixth Conference of the Parties (COP 6) to the UNFCCC in November 2000 in The Hayes (Netherlands). Then, the Second National Communication was presented at the Fifteenth Conference of the Parties (COP15) in December 2009 in Copenhagen (Denmark). Currently, Niger is preparing its Third National Communication (TCN) on Climate Change. Throughout the national communications the following elements emerged: (i) a presentation of national circumstances, with a particular focus on aspects of policy development related to key components of the climate change process, (ii) the national inventory of Greenhouse Gas emissions (GHG), (iii) capacity to mitigate emissions of greenhouse gases by linking with the policies of social and economic development of the country, (iv) programs containing measures to facilitate adequate adaptation to effects of climate change. These are National communications' tools to help decision makers and negotiators.

NC Process Experiences and Challenges

Niger has developed a National Plan for the Environment for Sustainable Development (PNEDD) which constitutes its national Agenda 21. The PNEDD is the inspiration for the framework of all policies relating to environmental and sustainable development, and the implementation is coordinated by the National Council of Environment and Sustainable Development (NCA). Created in January 1996 under the Prime Minister's Cabinet, the CNEDD coordinates the six (06) PNEDD priority programs. To this end, specialized technical committees including the Technical Commission of Climate Change and Variability (CTCVC) were created for this issue. It was founded in 1997 and is composed of representatives of public services, and Para-public, non-governmental organizations, research institutions, training and academic institutions, civil society and the private sector. Its mission is to support the Executive Secretariat of the National Council of Environment for Sustainable Development (SE / CNEDD) in the implementation of the Programme on Variability and Climate Change, and it is one of the six priority programs of PNEDD, whose main objective is the implementation of the provisions of the United Nations Framework Convention on Climate Change at the national level. The preparation of National Communications was placed under the Executive Secretariat of the National Council of Environment for Sustainable Development (SE / CNEDD), the focal point of three (3) post- Rio conventions including those on climate change (UNFCCC). The Executive Secretariat of the CNEDD hosts the Project Management Unit (PMU) to ensure the implementation of development projects of National Communications under the supervision of the National Technical Commission on Climate Variability and Change (CTNCVC.)

In Niger, the study focused on self-assessment of the Initial National Communication which noted the low consideration of data holder's opinions in the commission. This has led to a 2006 revision of the decree powers and composition of the commission through the creation of five (5) thematic working groups within the commissions. These are titled Energy-Water-Road Infrastructure; Agriculture, /Livestock; Forestry / Fishing / Wetlands; Industrial Process / Waste/Health; Clean Development Mechanism.

These thematic groups have contributed to the elaboration of the Second National Communication through improvement of data access on Green Gas House inventories activities, the studies carried out on vulnerability of sectors and communities, capacity building of sectoral persons with emphasis on Clean Mechanism Development.

Challenges

The remaining challenges are:

1. Integration of data collection necessary for the inventory in the work of state services through the provision of a guide for reporting data;
2. Strengthening information and training services to the state on issues related to GHG inventories;
3. Taking into account the data for the inventory in the facility activity report forest services;
4. Conducting a national forest inventory in order to have a better understanding of potential sequestration;
5. Conducting the surveys to refine the estimate of trees outside forests, including trees in urban and rural areas;
6. Implementation at the SE / CNEDD of a database to regularly enter data through a system of annual data transmission activities by their holders;
7. The wider dissemination of scientific documentation by providing physical media (book, CD...) and also the creation of a library for this purpose;
8. The incentive to research climate change issues given the extent that the subject is on the international scene, in particular in the field of development cooperation and private funding;
9. Continued awareness of policy makers and private financing mechanisms put in place by the international community as Mechanisms for Clean Development Mechanism (CDM) to attract data providers to keep reliable statistics.

To overcome these challenges, the national team has built on the institutional framework which the UNFCCC national focal point attached to the Premier Minister Cabinet. This institutional linkage has enable several meetings and exchanges between actors/members of the National Commission on climate changes representing the sectoral ministries, civil society , research institutions and private sectors. This has allowed assurance of accessibility, collection treatment and recording of data which contributed to the elaboration of the Second National Communication.

The output of the NC process

The preparation of the National Communications allowed Niger to:

- Develop and adopt the National Strategy and Action Plan on climate change and variability in 2004. This allowed:
- The development of the National Action Plan for Adaptation to Climate Change (NAPA), whose objective is to help mitigate the adverse effects of climate change on the most vulnerable populations in the context of sustainable development and the fight against poverty in Niger in 2006. At this level, a certain number of adaptation projects were implemented by public structures, NGOs, research institutions. As an example, we can list the project of resilience reinforcement for water and agricultural sectors co-financed by GEF, and Community Base Adaptation project developed by NGO Care International
- Improving the quality of GHG inventories, with methodologies and tools provided within the framework of the regional project "Capacity Building for Improving the Quality of GHG Inventories in West Africa and Central"

- The development and implementation of National Self Project of Capacity Building for Global Environmental Management (NCSA).] This project was developed in 2006, a Strategy and Action Plan for the implementation of capacity building activities under the conventions on the fight against desertification, biodiversity and climate change. Individual training in capacity building has been done
- The SNC included the study of eight (8) regions of the country: Agadez, Diffa, Dosso, Maradi, Tahoua, Tillaberi, Zinder and Niamey Urban Community.
- In the future, the extension of the NC studies should be strengthened and expanded, particularly at the departmental level and local communities of the country.

Also, allow for better resilience and sustainable human development of the Niger population, the Government revised Decree No. 2011-057/PCSRD/PM January 27, 2011, the powers of the Executive Secretariat of the CNEDD by entrusting the task of process focusing on governance issues and climate adaptation and mitigation of adverse effects of climate change. More specifically, it has allowed the Integration of climate change adaptation into policies, strategies and programs; and climate change and adaptation fundraising.

From 2011 onward, the SE / CNEDD developed tools to the Integration of Climate Change Dimension (IDCC) in Policies, Plans, Programs and National Development Strategy. To this end, a National Policy on Climate Change was developed in 2012; the climate change dimension is being integrated into the Communal Developments Plans (PDC).

Lessons Learned and the Way Forward

The institutional anchoring of SE / CNEDD, the institution responsible for developing national communications, as well as a multidisciplinary and participatory approach used in the development of National Communications, has created a dynamic and collaborative work between actors (State, civil society, private sector) and specialists in various fields: agriculture, livestock, forestry, water resources, energy, economy, communications, meteorology, climatology, health, etc. This dynamic must be maintained for the development of future National Communications and implementation of projects from the NAPA, Pilot Program on Climate Resilience (PPCR) and other initiatives related to climate change and variability.

Also, there is a need to improve data collection activities through (i) filling gaps related to insufficient material collection and archiving (not computerized databases) to analytical and communication skills (GIS, NTIC) services for most data producers, and (ii) the development of regional climate model with a spatial resolution adequate for the development of scenarios climate Change in a given time horizon. Indeed, the model-MAGGIC/SCENGEN used in the context of the two CN does not provide sufficiently accurate results (low spatial resolution of 5 ° x 5 °, or 555 km x 555 km).

Sudan

National Communications Institutional Arrangements and Capacity Building

By: Ismail Elgizouli, National Communication, Project Coordinator

Introduction

To date Sudan has prepared two National communications in order to meet UNFCCC objectives to build capacities and to meet the country's obligation towards the convention and to integrate climate change in the national development plans and programs.

The first National Communication was carried out with limited knowledge about climate change. The first project management team included only three persons and a steering committee was set up drawing professionals from relevant institutions based on an initial study that assessed the relevant institutions, their term of reference, etc. An inception workshop was attended by all stakeholders to launch the project. Technical assistance and training from the Stockholm Environment Institute Boston Centre (technical partner) as well as guidance from NCSP, UNDP and UNFCCC were obtained and helped greatly in the implementation of the project.

IPCC and UNFCCC training packages were digested by some of our University professors and they in turn trained our national staff in climate change science as well as different facets of the studies of the NC such as inventory, vulnerability and adaptation and mitigation. From this training the best professionals were chosen to form technical committees from relevant institutions to conduct the relevant studies.

Unlike the INC, when preparing the SNC there was a lot of experience gained from the INC and other projects such as NAPA which facilitated the implementation of the SNC project.

NC Process

For the INC a project coordinator, a deputy project coordinator and an information specialist were recruited to implement the project assisted by technical backstopping from EIS Boston USA and supervised by a steering committee from all relevant sectors.

Initial studies were conducted to identify stakeholders, their mandates, organizational structure and the ways to participate in the project. The preparation of the SNC proposal started with a self-assessment exercise which involved a stocktaking exercise: a highly consultative and participatory process of needs assessment to identify critical priorities for UNFCCC implementation during the SNC. This process was built upon previous activities, studies, experiences, and institutional settings. The stocktaking exercise took about 15 weeks and brought together about 100 participants representing technical, planning and policy making experts from different ministries, public institutions, NGOs, academia, and the private sector. The outcomes of the stocktaking exercise, including the main elements of proposal for the SNC, were then presented to a wider group of stakeholders from all related institutions in a final consultative workshop. Discussions during this workshop covered critical areas of the National Communications process (e.g. existing data sources and their reliability, the gaps, the methodologies and the capacity building needs).

The Second National Communication (SNC) therefore has been built on findings from the Initial National Communications (INC), and other documents such as the NAPA in accordance with guidance of the UN Framework Convention on Climate Change (UNFCCC) and in the long term to strengthen Sudan's capacity to fulfill its commitments to the UNFCCC on a continuing basis. The SNC integrated its outcomes within the framework of continuing to implement and expand international and national agreed best practice strategies regarding the UN Framework Convention on Climate Change (UNFCCC). This relates directly to the achievement of MDG 7, target 9 which relates to integration of the principles of sustainable development into country policies and programs to reverse the loss of environmental resources.

Institutional Setup

The organization set up to implement the SNC is composed of a Steering Committee, National Climate Change Committee (NCCC), Project Coordination Unit (PCU), national technical committees and stakeholders as illustrated in fig. 1.

Project Steering Committee (National Climate Change Committee (NCCC))

Initiation of the project included the establishment of a high level political oversight and coordination body that includes representatives of stakeholders from all relevant sectors including government research and academic, non-governmental institutions and UNDP/GEF representatives. This National Climate Change Committee (NCCC) will also serve as the Project Steering Committee (PSC) and will be chaired by the Secretary General of HCENR and the National Project Coordinator (NPC) will serve as its secretary.

The Project Coordinating Unit (PCU)

The PCU is composed of a Coordinator Team Leader of V & A Study, Team Leader of Inventory & Mitigation Studies Admin office, and Secretary.

The PCU carried out all the activities specified in the project document and provided overall project management and supervision to ensure that the implementation of the project activities are in line with what was agreed/approved and stipulated in the project document.

Technical backstopping had been provided by SEI-US in order to enhance national capacities in areas where national expertise are not sufficient or lacking. Assistance provided by staff at SEI-US will take the form of technical support in the updating of the GHG inventory, GHG mitigation analysis and V&A methods and tools, as well as support in the review and finalization of the SNC.

National Technical Committees (NTCs)

It was re-constituted on the basis of the previous national teams of experts from relevant sectors government, non-government, research, academic and private sectors institutions. The NTC consists of two main experts groups on (a) GHG Inventory and Mitigation and (b) Vulnerability and Adaptation and a third ad-hoc group of experts for national communication and other Information (Research and Training). The membership of the committee is based on technical expertise of the individuals involved and the mandate of their respective institutions in areas relevant to the climate change. The NTC has a technical and consultative role in the project and helps the project to maintain contact with relevant institutions.

Implementing agencies of the NCs projects were the UNDP Sudan and the Ministry of International Cooperation (MIC) and executed by the Higher Council for Environment and Natural Resources (HCENR).

Capacity Building

Training for the two National communications is accompanied by a number of workshops and training. For the first national communication the inception workshop was attended by more than 150 people from different institutions. The stakeholders introduced the project and lay the groundwork for its implementation. This was followed by three different workshops in the field of Inventory of GHGs, Vulnerability, impact and adaptation and the third were in Mitigation of GHGs. Each one of these workshops was attended by more than 100 participants from relevant sectors, institutions, CBOs and private sector. Each workshop was followed by intensive training for smaller groups of about 50 participants in each area. On job training was secured to two of the project staff in three neighbouring countries. Also the project team has participated in a regional workshop organized by UNFCCC and NCSF which was very valuable and helped a lot in preparing our National Communications.

The same process was followed in the SNC but more intensive and deep improving our experience and knowledge compared to the INC. In order to deepen national capacity and consensus among key stakeholders and non-governmental organizations more training is needed especially on data collection, processing and analysis in relation to climate change issues, monitoring, evaluation, risk assessment in the field of GHGs and the relevant scenarios of climate change; impact models and methodologies of assessment in GHGs inventories and

vulnerability and adaptation, training in models adoption and modification to suit our national conditions.

Process participants:

- About 50 institutions including governmental organizations, research and academia and civil society organizations participated in the process.
- More than 500 experts participated in the scientific studies, the preparation and review of the INC
- A national climate change committee was established
- 3 national teams of experts on GHG inventory, Mitigation analysis and V&A assessment were established
- Focal units are being established within relevant institutions to handle climate change issues

Challenges

The NCs faced many challenges during their implementation, the most important are:-

- The number of qualified staff involved in climate change was insufficient. This has been partially solved by training our staff at neighbouring countries, sister projects and workshops conducted by the NCSP.
- The structure and affiliations of government institutions related to climate change are subjected to frequent change on one hand, and the personnel that are trained leave their posts for different reasons on the other hand. This resulted in limited efforts to foster awareness and understanding of climate change issues. To overcome this, many workshops and presentations at different levels were conducted to upgrade institutional capacities and to increase awareness of policy makers.
- At the Universities and Research Centers, training and research in climate change issues were not well established. Efforts were carried to integrate climate change science impacts and mitigation analysis in many courses and programs offered by these institutions
- Links between climate change and development programs in different sectors were not clear. Through time and after many workshops and studies on the impact of climate change on different sectors many policy makers and senior official became more involved and aware of climate risk and therefore have incorporated climate change into their plans.

Lessons learned and Good Practices

In the course of preparing NCs a number of good practices have been achieved, including the following:

- A national climate change process has been established with active participation from all relevant stakeholders;
- Awareness has been created within the participating institutions as well as among the public through media and public events
- Key stakeholders must be subjected to training and or have the technical capacity/knowledge on GHG's, CC impacts and mitigation analysis as well as on information technologies;
- Local expert involvement which resulted in the creation of adequate capacities within the different related sectors to handle climate change issues;
- International technical assistance, which resulted in training (vulnerability, mitigation) and networking;

- Trainings in inventories, mitigation analysis, and vulnerability assessment have increased the capacity to undertake independent analyses;
- Technical capacities is being built within relevant institutions to deal with climate change issues;
- Very useful partnership created with SEI_B; and
- Other lessons were learned from participation in regional initiatives and participation in international climate change events cooperation and communication links established with other international institutions and parties
- Establishing Institutional arrangements for National Communication: activities that aim at establishing a permanent institutional infrastructure for preparing GHG Inventory and National Communications, they may include:
 - Identification of the relevant institutions that should be included in the process
 - Defining role and responsibilities.
 - Building technical capacities and effective coordination mechanisms.
 - Building awareness
 - Developing agreement for continuous support and commitment.

Recommendations to improve the process

To improve the process in both institutional and capacity building the following is recommended:

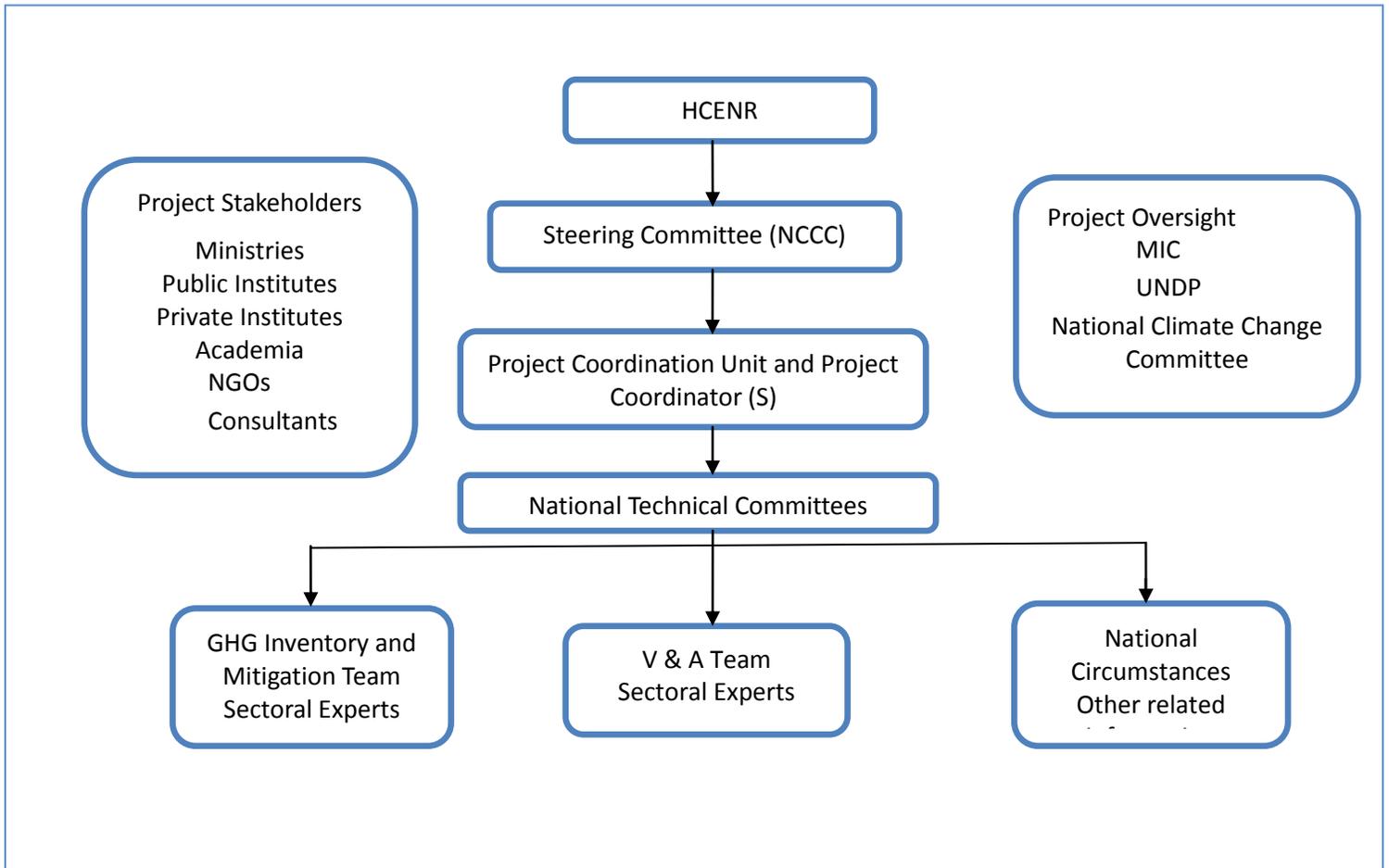
Institutional set up:

1. Convert the National Climate Change Committee of the NCs into permanent Climate Change Committee
2. Strengthen the Climate Change Coordination unit established within the Higher Council for Environment and Natural Resources to take the responsibility of all climate change issues
3. Strengthen the established institutional structures in the five other institutions (emitting sectors) to prepare Inventory on a continuous basis by providing these units with computers, software and methods and tools used in climate change studies and assessment.

Capacity building with regard to the following:

1. Data management techniques
2. Development and use of socio-economic scenarios
3. Development of climate scenarios (selection and down-scaling of GCMs)
4. Use of impact models in V&A assessment
5. Modelling and long-term projection techniques
6. Uncertainty management in GHG inventory
7. Provision of technical backstopping and material (e.g. models and training packages).
8. Establishment of joint regional programs and projects (e.g. GHG inventory database, impact assessment)
9. Provisions of adequate financial resources

Figure 1: Sudan Organizational structure



While GHG Inventory is one of the main components of the NC process, from the papers presented in this section, it became clear that critical conditions for successful GHG inventory go beyond the technical capacity to elaborate the Inventory.

In general, institutional structures under existing national systems are mostly built around individual arrangements. While data availability is the backbone of every inventory, modalities for data accessing are mostly based on informal arrangements, with very little involvement of key stakeholders who generate the data. Improving data access as well as the technical quality of national GHG inventories can be very beneficial since reporting major sources and sinks of GHGs with high confidence is important for identifying not only the most appropriate mitigation measures but also for determining national appropriate mitigation strategies. The papers also highlight the need to develop processes that will permit optimum arrangements for a sustainable process that will simultaneously collect, process and archive data generated by the NC Process. These should also be conducive to setting up a legal structure that will ensure the continuity of the NC process and its outcomes.

The following countries are depicted in this chapter:

1. **Egypt** Strengthening GHG inventory Preparation & Climate Change Mitigation through Developing Capacity of National Experts in Climate Change Mitigation
2. **Ghana** 's Experiences on Institutional Arrangement and Data Availability Under National GHG Inventory System
3. **Macedonia** 's Good practices in the preparation of the GHG Inventory

Egypt

Strengthening GHG inventory Preparation and Climate Change Mitigation through Developing the Capacity of National Experts

By: Elsayed Sabry Mansour (Ph.D.) National Project Manager; Egypt Third National Communication

Introduction

Egypt submitted the Initial and Second National Communication reports to UNFCCC in 1999 and 2010 respectively. According to its INC and SNC, Egypt's most vulnerable sectors to climate change are the following: coastal zones, water resources and agriculture. The experience gained from conducting a self assessment exercise for the SNC as a preparatory phase for the preparation of the Third National Communication (TNC) project demonstrated many challenges among which are the need for continuity and coherence across different segments of the communication process and report, both in the sense of consistent data, timeframes, etc.; and in the sense of a coordinated document that sends unified messages and that can guide the government policies in many areas.

Another area of importance is the expansion of the roster of experts; improvements in capacity building will be among the project objectives. Mainstreaming the outputs of the third national communication into the national plans is a major challenge that still needs to be met.

The goal of this project is to prepare Egypt's Third National Communication through building on the previous and ongoing work on climate change. For example the work undertaken under Egypt's Initial and Second National Communication, Egypt National Environmental, Economic and Development Study (NEEDS) for Climate Change and other climate change related studies which are laying a solid groundwork and have established a baseline for developing such a product. Working on priority areas / issues selected under the stocktaking exercises would be the main focus of the project. The initial emphasis of the project will be on:

1. Developing GHG inventory for year 2005 and analyzing the abatement measures of GHG in Egypt
2. Assessment of Egypt's vulnerability to climate change impacts and identifying adaptation measures in light of the country development context, taking into account related entry points for the selected areas.
3. Gaps, uncertainties and constraints along with other information related to the UNFCCC will be addressed as indicated by 17/CP8.

Priorities and new areas for work under the TNC that have been identified:

1. To increase the collection of disaggregated data:
2. To systematize and regularize data collection, including specific project activities related to reviewing consistency in the TNC; such as the time frames and assumptions used for modelling and analysis in the different segments of the report;
3. Designing a strategy to ensure that findings are channelled back to the relevant agencies and present the findings of the NC in a format that is accessible to high-level decision-makers in key sectors; e.g., through policy briefings and policy papers based on TNC findings;
4. Finally enhancing activities to increase the engagement of the private sector and NGOs in climate change issues and provide opportunities for review of the TNC prior to submission.

GHG Inventories

Assessment of baseline and issues identified

The Egyptian Environmental Affairs Agency is solely responsible for climate change issues in Egypt, representing the focal point of the UNFCCC. Agriculture is increasingly becoming an energy consuming sector including energy consumed through transportation of agricultural products & fertilizers.

Most of the methodologies, assumptions and data used were not well documented in previous estimating emissions from many source categories; this is an issue of concern. Although inventory data is available by source category, only two key source categories, namely energy and waste were identified for trend analyses in the SNC.

All activity data concerning each sector was national. For the energy sector, activity data were taken from aggregate data of sectors as briefed in the annual reports of the Egyptian General Petroleum Corporation (EGPC), and the Egyptian Electricity Authority (EEA). Activity data for the industry sector were obtained from the Ministry of Trade and Industry; Industrial Development Authority. Other data providers/sources have been the Ministry of State for Environmental Affairs (MSEA), Ministry of Agriculture & Land Reclamation, Ministry of Local Development, Ministry of Transport (MTR), Ministry of Economic Development, CAPMAS, IDSC and National Research Center. As for emission factors, in most of the cases default emission factors provided by IPCC 1996 and 2000 were used.

The major technical constraints faced during the GHG inventory process were related to the activity data gaps and use of IPCC default emission factors that do not reflect the country situation.

Inventory sectoral tables and IPCC worksheets were used in preparing the inventory presented by the SNC.

Most uncertainty analyses were conducted for the inventory presented in the SNC. According to the UNFCCC guidelines, parties are encouraged to conduct uncertainty estimates as given in the IPCC Good Practice Guidance. At least a tier 1 and tier 2 uncertainty analyses will be conducted in the TNC if possible. Also, no Quality control / Quality Assurance activities were done in the course of preparing the inventory presented in the SNC. A QA/QC plan will be developed in the TNC where appropriate.

Lessons learned in GHG inventory regarding identification of priorities and new areas for work under the TNC:

- Uncertainty analysis should be refined for key sources
- The energy sector should continue to receive the highest priority because of the impact of the sector on overall emissions and because of the influence of the sector on the national economy.
- The project should take advantage of work done in other projects, particularly the emission factors and methodologies covered in the Sustainable Transport project, and the Energy Efficiency (2nd phase) and Biomass projects being implemented under UNDP/GEF.
- There should be a comprehensive coordination between the relevant stakeholders on different levels to ensure incorporation of relevant policies and measures of each ministry into some sections of TNC
- There is a need to update and revise all details and assumptions made in order to have a better GHG inventory by improving data quality and access, having better inputs from more comprehensive national economic development parameters, and having more accurate assumptions for economic and demographic parameters.

- Training and capacity development of national experts and GHG experts team in the TNC project and GHG activity data providers in different ministries and national authorities using 1996 IPCC guidelines and GPG2000 guidelines is extremely important to expand the national base of experts in GHG inventory preparation.
- The GHG inventory team experts in TNC should begin using the 1996 UNFCCC to produce the common reporting format tables (CRF) and National Inventory Report (NIR).

Addressing the challenges facing preparation of GHG inventory: In order to address the challenges the following activities are planned:

- Establishing a National Inventory System (NIS) including the institutional arrangements, GHG data base, reviewing process, QA/QC planning etc.
- Coordinating with different information & data providers to sign MoUs for mutual cooperation with TNC team on a regular basis.
- Strengthening the capacity of national experts and expanding the roster of experts in GHG inventory preparation by conducting a series of sectoral training workshops on GHG inventory preparation according to revised 1996 IPCC guidelines and GPG 2000.

Mitigation Policies and Measures

Overall: some sectoral policies have been undertaken since the completion of the SNC that will affect emissions in the Energy, Transport and Industry sectors that have been identified as most important for the purposes of reporting.

Key Challenges

During the initial National Communications: Inconsistent or inappropriate methods, definitions, assumptions and data made analysis & comparison of results across parties difficult.

During the Second National Communication: Models remain relatively complex, making it hard for Parties to find suitable experts in-country to conduct these assessments. Reliance on limited number of national experts to meet NC obligations, poor documentation of data, methods, assumptions and results exacerbate the challenges.

Recommendations to address identified challenges

- Establishing a NIS including a GHG inventory Data Base
- Focus on CB &T of Nat. Experts in GHG inventory Preparation
- Conducting a Program for Capacity Building for NAMAs and LEDS
- Expanding the roster of experts GHG and NAMAs
- Mainstreaming of LEDS and NAMAs into National Development Plans
- Engagement of Private Sector and NGOs in NAMAs issues

Lessons learned in Mitigation Policies and Measures, identification of priorities and new areas for work:

1. Necessity for formulating, implementing, publishing and regularly updating national and, where appropriate, regional programs containing measures to mitigate emissions and assessing ongoing Projects in Egypt which have a direct impact on mitigating GHGs emissions
2. Training and capacity building for the national experts and members of the team in use of Models such as Long Range Energy Alternatives Planning (LEAP) model is extremely important since little national capacity exists in the use of such models. It is advisable to take the GHG inventory year 2005 as the starting point for the GHG analysis and the GHG abatement analysis should go up to 2025 - 2050.

3. Importance of strengthening the coordination with relevant ministries and other stakeholders at different levels to ensure the two-way flow of communication so that the relevant policies and measures of each ministry are incorporated into the PAMs section of the TNC.
4. Since no model is recommended to conduct abatement analysis for the waste sector, a spread sheet model will be developed to conduct the abatement analysis for this sector. Decision Support System for Agro technology Transfer (DSSAT) will be used to conduct abatement analysis for the agriculture sector.
5. The abatement analysis should focus on the identification of mitigation options relating to the most important future sources and sinks sectors, in addition to mitigation options identified in the SNC.
6. The list of abatement options proposed for the abatement scenario for each sector should be reviewed and updated in the light of new developments and needs. Key sources identified and updated under the GHG inventory exercise should be considered while making the selection of technology options. Quantitative estimates for emission reduction will be measured against the baseline scenario. To the extent possible, the economics and socioeconomics of the options should be considered at local scale (scale of governorates and province).
7. It is highly important to assess the challenging barriers along with the policy needs and actions just after selecting the abatement technologies that will be recommended from the abatement analysis that will be conducted in the course of preparation of the TNC
8. As a result of the barrier analysis, short and long term mitigation options should be recommended. Planned sector specific programs for mitigating GHGs will be investigated and reported in the TNC. Costs of implementation, a description of the mitigation potential, and environmental and social benefits will be reported as well. Moreover, a description of the constraints to implementation of these programs will be provided.

Conclusion

Accordingly, climate change risks may threaten Egypt's efforts to achieve the MDGs and to face those threats; INC & SNC presented several adaptation measures to climate change impacts, as well as many mitigation measures that play an effective role in achieving the main target of the UNFCCC.

The proposed TNC will build on the outputs of the INC, SNC and other relevant studies and national reports to identify priorities for interventions, and further translate assessments into concrete sector policies and measures. In this respect, the TNC will become a key tool for decision makers at all levels, and shall contribute to building capacity to establish a national inventory system for GHG and deepening understanding of the needs for and consequences of implementing mitigation policies and measures. It will demonstrate the potential contribution to the sustainable development of the principal economic sectors of Egypt, and help integrate climate change considerations into national sector policies and programs.

Finally, the project will contribute to enhancing general awareness and knowledge on GHG inventory preparation and mitigation policies & measures in Egypt, and will strengthen the dialogue, information exchange and cooperation among all the relevant stakeholders including governmental, non-governmental, academic, and private sectors in accordance to the Article 6 of the UNFCCC and Implementation of Buenos Aires Plan of Action.

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Ghana

Institutional Arrangement and Data Availability experiences under the GHG inventory System

By: Joseph Amankwa Bafoe, Environmental Protection Agency, Ghana

Introduction

As party to the UNFCCC, Ghana has successfully prepared its first and second national communications, in 2000 and 2011 respectively, to the conference of parties as stipulated in articles 4 and 12. The national communication process has helped in diverse ways in creating awareness on climate change in Ghana, building capacity among key stakeholders and above all contributed to informing policy decisions, particularly with regards to sustainable development. This has also contributed to the national effort of mainstreaming the national system for conducting the national communications on a regular basis in the future.

Ghana's preparation of the emissions inventories had been based on the application of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, as elaborated by the IPCC good practice guidance. The inventory covers five sectors namely: Energy, Industrial Processes (IP), Agriculture, Land Use Change and Forestry (LUCF) and Waste. The coverage of the latest inventory spans between a time series of 1990 and 2006 and for five direct greenhouse gases.

Arrangements under the existing national system are mostly built around individuals who make the system fragile and lack sustainability. Even though data availability is the backbone of every inventory, modalities for data accessing are mostly based on informal arrangements, with very little involvement of key stakeholders who generate the data. Improving the quality of the national GHG inventory can be beneficial as accurate inventories allow identification of major sources and sinks of GHGs with high confidence, and thus make more informed policy decisions with respect to appropriate response measures.

Experiences, Challenges and lessons of the National System for GHG Inventories

In Ghana, the institutional set-up includes: stakeholder institutions (such as government agencies, private and third party entities), their assigned roles and channels for data provision and management.

Institutional Arrangement under INC and SNC

In the preparation of Ghana's Initial (INC) and Second National Communications (SNC) to the UNFCCC the following institutional arrangement was followed. The Environmental Protection Agency (EPA) under the Ministry of Environment Science and Technology is the Lead National Institution (LNI) that coordinates all technical climate change activities including the GHGI. The Energy Resources and Climate Change Unit is the responsible office for coordinating the GHGI process. The Climate Change Focal Point chairs a technical review committee (TRC) that has oversight over the general direction of the greenhouse gas inventory preparation and compilation.

Under the arrangement, the EPA designated the Environmental Application and Technology (ENAPT) Centre, a private entity, to coordinate the implementation of the Greenhouse Gas inventory activities, (including the preparation of the inventory estimates, key source analysis, QA/QC, uncertainty management, documentation and archiving and preparation of the inventory report in Ghana.

An ad-hoc national inventory team, comprising experts from the various inventory sectors, was setup at the center. The individual sector persons conduct a complete inventory of GHG emissions by sources and removals by sink according to the IPCC guidelines and guidance. This arrangement was used because the climate change focal person due to capacity constraints used consulting firms to have the work done and this procedure was also used for the SNC. Because of this arrangement the process faced a lot of challenges and resulted in data and inventory preparation challenges.

For the coordinating center in the GHGI most data was collected in an informal manner which makes such arrangement unreliable. In cases where data providers incurred cost in generating data, the EPA is constrained in fully accessing the data.

Final GHG emission estimates, trends and key categories are presented to EPA for final general quality control and quality assurance (QA/QC) which assesses general correctness of the inventory-estimates, data choices, and emission factors and the consistency with IPCC guidelines and good practice guidance. First, an external review of the whole GHG by a third party in the country is done. The third party reviewers are selected from research and the academic institutions based on their requisite experience in the sector. International experts in GHGI undertake the second review if necessary. Regarding the SNC, the same process was used however; different individual sector leads were involved in the IP, Waste and Energy sectors.

Challenges with the institutional arrangement for GHG Inventory

In as much as the country has successfully conducted two GHG inventories, with marked improvements in the second inventory, there are a number of challenges with the current institutional arrangement. This is because the arrangements under the existing national system are ad-hoc and mostly built around individuals. Such an arrangement is therefore fragile and lacks sustainability in a sense that should any of the team members leave this would affect the system adversely.

Though there are institutions performing similar functions in certain phases of the inventory, these systems are not being tapped into, because there is no clear entry point where these institutions fit.

Data availability is the backbone of every inventory, however, due to the ad-hoc nature of the institutional arrangements under the current system, the modalities for data accessing are mostly based on informal arrangements, with very little involvement of key stakeholders who generate the data.

Data Management

The estimation of GHG emissions/removals per source/sink category is based on the methods described in the IPCC Guidelines, the IPCC Good Practice Guidance and the LUCF Good Practice Guidance. Data collection and processing constitute a large part of the inventory process. The process of checking the data and reformatting is important to ensure accuracy, completeness and consistency in the inventory and it is as equally relevant as emission factors.

Usually data is collected by the lead person for each sector and whatever data is collected sits with this individual and not even given to the consultancy firm because there is no formal agreement between the firm and the individuals to hand over the data. The only data obtained by the consultancy firm is the individual sector reports.

Data Challenges

Effective data acquisition and management for GHGI inventory is a major challenge to the estimation of quality GHGI in Ghana. Below are the various challenges faced during the GHG inventory preparation for the NC1 and NC2.

Generally, activity data exist in different forms and degrees of uncertainty.

- Country-specific data on emission factors are not available for almost all sectors. This results in wide use of default values (mainly emission factors) from IPCC guidelines and thus contributes to a major source of uncertainties in GHGI.
- The existing inventory data are also saddled with varying levels of quality across sectors; additionally some of the required data are non-existent.
- Unavailability of data is a challenge normally encountered during inventory compilation and National data in some category sectors is not readily available.
- Data providers usually restrict access to information because data might be confidential, unpublished or not yet finalized.
- Data is usually collected by organizations (data providers) for official work and not purposely for inventory work.
- Verification and cross checking of data is a challenge in some sectors. For example, in the industrial processing sector, the industries are the sole generators of the data and they do not publish their data.
- Data is usually archived in the respective agencies (Data Providers) either in soft or hard copy and in some instances data is available online. Most often data providers do not have the capacity for portal archiving and normally lose track of data archived over some period of years.
- Because data generation involves cost, owners more often raise issues of data ownership rights, data protection and extent of sharing.
- Emission data collection in Ghana is conducted on an “on demand” basis. Thus there is no obligation on the part of data providers to submit periodic returns to EPA and the designated national emission data coordination center.
- Inadequate data management system for GHG inventory in Ghana. GHG data archiving and dissemination in Ghana is largely inadequate.
- Insufficient capacity in the practices of collecting national GHG inventory data. Methodology is not in line with EPA/UNFCCC requirements, as raw data is not purposely collected for GHG inventory work. This affects the quality of quantitative assessment of the inventory in the key categorical sectors in Ghana. Available data is not properly collected and formatted for the purpose of GHGI in Ghana.

Revised institutional arrangement and Lessons from the NC Process

Given these challenges with the institutional arrangement and data generation, usability for GHGI and access by the inventory team, adequate channels are being developed for a more sustainable data generation and sharing framework. This framework goes beyond personal arrangements and relationships, to one that is grounded in statutory requirements, memoranda of Understanding (MoU), institutional mandates and possible legal structures. Data quality and format for the new national system is being designed such that the GHGI will be perceived more as a national activity with benefits for national development.

To address these issues, the new institutional design attempts to comprehensively improve upon the existing arrangement, which is generally ad-hoc and not backed by any formal collaborative mechanism. Additionally, in the existing institutional arrangement, inventory capacity and the overall coordination is extensively concentrated in most of the frontline agencies. The new institutional arrangement will seek to contribute to addressing the gaps identified in the existing

institutional arrangement by facilitating wider participation of major state and non-state agencies, having clear institutional roles and reporting lines and decentralizing the GHG inventory activities from frontline agencies to research, academic and partner sector institutions.

The GHG inventory system shall be modelled as Single National Entity (SNE) with the Environmental Protection Agency (EPA) being the designated national GHG inventory entity. The planning, preparation and compilation of sector inventories will be led by designated sub-task national institution. In all, five sector sub-task working groups will be formed and headed by a dedicated and competent institution.

The new institutional arrangement will be formulated in four (4) interactive hierarchical levels. At the top of the hierarchy, institutions will play oversight and a strategic role in providing direction of the entire inventory process as well as interface the inventory process with the national communication process. The Environmental Protection Agency (EPA), which has the statutory mandate for the GHG inventory will be singularly responsible for the overall planning delivery and reporting of the national process. The office of the UNFCCC focal point at the EPA will be responsible for the overall technical coordination.

Institutions will constitute the supervisory team. Each team member will be responsible for different component of the national inventory including, inventory compilation, QA/QC management, uncertainty assessment, generalist activities/international GHG specialist, national archiving and documentation.

These measures are to ensure that the inventory processes are firmly institutionalised in a way that ensures that the data collection system guarantees continuity and sustainability.

Institutional arrangement Overall NC process inputs for climate change integration

The existing efforts to mainstream the national system for the GHG inventory into key GHG inventory sector has been a major catalyst integrating climate change into the sector planning. To the extent that, under the third national communication, key line Ministries and Agencies will be conducting its own inventories. This a major institutional reformation to make sure that the inventory becomes efficient, timely and above all that it will serve as major input into sector planning. The efforts to achieve greater integration of climate change through the GHG inventory process are still fraught with challenges. Two of them keenly relate to how to realise sustainable funding from the national level as well as within the sectors; and lack of clear collaborative mechanisms which will underpin the effective operations of the institutions.

Ghana has also demonstrated its commitments to addressing climate change by adequately mainstreaming it in the latest economic development blue print. The upstream policy has been translated into several climate compatible interventions and actions in different facets of the economy and in high-risk agro-ecological zones. For example, the implementation of the Savannah Accelerated Development Authority (SADA) is expected to contribute to building adaptive capacity gaps in the savannah areas in Ghana. In addition to this, a number of initiatives are also targeted at measures, which would ensure low emission development. Climate Change is featured in the Ghana Shared Growth Development Agenda.

Ministry of MEST through the National Climate Change Committee is coordinating the development of a National Climate Change Policy (NCCPF). This policy will provide strategic direction and national framework to addressing climate change comprehensively in Ghana.

In addition, the preparation and reporting of this national GHG inventory is providing a number of other benefits to Ghana as well. These include among others:

- Provision of basic infrastructure for the development of low greenhouse gas emission growth plans

- Provision of useful information to economic development assessment and planning, such as: information on the supply and utilization of natural resources (e.g., croplands, forests, energy resources) and information on industrial demand and production.
- Provision of functional information for addressing other environmental issues (e.g., air quality, land use, waste management, etc.)
- Analysis and capturing of information on GHG emissions key category for effective prioritization and use of resources.
- Highlight and clarify national data gaps that, if filled, may be beneficial for other reasons, e.g., vehicle fleet data, national fuel consumption data.
- Provision of basis for evaluating GHG mitigation options and based on Ghana's national circumstances and pursues cost-effective emission reduction/enhancement efforts comprehensively.

Conclusions

The inventory system in Ghana has experienced substantial improvements since the Initial National Communications. Yet more needs to be done to achieve rigor and robustness. The major threats and challenges of Greenhouse Gas inventories (GHGI) in Ghana is that the existing institutional arrangements for the inventory is fragile and lacks adequate continuity, with substantial gaps in data management, national funding, as well as capacity development and retention. However, it is imperative that concrete mechanisms and systems are being put in place, in order to ensure a more sustainable inventory regime for the country, capable of responding to current and emerging requirements for National Communications and GHGI. Undoubtedly, the existing set-up under the NIS would function more efficiently if general and specific improvements are pursued in order to ensure more robustness, coordination and adaptability.

The improvements would be prioritized and targeted in areas such as institutional re-alignments, setting of clear roles and responsibilities among relevant institutions, general data management and would greatly open-up for effective coordination and mainstreaming.

Finally, with the compilation of the third national communication underway, it is expected that the new institutional arrangement being pursued would bring vast improvements in data access and methodologies for the overall inventory cycle for Ghana.

Macedonia

Good practices in the preparation of the Greenhouse Gas Inventories and V&A Assessment

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 Teodora Obradovic Grncarovska, National UNFCCC Focal Point, Ministry of Environment and Physical Planning
 Natasa Markovska, GHG Inventory Expert, Macedonian Academy of Sciences and Arts

Introduction

Responding to the obligations incurred by signing the UN Framework Convention on Climate Change (UNFCCC), the country submitted the First National Communication on Climate Change in 2003 and the Second National Communication in 2008. Preparation of the Third National Communication began in April 2012.

The preparation of the three national communications was financed by the Global Environment Facility (GEF). The Ministry of Environment and Physical Planning (MoEPP) is the National Focal Point for the UNFCCC and the key governmental body responsible for coordinating the

implementation of provisions from the UNFCCC and Kyoto Protocol. As the implementing agency, UNDP has supported national efforts to address and respond to climate change challenges by providing primary support in the development of the National Communications, an in-depth assessment of the potential socio-economic risks of climate change to the most vulnerable sectors, as well as comprehensive policy support for the establishment of the legal and institutional framework for the implementation of the Kyoto Protocol.

In the First National Communication on Climate Change emissions for the three main GHG were inventoried for the period 1990–1998 by applying the simplest method for emissions calculation. The inventory was subject to substantial national peer-review, but in fact the comprehensive technical review provided by the National Communications Support Unit (NCSU) proved crucial in generating better-quality inventories. In general, the GHG Inventory process for the First National Communication identified many data gaps and did not incorporate many of the good practices defined in the guidelines.

Within the Second National Communication, national GHG inventories were prepared for the years 1999–2002, including information on the other non-direct greenhouse gasses. Additional efforts were made to improve the quality of the inventories, resulting in more accurate time series for 1990–2002. Tier 2 methods were partially applied in the Energy sector as a key source. The review of the inventory by the national counterparts demonstrated a systematically improved inventory prepared according to the guidelines within the limitations of the national circumstances. Enhanced regional cooperation and in-depth technical assessment provided by the National Communications Support Unit provided added value, however, in creating an enabling framework for the preparation of GHG inventories in the country. Active participation in the regional project aimed at improving capacities of national GHG inventory teams, resulted in enhanced capacities for implementation of some good practices into the national GHG inventories, such as key sources analyses, QA/QC procedures, and uncertainty management.

The preparation of the GHG inventories for the First and Second National Communications was coordinated by the Research Centre for Energy, Informatics, and Materials of the Macedonian Academy of Sciences and Arts (ICEIM-MANU). During the preparation of the Third National Communication it was decided to test a new institutional arrangement for upgrading and maintaining the GHG Inventory in order to strengthen the institutional capacities of the MoEPP, as well as to ensure the sustainability of the project results upon its completion. For this purpose, three professionals were engaged to prepare the inventories with support from a technical expert from ICEIM-MANU. The GHG inventories for 2003–2009 should be finalized by the end of this year. Tier 2 will be applied for the energy sector, which accounts for about 70% of total emissions.

Main lessons learned from Macedonian experience

The recommendations from previous national communications suggested the need to improve the GHG inventory, fill out data gaps and improve activity data. Since then, considerable progress has been achieved, particularly in the inventory process itself. Notable results include improvements in the following areas:

- the technical capacity of the inventory team
- communications with data sources and other stakeholders
- Quality Assurance/ Quality Control procedures
- documenting and archiving
- regional cooperation
- obtaining more reliable data series for GHG emissions.

The first good practice in preparing national GHG inventories is to structure the national GHG inventory team (Figure 1) in such a way as to enable the maximum possible extent of control and quality assurance of the input data and estimated emissions. The national GHG inventory team thus involved the following entities:

- **The Ministry of Environment and Physical Planning**, responsible for supervising the national inventory process and reporting the emissions to UNFCCC
- **The National Institution (ICEIM-MANU)**, responsible for coordinating and supervising the preparation of inventories
- **The Sectoral Experts** (two experts for each sector):
 - the **Enterer**, responsible for identifying/verifying data sources, entering and documenting the input data
 - the **Checker**, responsible for checking and validating the input data and emission estimates

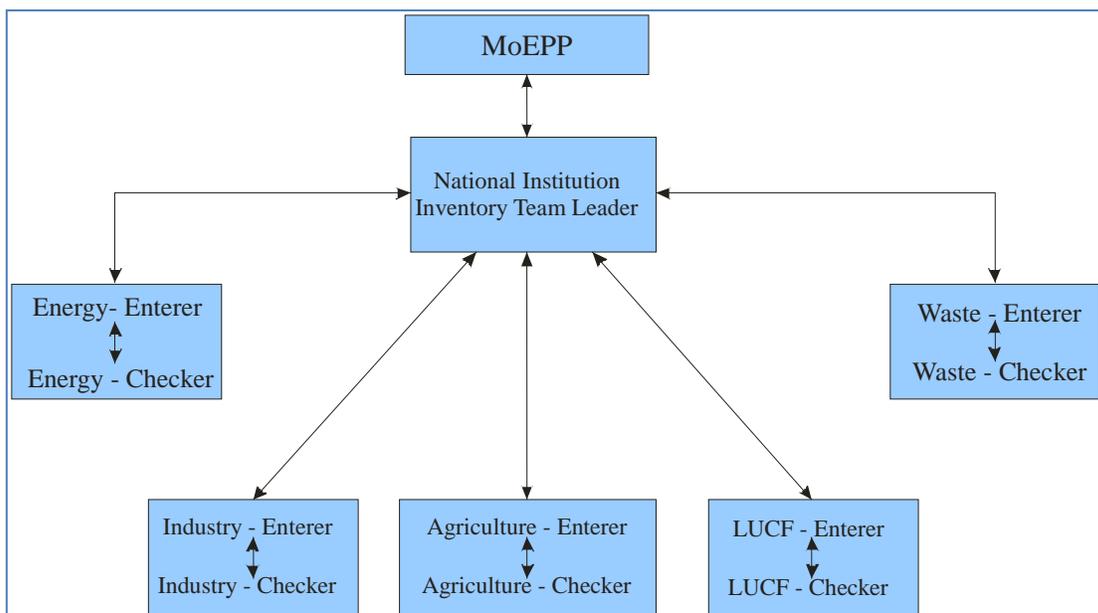


Figure 1: Structure of the national GHG inventory team for the Second National Communication

The *enterer* works in parallel with the checker on filling values for activity data and emission factors in the IPCC database and the Documenting tables (Figures 2 and 3). The checker is in charge of the validation of the input data. The checker reviews all the activity data and emission factors and either confirms their correctness by checking the corresponding validation field in the Documenting table or signals any irregularities. In case of detected errors, both sectoral experts perform a recalculation of emissions in order to reflect the corrective actions and prepare a validation report confirming the accuracy of the input data and emission estimates, as well as to confirm that the adopted procedures for inventory compilation have been appropriately implemented. For the purpose of ensuring uniformity and consistency in reporting, a template of the Documenting Table was created by the ICEIM-MANU and provided to the sectoral experts. Documenting table should be filled-in for each activity data and emission factor. Full inventory documentation has been developed for the base year (2000).

This documenting procedure might appear to create additional paperwork; however, it resulted in a more reliable time series of high quality inventories and serves as national training material for the preparation of future GHG inventories in the country. This good practice was confirmed during the preparation of the GHG inventories for the Third National Report. Despite the fact that a new institutional arrangement was established to assure continuous and regular updating

of the national GHG inventories (as described in the introduction), the new GHG inventory team were able to continue their preparation of the new inventory without difficulty on the basis of the documenting tables. In order to provide consistency in preparation of GHG inventories, the database is stored in the Ministry of Environment and Physical Planning.

Data enterer	<i>Name of the person who enters the data</i>
Date	<i>When is the data entered?</i>
Type	<i>Activity Data or Emission Factor or Conversion Factor</i>
Unit	
Value	
Reference	<i>Where is the data taken from? Title of publication, page number; Expert estimation. Who did the estimation (provide contact details!)? Based on what?</i>
Uncertainty (%)	<i>Assessed level of data uncertainty</i>
Comment	<i>Additional information and proposals for improving the data`</i>

Figure 2: Template of Documenting Table

Data checker	<i>Name of the person who checks the data</i>
Date	<i>When is the data checked?</i>
Comment	<i>Detected errors; Proposal for corrective action</i>
Validation field	<i>X- if some error is detected ✓ - if all AD/EF characteristics are OK</i>

Figure 3: Template of a Verification Table

The other good practice presented in the preparation of GHG inventories in Macedonia is the use of the *Monte Carlo* method, which is the Tier 2 method for estimating uncertainties. The Monte Carlo analysis can be performed at the source category level for aggregations of source categories or for the inventory as a whole. Due to uncertainties in the results, not all of the requirements for successful implementation of the Monte Carlo analysis are met for all source categories within the Macedonian GHG inventory. Therefore, estimation of the uncertainties has been conducted only for the Sectoral Approach of the Energy Sector, applying the software package Simulacion 4.0 (<http://www.cema.edu.ar/~jvarela>). The mean value and standard deviation for each variable were defined, i.e. the values of 10% for the activity data and 5% for conversion and emission factors were set. The total uncertainty for the whole Energy sector obtained by the Monte Carlo simulation is 8.45 per cent.

In order to confirm the results of the uncertainty calculation with the Monte Carlo simulation, uncertainties were calculated with the Tier 1 method for the whole Energy sector. The total uncertainty for the whole Energy sector calculated by the Tier 1 approach is 8.44 per cent, which is practically the same as the value obtained by the Monte Carlo simulation, thus confirming that the simulation was properly carried out.

Main challenges – the Macedonian experience

The preparation of GHG inventories still suffers from several issues and problems affecting its quality. The general problem is that of data availability and the discontinuity of the time series in

cases where the data does exist. The results and findings therefore include a great range of uncertainty, since in many cases expert judgment was used in the absence of the necessary data.

As a step towards improvement, a report has been prepared which identifies some of the missing data, supported by template forms that will help national institutions in the collection of data, thus allowing for the development of more extensive and reliable databases. Improved databases will enable the application of more sophisticated methodology for obtaining emission estimates in future national communications. It is crucial that those national institutions which are obliged to collect data become more deeply involved in order to make adjustments in the data collection methodology.

Several improvements have been introduced during the preparation of the Third National Communication. The National Climate Change Committee was revised to include all relevant institutions in order to ensure the active participation of all stakeholders in the preparation of the national communications. Direct communication with specific industries has proven the best possible way of enabling the application of Tier 2 to some sub-sectors—most of the installations have the needed data, but are not required to report this data. Close cooperation with the Chamber of Commerce as a representative of the national economy was of additional value in the preparation of more accurate inventories.

Data gaps were identified for each sector and recommendations for improvement in the GHG Inventory were suggested in order to create enabling environment for establishment of national system on GHG inventory data collection. The GHG team also actively coordinates with other donors/projects working in the areas of mutual interest in order to enable consistency of results and recommendations related to creating sustainability of the process for preparation of GHG inventories. Targeted workshop for all relevant stakeholders will be organized in order to prepare an action plan stipulating modes and methods for collection and management of data needed for GHG inventories. Based on the recommendation, possible related changes in the secondary legislation will be prepared.

The main responsibility for data collection lies with the Ministry of Environment and Physical Planning, which should initiate and coordinate activities to ensure closer cooperation for mutual benefit among all interested parties, including the State Statistical Office, the Ministry of Economy, and the Ministry of Agriculture, Forestry and Water Supply. This would improve institutional cooperation in terms of data and information exchange, recognized as one of the key areas in need of improvement to ensure the smooth and successful preparation of GHG inventories.

The main challenge for the preparation of GHG inventories is the sustainability of the process. It should be noted that the inventory system outlined above was project-based, established for the purpose of compiling the national GHG inventories as part of the National Communications. The Law on Environment (*Official Gazette 53/05, 81/05*) provides the legal framework for the development of a National Inventory. As stipulated in this Law (Article 188, paragraph 3), the Minister of Environment and Physical Planning, as the managing body of the state administration responsible for the affairs of the environment, shall prescribe the details as to the conditions, manner and procedure for preparing the GHG Inventory. The National Inventory shall be prepared once in three years (Law on Environment, Article 188, paragraph 4) and shall be an integral part of the National Plan on Climate Change (referred to in the Law on Environment, Article 187). In order to ensure sustainability in the upgrading and maintenance of the GHG Inventory, a process of transferring knowledge and experience has begun by increasing the capacity of three new employees in the Ministry of Environment and Physical Planning. National capacities will be further strengthened through EU-funded projects under IPA.

The integration of recommendations from the National Communications within national policy on climate change

Previous national communications in the country have served as a trigger for all other strategic and policy documents and research related to national development priorities. Coordination is essential between all stakeholders working in the area of climate change to create synergies and send out coherent and consistent messages. The revised National Climate Change Committee will have the leading role in providing analytical and institutional capacity from the key national institutions to integrate climate change priorities into country development strategies and relevant sector programmes.

Building upon previous work that analysed the physical impacts of climate change in the country and recommendations given in the Second National Communication, several examples of climate change integration are offered below that will further help the country to comply with its obligations towards the UNFCCC and to be better prepared for negotiating the climate change chapter with the EU:

- Macedonia has associated to the Copenhagen Accord and submitted its reduction targets and a preliminary list of mitigation actions (without quantifying the associated emission reductions) based on the action plan developed as part of the Second National Communication.
- A number of national documents setting policies for the development of key sectors have been adopted, including the National Strategy for Sustainable Development; the National Environmental Investments Strategy and the National Environmental Approximation Strategy; the Waste Management Strategy and the National Waste Management Plan; the Strategy for Energy Development in the Republic of Macedonia for the Period 2008–2020 with a Vision to 2030; the Renewable Energy Sources Strategy of Macedonia to 2020; and the National Strategy for Energy Efficiency in the Republic of Macedonia to 2020.)
- A significant study developed by UNDP–*Assessing the Economic Impact of Climate Change: National Case studies*—has been published, investigating the economic impacts of climate change in three major areas: the energy demand for heating and cooling, the water resources related to electricity production, and agriculture. The study represents a major breakthrough in moving towards a more climate-resilient path.
- A roadmap for the introduction of Monitoring, Reporting and Verification of GHG emissions under EU ETS is currently under preparation
- A Law on Climate Change is envisaged to be prepared under an IPA project 2012–2014, which will establish the legal basis for transposing relevant EU legislation arising from climate “acquis”.
- The World Bank’s Green Growth Program and Climate Change Analytic and Advisory Support Program are assessing the economic costs and benefits of a shift to greener growth, taking into account projected climate change.
- The adoption of country-specific national emission factors and the harmonization of both IPPC and CORINAIR methodology is underway, adding value to the development of GHG inventories in terms of using higher Tier methodology.
- The Government has adopted a National Strategy for Climate Change Adaptation in the Health sector.
- A National Strategy for Climate Change Adaptation in Agriculture is under development.
- Most of the relevant ministries have nominated Climate Change Focal Points.

Conclusions

There has been notable progress in the country's institutional and policy frameworks for dealing with issues related to climate change since the First National Communication. There is still much room for improvement, however, in making more effective use of the results from relevant national activities related to climate change issues and in fulfilling the country's commitments under the UNFCCC and the process of EU accession:

- A more sophisticated GHG inventory will contribute towards providing a background for the establishment of a national registry system, which will be requirement in the process of EU accession.
- A number of institutional and legislative measures need to be undertaken to further develop national capacity for archiving and updating the GHG inventory.
- Based on the recommendations in the Roadmap for introduction of Monitoring, Reporting and Verification system in the country, in order to strengthen capacities of the GHG team, Macedonian consultants working on the preparation of the GHG Inventory were nominated by the UNFCCC National Focal Point in the UNFCCC Roster of Experts for review of annual inventory submissions.
- For mutual benefit, it is necessary to ensure linkages between the GHG inventory and other inventories/cadastres of pollutants and polluters, such as the Air Pollutants and the Cadastre of Polluters.
- Synergies between the UNFCCC and the relevant EU Directives should be explored, as well as possibilities for harmonizing the country's reporting obligations, in order to increase national capacities for participating in international negotiations on climate change issues.
- The capacities of central and local authorities need to be strengthened to enable them to further integrate environment and disaster risk-reduction within national and local development frameworks.
- A participatory governance assessment should be conducted to look at both the structures and stakeholder engagement mechanisms for climate change management that are needed to meet UNFCCC and EU requirements, with a particular emphasis on local level.

CHAPTER III VULNERABILITY & ADAPTATION ASSESSMENT

According to some of the papers, one of the most challenging chapters of the NC was the vulnerability assessment. Generally this was due to a few reasons, but one of the more prominent was the low technical expertise available for detailed climate change assessments and also due in some cases to poor coverage and quality of climate observation and records.

Another issue not usually reported is the difficulty of selecting methodologies for the processing and presentation of the observed and assessed climate change.

Countries have also highlighted that in order to avoid discrepancies in data that could lead to difficulties when the time comes for implementing adaptation actions at regional and local level it is important to update the existing guidelines for V&A assessment or produce new guidelines that could be useful to a wider range of audiences.

Another issue brought up in the papers is the stability of the NC team. Giving the time elapsed between the INC and SNC most of the NC teams were dissolved, and it was difficult to find appropriate experts that will integrate the SNC technical teams. The SNC process showed that it is vital for the continuity of the process to keep the team together as a way of preserving the institutional memory. For this reason attention should be given to building the capacity of public institutions, instead of contracting the work to outside experts-contractors.

Another issue raised by the NC is the importance of linking climate change, DRM and development since this is fundamental for the formulation of long term adaptation measures/strategies. Also some of the papers advise the necessity to include indigenous knowledge, alongside the need for good, reliable, sector-specific data in the analysis and during the process of identifying adaptation options and/or strategies.

The following countries are depicted in this chapter:

1. **Bangladesh's** Experiences on GHG Inventory Preparation and Climate risk and V&A Assessment
2. Country Experience in Vulnerability and Adaptation Assessment for **Bhutan's** Second National Communication to the UNFCCC
3. **The Cuban** experience regarding vulnerability and Adaptation assessment, the impact analysis and on climate change adaptation.
4. **Eritrea** : Vulnerability Assessment, Methods and Tools for Cross-sectoral Impact Assessment
5. **Kyrgyzstan's** lessons learned and recommendations for V&A assessments
6. **Nepal:** Climate Risk, Vulnerability and Adaptation

Bangladesh

Experiences on GHG Inventory Preparation and Climate Risk and V&A Assessment

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Introduction

In the Initial National Communication of Bangladesh the focus was on emission inventory and the impact and vulnerability of climate change on different sectors and bio-physical systems. The Second National Communication (SNC) provided an updated status of emissions elaborating a GHG inventory along with the studies on vulnerability of the country to cc along with impact studies on new sectors, and also included new adaptation and mitigation studies and other cross-cutting. The SNC has been able to create a solid foundation for further work on scientific and policy issues.

During the implementation period of the SNC project the policy makers were alerted to the need for mainstream climate issues to play an increased role in the national policy and its legal framework. The national communication process has helped to enhance the capacity of the scientific and research communities of Bangladesh in formulating and planning mitigation and adaptation policies and options. The project has further highlighted the need for stronger efforts to raise awareness among stakeholder groups and decision-makers. Partnerships with Government, NGOs and civil society organizations have been strengthened by organizing different meetings and workshops and by providing substantial research and policy oriented advice.

Activities undertaken during the Second National Communication

During project period 11 Consultative workshops and 9 discussion meetings were held on National Circumstances, Greenhouse Gas Inventory, Programmes containing measures to mitigate climate change, as well as programmes containing measures to facilitate adaptation to climate change and other cross-cutting issues where officials from various government ministries, offices, NGO workers, teachers from different universities, members from private and research organizations and civil society participated.

Through these consultative workshops and meetings the experts and participants evaluated the progress of the activities and provided comments/suggestions to fill up the constraints and gaps of the components and upgrade the contents of the GHG inventory, mitigation strategies and V& A assessment of the SNC.

Interaction with the stakeholders convinced the government officials, development planners, NGO workers and policy makers to formulate mitigation and adaptation plans for coping with climate change impacts and climate change induced disasters in Bangladesh. The outputs of the project have provided necessary information on climate change impacts. Thus, the SNC project tried to play a significant role in supporting the government in integrating climate change concerns into national policies, projects.

In addition the partnerships between the government, non government and private organizations have been developed and strengthened through data and information sharing, technology transfer ideas, information and institutional capacity building activities.

The progress and achievements of the project were also monitored and evaluated by the project authority, National Steering Committee, National Technical Advisory Committee and Core-Sectoral Working Group members, as well as other stakeholders. A good number of consultation/review meetings were held to upgrade the quality of the reports. These efforts helped meet anticipated outcomes of the project activities. Five Draft reports on 5 components of the SNC were prepared during January-April 2011, and were reviewed by 5 National Consultants (Peer reviewers). The consultants prepared the final reports according to the comments, observations and suggestions of the peer reviewers. The 5 final reports were then compiled by a national consultant and the main report "Second National

Communication of Bangladesh to the United Nations Framework Convention on climate Change (UNFCCC)” has been prepared with an Executive Summary.

Experiences on GHG Inventory Preparation

The SNC project has prepared an updated GHG emission inventory for 2001 as well as 2005.

- Sectors covered: (a) Energy, (b) Industry, (c) Agriculture, (d) LULUCF, and (e) Waste,
- Activity data for the above sectors procured for the years 2001-2005,
- Bangladesh specific activity data procured for all sectors. Bangladesh specific emission factors determined and used for sub-sectors Manure Management in Agriculture Sector and sub-sector Solid Waste in Waste Sector. In other cases, either regional emission factors or IPCC 1996 Guidelines emission factors adapted to Bangladesh conditions were used.

Challenges in GHG Inventory

The GHG inventory faces a number of problems, the most significant of which is the non-availability/incomplete availability of activity data in all sectors. Training programmes and media publicity have to be undertaken to popularize the importance of storing activity data for the sake of better health, more profit and a more environmentally-friendly atmosphere.

Another uncertainty is the non-availability of local emission factors. Although in SNC reports, emission factors for manure management and municipal solid waste have been calculated, local emission factors for other sub-sectors are yet to be determined. Comparison of local emission values with the IPCC shows a significant difference between the two values. This introduces large uncertainty in the emission calculation. Efforts will be made to develop methane emission factor for cultivated rice fields and enteric fermentation of livestock during preparation of the TNC.

Most of the custodians of activity data are not aware of the formats in which activity data are to be stored. Some custodians of data are reluctant to supply data owing to confidentiality issues. The government should make it mandatory for all the data custodians to provide the required data in a proper format that is commensurate with the data requirements for preparations of national GHG inventories.

When the national team members faced problem in collecting activity data from various institutions, they informed the project manager about the problem and requested necessary assistance. The project authority then communicated with the concerned institutions and explained the importance of their data and requested the required data from the national team in the sake of national interests. As a result the institutions provided the required data to the national team. Thus the problems were solved. In addition, training courses were conducted for the custodians of activity data, technicians and officials who are working in the Agriculture, Livestock & Enteric fermentation, Land use change and forestry, and Municipal solid waste management sectoral offices in the divisional head quarters and district towns to enhance their understanding on GHG Inventory and mitigation and capability for storing data in proper formats.

Lessons Learned

The SNC Report (GHG Inventory) contains high uncertainties exist in some of the reported results of many sub-sectors. Consequently it is recommended that necessary steps should be taken in future communications to reduce these uncertainties. In most cases 1st tier IPCC default emission factors have been used, which do not always match with the country situation. In this respect, the local emission factors need to be developed in order to ascertain a higher degree of accuracy with regards to the emission inventory. The stakeholders’ awareness needs to be increased through training so that they are freely able to offer the required activity data. The accuracy of the secondary data may need to be verified and confirmed against the data collected through reliable survey using trained manpower and valid methodologies.

There is a severe dearth of activity data in the forestry sector. A survey is needed to collect data that fits with the National Communications and Guidelines of IPCC. Throughout the preparation of the GHG Inventory there was a lack of relevant and quality data in some sectors. To remedy the problem, there should be a continuous data collection and knowledge management system and the relevant databases for use in NCs should be developed as well, as these could also help with other climate development purposes. Development of trained manpower and institutional capacity building appears essential for generating the reliable emission inventory.

Constant cooperation, supervision and collaboration among the professionals of the project, different concerned institutions, experts of different committees, national team members and other stakeholders are essential for timely and efficient execution of the project activities.

Experiences on Climate Risk and V&A Sectoral Assessment

Natural disasters cause an immense effect on sectors like agriculture, fisheries, livestock, forest and ecosystem, infrastructure etc. Climate change will further aggravate those effects. The vulnerability of these sectors is interdependent and ultimately impacts many lives. To understand the cumulative impact of climate change on different sectors and the individuals dependent on each, the link between livelihood development and cross sectoral issues of climate change, an assessment of adaptation processes should occur. This will provide knowledge on how the climate change impacts and adaptation practices can support the livelihood development in a more efficient manner.

In the SNC, impacts on water availability (including sea level rise, rice and wheat production, fisheries, livestock, human health, ecosystem and forests, infrastructure and urban area) have been estimated using various models. All such models have their own uncertainties based on assumptions of parameters as well as assumed relationships among numerous variables which may or may not be applicable in Bangladesh. The margin of error in each case remains unknown. If it is large, adaptation measures may be ill-suited, and even cause mal-adaptation.

The SNC vulnerability analysis was also done. However, there was a lack of analyses of climate change, mitigation, and adaptation measures. For this, a number of modelling exercises have to be undertaken and continuously improved. In this regard, a substantial up scaling of capacity at various levels and institutions including formal educational programmes at higher education level should be undertaken.

Bangladesh needs to raise awareness about all aspects of climate change and build technical and institutional capacity through the acquisition of modern technology, proper training, knowledge sharing, disseminating data and information, regional and global cooperation to enhance human ability to adapt to the impacts of climate change.

Challenges & needs

Though the general trends of climate variability are known and impacts are experienced, certain details with regard to micro-level analyses of climate variability for different months of the year and their impacts on various sectors especially on water resources and agriculture has not yet been performed.

Future scenarios are available for the winter and the summer, but this is not adequate to analyze the impacts on agriculture, where monthly scenarios are necessary.

In the coastal zone, the sedimentation dynamics over the tidally flooded regions and the rate of annual deposition due to tidal impacts and deposition by storm surges have not been studied yet. These studies should be performed.

The future climate projections by the GCMs are available on a monthly, as well as seasonal, basis. The data from GCMs and RCMs are of 1 terabyte in size, which means they require an extended period of time to procure. Further, assessment of impacts on the individual sectors was challenging due to a lack of user friendly long term observed data and climate forecasts. A lot of tools are available internationally for different sectoral impact assessment, but localisation of them is a challenge due to limited research

technology knowledge on local conditions. Compiling and synthesizing the acquired knowledge on the climate change impacts on livelihood was the major challenge. The prioritizing of the adaptation tasks and funding for the adaptations were also revealed to be highly challenging, because climate change impacts are of an interdisciplinary nature, which makes the system difficult for programming multi-disciplinary interventions.

Other Lessons Learned

Climate change is already impacting the overall development efforts in the country. It threatens to undermine development achievements and slows progress towards the achievement of the millennium Development Goals (MDGs), especially those dealing with hunger and poverty reduction and ensuring environmental sustainability. The agriculture and forestry sectors are central in this regard because they are not only affected by climate change and contribute to greenhouse gas (GHG) emissions but also offer opportunities for cost-effective mitigation options with additional benefits for development and food security. Besides, energy, industry and waste sectors also contribute to GHG emissions. Hence, with appropriate planning, mitigation initiatives and climate change adaptation can be integrated into sustainable development initiatives resulting in mutually beneficial outcomes.

Programmes containing measures to mitigate and facilitate adaptation to climate change should be disseminated among all the stakeholders to reduce the vulnerability, to attain the sustainability of the country and to efficiently combat the menace of climate change.

Bangladesh needs to strengthen the coordination, networks and information flows between ministries, different levels of government and civil society to have a more efficient integration of climate change variables into poverty reduction and development strategies.

Inputs of NC process for climate change integration

The NC process has generated important base line data required for the assessment of climate change vulnerability and impacts and adaptation options. It has also resulted in a comprehensive vulnerability assessment for various sectors, in particular agriculture, forestry and regions based on certain assumptions. The SNC suggested a range of policy options for adequate monitoring systems and response strategies for climate change impacts on terrestrial and marine ecosystems.

The project has helped in identifying institutions that have the capacity to be involved in issues related to climate change impacts and to adopt appropriate arrangements to address those impacts. More importantly, the SNC project has helped the Government of Bangladesh and other stakeholders understand the consequences of climate change scenario in a highly vulnerable country that is heavily dependent on an agrarian economy.

As national capacity building is an important aspect for climate change research, formulation of mitigation, adaptation and response strategies, policy formulation and planning and implementation of the mitigation and adaptation policies and options, the institutional capacity has been built in the Department of Environment and other institutions by providing training on different activities of the Second National communication Project.

The SNC project generated adequate interest in policy evolution on climate change and the integration of climate change related issues with concerned sectoral planning. It has also identified a number of future plans of action and policy measures to save Bangladesh from the adverse impacts of climate change.

It should be mentioned that data and information of the Draft SNC are being used by different government, non government and private organizations for their development projects related to climate change and sustainability of the country. Data and information of SNC are also being used by the Bangladesh Climate Change Negotiation Team for national, regional and international negotiation purposes.

The SNC will guide the government officials, development planners, NGO workers and policy makers to formulate mitigation and adaptation plans for coping with climate change impacts and climate change induced disasters of Bangladesh. The lives and properties of the people will ultimately be saved and the sufferings of the livelihood will be relieved and the general people of the country specially the women, children and the marginalized group will be benefited from the project outputs.

Way Forward-Future Strategic Directions/ Recommendations

The workshops and meetings organized by the SNC project provided opportunities to learn various aspects of climate change and helped to develop and maintain a network among the policy makers, professional groups, scientists, government officials, civil society groups and other stakeholders for knowledge sharing and disseminating data and information for better understanding and implementing various tasks and projects related to climate change.

Programmes containing measures to mitigate and facilitate adaptation to climate change of SNC should be disseminated among all the stakeholders as this document can be treated as a very important and valuable exercise in our ongoing efforts to protect the global environment while working to achieve our national sustainable development goals.

Copies of the SNC will be distributed among the policy makers, officials of government, non government, private and research organizations, journalists of printing and electronic media and other stakeholders of the country.

Activities for preparing the Third National Communication have already been started. More workshops and trainings on different components of the TNC will be organized to create new partnerships for benefiting more people, community and stakeholders from different socio-economic sectors. Programmes will also be undertaken to generate awareness and educate more people in the academic levels on climate change issues.

As adaptation to climate change requires a large budget, developed countries should provide enough funds to Bangladesh and other poor countries to adapt and combat the menace of climate change and make climate resilient development in all spheres of life in these countries. At the same time efficient coastal zone management programs should be undertaken to arrest coastal erosion, water resources deterioration and protect agriculture, and fisheries from adverse impacts of climate change and sea level rise.

Conclusions

We know that Bangladesh is one of the most climate vulnerable countries in the world and will become even more so as a result of climate change and its associated risks. Although the Bangladeshi government has integrated climate change in its planning process, it is now essential that using the SNC data and information and programmes containing measures to mitigate and adapt to climate change, Bangladesh undertakes required adaptation measures in order to increase countries' resilience in areas like: health and social systems; agriculture, biodiversity and ecosystems; production systems and physical infrastructure, including the energy grid and also undertake clean development path to contribute fulfilling global goal of the reduction of green house gases emission and to provide access to cleaner energy to all the population.

Thus the Second National Communication of Bangladesh can be considered to be a national planning document that addresses critical climate change issues at a national level, and which has the potential to attract financial resources to support the implementation of the Convention.

Bhutan

Experience in V&A Assessment for Bhutan's Second National Communication to the UNFCCC

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Introduction

Bhutan is a small, landlocked, Least Developed Country located in the eastern Himalayas with a population of around 700,000. While the land area is relatively small at 38,394 sq km the mountainous landscape results in complex climate types and ecosystems ranging from sub-tropical forests at an elevation of 100m to alpine pastures and snow capped peaks over 7000m. These economic and geographical situations present numerous challenges for the socio-economic development efforts of the country. Climate change has now become a matter of great concern and Bhutan has already started implementing several adaptation activities under the National Adaptation Programme of Action (NAPA)

The Initial National Communication (INC) from Bhutan introduced the theme for the first time to most people in Bhutan, including sectoral experts, which did not hear about climate change, let alone attempted to conduct climate change assessments.

The INC had focused mainly on the Greenhouse Gas Inventory as the national team was unable to conduct a vulnerability assessment due to the above mentioned difficulties. With almost a decade between the INC and the Second National Communication (SNC) projects the national team determined that there had been some improvement in data and capacity in the interim to conduct a relatively more thorough assessment for the SNC. It was with this understanding that the SNC project included additional chapters on mitigation assessment and also on vulnerability and adaptation.

With regard to the SNC, one of the most challenging chapters was the vulnerability assessment. While low technical capacity in general exists in Bhutan, expertise for detailed climate change assessments was particularly acute. Poor coverage and quality of climate observation and records presented a challenge for the SNC team. The complex mountainous landscape presented further complicated matters for climate modelling and vulnerability assessments. The experience of the national team in trying to produce the first elaborated V&A Assessment despite these circumstances is described in the subsequent sections of this paper.

Challenges during the Vulnerability and Adaptation Assessment

Data and information gaps

The climatic data was still not adequate since historical records available were only for the past 20 to 25 years and large informational gaps remained about the high mountain regions in the north and the interiors of the country. The quality and reliability of the records was also questionable for many stations so the NC team cleaned up data sets and selected datasets with acceptable records, although this process reduced the coverage of climatic data for the country. However, the national team decided to use what was available denoting the limitations that would be present in describing current climate trends and also for validating the models.

Technical constraints for Climate Change Scenarios and South-South Cooperation

Although capacity, technology and data availability had improved somewhat since the INC, the conditions in Bhutan with regards to capacity or technology was still quite under-developed. There was no full-fledged meteorological agency at the time of preparation of the SNC and still no trained meteorologists. The capacity for vulnerability assessments was limited as most experts had not dealt with climate change as a factor in their day to day work within their own sectors. So, without adequate technical capacity within Bhutan, the SNC project team sought assistance from outside the country to

assist and at the same time provide some capacity building for climate modelling and vulnerability assessments.

The SNC Project requested technical support of the South East Asia Regional START Regional Center (SEA START RC) based in Chulalongkorn University, Bangkok, Thailand in developing climate scenarios for Bhutan. The assistance had the objective of capacity building in climate modelling and also assisting in developing climate scenarios for Bhutan using PRECIS. Given the relatively low awareness level on techniques for climate change assessments, the technical assistance was designed to start with a general awareness workshop on climate modeling and vulnerability assessment for stakeholder groups in Bhutan. This was followed immediately by a hands-on training on climate modeling using PRECIS for smaller group of experts from hydrometeorology, educational institutes and the agriculture and environment sectors. To reduce glitches and to provide continued support to the end of the assessment, the assistance also included follow up training session for a small group from the project team, in analyzing the outputs of PRECIS, after the models were run for a couple of months. A couple of troubleshooting visits to Bhutan were also scheduled for experts from START RC as required during the process. During the climate modeling phase, the SNC Project purchased one high end desktop computer and an Asian Development Bank's capacity building project for the National Environment Commission also contributed a second desktop computer.

Selecting an appropriate Climate Model

Most climate models have a coarse resolution whereby only one cell is used for the whole of small countries like Bhutan. The highly mountainous topography of Bhutan also makes it more difficult to use climate scenarios. After consideration of various approaches for modelling and tools available, it was decided that PRECIS regional climate model was the most appropriate for Bhutan. PRECIS had high resolution, very low resource requirements and also considered elevation of the land to address the mountainous terrain problem to some extent. The software was freely available for Bhutan as a developing country and computing requirements were only for high-end desktop computers. Two climate scenarios under A1B emission scenarios namely ECHAM5 and HadCM3Q0 with assistance of the SEA START RC were modelled at 25km resolution which is the highest resolution available at this time

Capacity for Vulnerability Assessments

The resources and time available in the SNC did not adequately cover the capacity building needs required to fully address the gaps for the various assessments, especially for the V&A as highlighted in previous sessions. The full commitment of national task force members is also quite variable since the Natcoms are not part of their day to day tasks or jobs. Therefore, the SNC Project hired international consultants through an open international bid to assist in conducting the vulnerability assessment and also in providing capacity building.

However, a national task force was formed to oversee the technical vulnerability assessment to ensure country ownership and relevance. However, since the vulnerability assessment would use quite advanced techniques that the sectoral experts were not familiar with, the TOR for the consultant included a short training session for the national task force members on vulnerability assessment and an introduction to the various tools. The tools and approaches included GIS based methods, DSSAT crop modelling, WEAP for water impact assessment, and Net Basin Supply assessment for hydropower impact assessment. The sectoral experts provided the relevant inputs such as data variables, expert opinion and suggestions and the technical assessments were carried out by the consultants. Continuous communication for clarification, provision of additional information and comments were provided by the task force members based on the information and results provided by the consultants.

The final adaptation planning exercise was carried out by the national team based on the information from the technical V&A results of the consultants, the results of the NAPA process, and the personal expert judgement of the team members. The review of the V&A was conducted by different members within the V&A team, other national experts outside of the team and also by the NCSP. Some sectors like

health and glacier/ice had very limited data to conduct full assessment and not much could be done.

Other parallel processes

By the time the preparation of the V&A chapter had started a separate process for addressing adaptation at a sub-regional level leading to the “Summit for a Living Himalayas” was already ongoing. This process was targeted towards addressing adaptation needs of the ‘south facing slopes of the Eastern Himalayan ecosystem’ consisting of the four countries of Bangladesh, Bhutan, India and Nepal with four focus areas of, food security, water resources, energy and biodiversity. With a limited number of experts in Bhutan and the need to ensure consistency in the assessments, the SNC project team took deliberate measures through ministerial executive orders to ensure adequate overlap of experts within the national team for the preparation of the national papers and also the SNC V&A task force. This was also aimed at ensuring that any adaptation priorities identified for Bhutan from the two processes would be aligned and that there was adequate sharing of data and information between the two processes, and minimal burden on the time for the sectoral experts.

Lessons from the V&A process in Bhutan

South-South Cooperation.

The experience of working with the South East Asia Regional START Regional Center (SEA START RC) was a very positive one. The regional center provided the technical expertise for the climate scenarios in a very relevant and cost effective manner and also fostered greater networking and cooperation within the region. The use of a regional center meant that experts were already familiar with the relevant scenarios and associated issues. Another benefit is that the cost related to collaborating with a regional center like SEA START RC is minimal to travel and incidentals and is much more affordable to hiring consultants.

Incidentally, the collaboration with SEA START RC was a result of another south-south cooperative program of the SNC with the link established during one of the capacity building and information exchange visits to Thailand by SNC task force members (mitigation group) to study mitigation projects and practices. Therefore the south-south cooperation increases greater use of existing resources and expertise in the region and increases networking and collaboration in a more relevant manner.

Motivation of national experts and stakeholders

Based on past experience with a multi-stakeholder consultative process in Bhutan and also the phase of the Greenhouse Gas Inventory under the SNC, the project team concluded that relying on local teams to complete vulnerability assessments would be difficult. This is mainly due to the nature of the national team which is assembled only for the duration of the project and do not provide adequate attention to the immediate objectives of the project which is seen more often seen as the objectives for the coordinating agency. The relatively small size of the SNC project, which is run by one coordinating agency, also leads to key stakeholder agencies not providing adequate attention or interest to the project. A related issue is that as a small country with a limited pool of experts, many individuals find themselves on several task forces and stakeholder groups, and there is some fatigue setting in with the multi-stakeholder process.

Some of the messages and lessons we learned are that with adequate resources and careful planning future assessments could dedicate certain components to be taken up by relevant agencies or stakeholders. This, however, runs the risk of coordination and the need for adequate financing which may not be possible while running a project funded by an “enabling activity” model.

One lesson in improving the motivations of a beleaguered set of limited sectoral representatives engaged in many task forces and consultations is that well planned and executed training programs, along with south-south cooperative visit programs to learn the best practices in the region increase interest and improve creativity in the formulation of replication and solutions at the national level. This however, needs to be planned and executed at the relevant point in time of the assessment process to

ensure best use of time and resources.

Incremental capacity building

It was clear from experience that a short training on climate modeling or vulnerability assessment tools would not be adequate to build strong capacity in Bhutan. Such short programs only provide a “taste” and are not enough to enable national experts to conduct the full climate modeling. The underlying problem is that the current level of capacity in Bhutan in terms of institutional setup and the level of technical expertise available are still quite low and it is clear that the challenges faced by the SNC process will remain for some time. To fully address these challenges will require dedicated capacity building programs at the institutional level with a longer term focus.

While such longer term capacity building needs and gaps cannot be achieved within the NatCom projects, the SNC and future NatCom projects can contribute to the process in an incremental manner. Each Natcom and subsequent exercise adds to the understanding and builds a base for further work. The INC had a very cursory summary vulnerability overview of Bhutan based on IPCC conclusions for similar ecosystems and regions. The SNC resulted in a more detailed and technically based assessment for climate scenarios and vulnerability in Bhutan and Adaptation Plan was prepared based on the findings of these assessments.

However, to address chronic capacity gaps in an incremental process which is likely to continue for a long time with reports every 4 years, it may be necessary to allow for long term training for national experts for various prioritised disciplines within the NatCom projects with the objective of addressing both the requirements of the Natcom process and climate change challenges in the country. It may also be necessary that for sectors to be able to fully conduct technical assessments there will be the need for separate projects outside of the SNC with comparable resources for both capacity building and the technical assessments.

Institutional setups and climate data

One of the challenges in the country has been the availability and quality of climate data. This is a result of competing interests and unclear mandates in the past. However with the increasing emphasis of climate change and through the repeated interactions initiated as a result of the various NatCom and NAPA processes in Bhutan there have been changes to improve the situation. Recently the hydro-meteorological service has been upgraded from a division within the Department of Energy to a separate Department by itself, but still under the Ministry of Economic Affairs. In the past, the meteorological services in Bhutan had at one time been under the Ministry of Agriculture as the competing interests were between the original purpose of collecting data for hydropower planning and emerging needs for farming which employs the majority of the population. With the new full Department of Hydro Meteorological Services and an expanded mandate to serve all users nationally, there is now high expectation that the met services will grow to be a more professional service that meets the needs of all stakeholders. This will also help future climate assessments but more support will be required to fill the spatial gaps in the data for a very mountainous country.

Cuba

La Experiencia Cubana en la Evaluación de la Vulnerabilidad, Impactos y Adaptación al Cambio Climático.

IN SPANISH

By: Guevara, A.V.; Planos, E.; Paz, L.R.; Valdés, A.; Llanes, J. **Technical Team - Second National Communication. Cuba**

Introducción

La República de Cuba ha desplegado una intensa actividad en relación con el cambio climático. Presentó su Primera Comunicación Nacional (PCN) a la Convención Marco de Naciones Unidas sobre Cambio Climático (CMNUCC) en 2001 y concluye ahora la Segunda Comunicación Nacional (SCN). El contenido de la PCN constituyó una verdadera línea base para el trabajo que se realizaría después. Sin embargo, ya en 1991 se había ejecutado un estudio preliminar sobre las posibles repercusiones del cambio climático en el territorio nacional, a solicitud del Estado cubano, con el Primer Informe de Evaluación del IPCC (1990) como punto de partida. Dicho estudio identificó algunos sectores que podrían resultar impactados, lo cual fue corroborado después por las evaluaciones nacionales que tributaron a las Comunicaciones Nacionales (CN).

Varios proyectos sobre impactos y adaptación, con financiamiento interno y externo, se desarrollaron desde finales de los años 90, con un saldo satisfactorio. Hoy se cuenta con un “Programa para el Enfrentamiento de la Sociedad Cubana al Cambio Climático”, concebido en varios niveles y que involucra a múltiples actores. Atención especial se presta a los eventos meteorológicos extremos, tanto por su impacto actual como por su incremento potencial con el cambio climático. Se dispone de estudios actualizados de peligro, vulnerabilidad y riesgo (PVR) para diferentes extremos climáticos, implementados hasta el nivel local. Gran repercusión ha tenido el Macro-proyecto “Escenarios de peligro y vulnerabilidad de la zona costera cubana asociados con el ascenso del nivel medio del mar para los años 2050 y 2100”, agrupación de proyectos individuales relacionados entre sí, destinado a evaluar los impactos de la sobreelevación del nivel medio del mar, incluyendo la influencia de la neotectónica y la dinámica costera. El Macro-proyecto ofrece salidas cartográficas de alta resolución espacial para todo el país, acompañado de ventanas en sitios de interés, y sus resultados están incorporados en los planes de ordenamiento del territorio a escala local. Para el sustento científico de todas las acciones que se desarrollan en el país, ha sido aprobado un Programa Científico-Técnico Nacional denominado “El Cambio Climático en Cuba: Impactos, Mitigación y Adaptación” que responde a las líneas prioritarias establecidas para el desarrollo del país en los próximos años.

Como estrategia de respuesta al cambio climático se ha trabajado además en la mitigación. Las opciones formuladas en la PCN sirvieron de base para la sustitución del equipamiento doméstico y empresarial con mayor gasto energético. Para la SCN se presentará un nuevo estudio que amplía significativamente el alcance de su precedente, con un resultado adicional relativo a escenarios de mitigación hasta 2050.

Hoy el país cuenta con Inventarios de Gases de Efecto de Invernadero (GEI) cada 2 años, desde 1990, así como con una valoración integral de su comportamiento durante el período 1990 – 2004, lo que permite conocer cuánto emite por las fuentes y cuánto absorbe por los sumideros. Como elemento interesante se destaca la obtención de factores de emisión nacionales, específicos para las condiciones tropicales insulares de Cuba, útiles para mejorar los parámetros de emisión, lo cual constituye una buena práctica para las Partes no incluidas en el Anexo I de la CMNUCC. Sus resultados podrán aplicarse en la Tercera Comunicación Nacional (TCN).

Se ha avanzado también en otras líneas con el objetivo de implementar la CMNUCC. Las acciones de educación ambiental, comunicación/divulgación y sensibilización en cambio climático se incrementaron notablemente en los últimos años, y ya se cuenta con estrategias específicas para su desarrollo en algunas de ellas. Recientemente se evaluó la factibilidad de recibir/transferir tecnología para mitigar o

adaptarse al cambio climático. Aún con estos avances, son disímiles los retos futuros (económicos, políticos, sociales, medioambientales, culturales).

Además de la voluntad política presente para enfrentar este reto global, junto a un adecuado marco legal e institucional, estos resultados son atribuibles a la visión continua, no a saltos, con que se conceptualiza el proceso de preparación de las CN en Cuba. O sea, no son elementos aislados, sino piezas clave de la respuesta cubana a la CMNUCC. En el presente trabajo se expone la experiencia cubana en vulnerabilidad y adaptación, con sus logros e insuficiencias, según la mirada del equipo multidisciplinario que conduce la elaboración de estos reportes.

Lecciones Aprendidas

Uno de los ejemplos más interesantes en cuanto a la continuidad del trabajo en las CN se constata en el componente de Vulnerabilidad y Adaptación (V&A). El Equipo Técnico asociado se creó en el INSMET, en 1996, a partir de la incorporación de Cuba en la Segunda Fase del Programa CC:TRAIN, patrocinado por el Programa de Naciones Unidas para el Desarrollo (PNUD) y el Fondo para el Medio Ambiente Mundial (GEF por sus siglas en inglés) e implementado por el Instituto de las Naciones Unidas para la Formación Profesional y la Investigación (UNITAR en inglés). Este colectivo se enriqueció y consolidó después, en 1999, al calor de un proyecto del Programa de Naciones Unidas para el Medio Ambiente (PNUMA), cuyo objetivo fue evaluar los impactos y la vulnerabilidad al cambio climático en Cuba, para 6 sectores socioeconómicos claves: agricultura y silvicultura, recursos hídricos, zona costera y recursos marinos, biodiversidad y vida silvestre, asentamientos humanos y salud; el que tributó a la PCN, junto con los resultados del primer informe sobre las variaciones y cambios ocurridos en el clima en Cuba durante la segunda mitad del siglo XX, concluido en 1996 por el Instituto de Meteorología.

Durante el período inter-reportes (2001 – 2008) el equipo se mantuvo trabajando bajo el principio de continuidad y sus integrantes participaron en diferentes proyectos de investigación financiados nacional e internacionalmente. Durante la SCN se reactivaron las coordinaciones y en el nuevo reporte de V&A fueron evaluados 7 sectores (se agregó Bosques), con lo cual se ampliaron de forma notable los conocimientos sobre la temática en el país. Se ratificó la alta vulnerabilidad de Cuba ante el cambio climático y se propusieron nuevas medidas para adaptarse a él, o fueron ratificadas otras formuladas en el informe anterior.

Entre los retos principales en este componente se ha identificado: el procesamiento y síntesis del gran volumen de información y resultados técnicos disponibles; la extensión de las evaluaciones a otros sectores muy sensibles, como el turismo; y la necesidad profundizar la cohesión de algunos sub-equipos dentro del producto, de la misma forma que se ha logrado en el sector agrícola, donde se dieron pasos importantes en su integración durante la SCN, incluyendo la asignación de la responsabilidad de su coordinación al ministerio correspondiente, y la creación en éste del Comité de Cambio Climático para la Agricultura Cubana.

Deben destacarse los esfuerzos sostenidos en la construcción de escenarios climáticos para diferentes horizontes temporales, línea donde se acumulan experiencias importantes, no solo en Cuba, sino también en el Caribe, vinculadas además con centros regionales y mundiales de excelencia. En este punto, el reto fundamental radica en la obtención de información de los cambios a escala local (“downscaling” de mayor resolución), con vistas a una incorporación más efectiva de los resultados a las políticas públicas locales.

Por último, como un desafío importante que no pudo ser cubierto completamente en la SCN, se señala la evaluación integrada de los impactos del cambio climático. En tal dirección se encuentra en marcha un estudio de caso en un área vulnerable ubicada en la costa meridional de la región occidental de Cuba. En ella se combinan la presencia de actividades económicas fundamentales, de importancia tanto para la localidad estudiada como para la capital de la República y el resto del país, una gran exposición a fenómenos hidrometeorológicos extremos y al ascenso del nivel del mar, junto a una explotación intensiva del territorio durante siglos. El componente metodológico de la evaluación integrada y la

evaluación económica de los impactos y los costos de la adaptación se identifican como dos de los retos principales en dicho estudio. Al finalizar la SCN se dispondrá de una línea base actualizada de la zona, de los escenarios climáticos e hidrológicos para los años 2050 y 2100; y una evaluación sectorial de los impactos del cambio climático y de las medidas de adaptación, sobre lo cual se efectuará la integración de impactos en una segunda fase. Como acciones que garantizan la continuidad en las investigaciones se encuentran la aprobación de un proyecto con financiamiento del Programa Nacional sobre Cambio Climático, con presupuesto nacional, y la elaboración de una propuesta de proyecto internacional para el área, a financiar por el Fondo de Adaptación del Protocolo de Kyoto.

Basado en el capital institucional y humano con que hoy cuenta el país, conformado fundamentalmente durante los últimos 50 años, el proceso de preparación de las CN ha constituido la principal fuente de oportunidades para la capacitación de los recursos humanos y el fomento de capacidades para asegurar la sostenibilidad de las actividades relacionadas con el cambio climático en Cuba. El desarrollo de proyectos con apoyo de países desarrollados y una activa cooperación Sur-Sur han constituido rasgos distintivos de la experiencia cubana. Como buena práctica puede señalarse la interacción permanente con las agencias del sistema de las Naciones Unidas relacionadas con el tema, en especial con PNUD.

Desde 1997 se dispone de una Estrategia Nacional de Educación Ambiental (ENEA), que incluye al cambio climático como tema priorizado y permite su tratamiento continuo por parte de los diferentes sectores de la sociedad. Así, se integra la educación y sensibilización pública sobre el cambio climático en el contexto de otros problemas ambientales y del desarrollo económico y social del país. La SCN sirvió como marco para la elaboración del Programa Cubano de Educación, Comunicación y Sensibilización Pública sobre Cambio Climático, acompañado de un amplio proceso de consultas, de alcance nacional pero con énfasis en lo local, donde el componente de V&A juega un papel fundamental. Ello crea las bases que aseguran la sostenibilidad de las acciones, así como su vinculación con el resto de las actividades que se desarrollan dentro de la ENEA.

Cuba no había realizado antes una evaluación de transferencia de tecnología (TT) para el cambio climático. Sobre la base de la optimización de los recursos disponibles para la elaboración de la SCN, se efectuó una evaluación preliminar del estado, contexto, capacidad, así como se analizaron diferentes escenarios para TT, tanto para la adaptación como para la mitigación. Como herramienta metodológica fundamental y de manera orientativa se tomó el “Manual para realizar una Evaluación de Necesidades en materia de Tecnología para el Cambio Climático” (PNUD, 2010). Dos de las principales lecciones aprendidas para cualquier proceso futuro de TT en Cuba fueron: evaluar primero el desarrollo tecnológico, la disponibilidad de tecnologías en el mercado, los principales suministradores y fuentes de financiamiento, incluyendo el Mecanismo de Desarrollo Limpio (MDL); y disponer de la capacidad para evaluar el recurso y los riesgos asociados a su explotación desde los puntos de vista tecnológico, económico, social y ambiental. Como reto queda dar continuidad en la TCN al camino iniciado ahora.

En la siguiente tabla se resumen algunas de las principales lecciones aprendidas en V&A en Cuba como proceso continuo.

Tópico	Lección Aprendida
Medidas de adaptación	Deben validarse cuidadosamente antes de aplicarse
Incertidumbres y reducción de vulnerabilidades	Deben formularse racionalmente y ser de utilidad, previa consulta con los actores de la sociedad.
Desarrollo de capacidades operacionales	Destinado a fortalecer los estudios de peligro, vulnerabilidad y riesgo (PVR) a los eventos extremos actuales. Orientado a mantener operativas y mejorar las redes meteorológicas, hidrológica, oceanográfica y otras especializadas (ej.: epidemiológica). Enfocado a la creación y desarrollo de sistemas de vigilancia y de alerta temprana.
Educación y creación de capacidades	Dirigidas a la sensibilización y al desarrollo de programas de instrucción para los diferentes actores de la sociedad, pero con objetivos diferenciados para cada segmento específico.
Colaboración	Desarrollo de acciones coordinadas a nivel regional y mundial, que permitan el incremento del conocimiento sobre los posibles impactos del cambio climático y favorezcan el desarrollo de las capacidades nacionales. Cooperación Sur – Sur y Norte – Sur.

En el futuro inmediato se vislumbran como próximos pasos:

- Integrar los resultados de la evaluación de la vulnerabilidad, impactos y medidas de adaptación en las acciones que la sociedad cubana adoptará para adaptarse al cambio climático.
- Incorporar y dar seguimiento a la adaptación dentro de los programas, planes sectoriales y proyectos relacionados con la producción de alimentos (animal y vegetal), la gestión integrada del agua, la construcción, el uso del suelo en la zona costera, la higiene y la epidemiología y en los planes estratégicos y de inversiones futuras, entre otros.
- Impulsar nuevos proyectos de evaluación de V&A, en el marco del Programa Científico Nacional de Cambio Climático en Cuba: Impactos, Mitigación y Adaptación.
- Dar los pasos iniciales para la preparación de la TCN.

La República de Cuba ha acogido la cooperación Sur-Sur como una práctica frecuente en sus relaciones con otros países en desarrollo, en particular en América Latina y el Caribe. Ésta ha abarcado tanto el proceso de preparación de las CN como la participación en proyectos, o la creación de capacidades generales en el tema del cambio climático. Durante la elaboración de las Comunicaciones Nacionales Iniciales, expertos cubanos brindaron su cooperación en varios países de la región, especialmente en temas de V&A y preparación de Inventarios de Gases de Efecto de Invernadero. Para la preparación de las SCN, la colaboración se extendió a nuevos países y a otras áreas geográficas.

Conclusión

- La preparación de las CN, asumida como un proceso continuo, puede constituir una oportunidad interesante para los países no pertenecientes al Anexo I de la CMNUCC. En Cuba, aunque todas sus componentes se han beneficiado con este enfoque, ha sido especialmente útil en V&A.
- Como principales fortalezas de este abordaje se identifican la posibilidad de contar con un equipo permanente dedicado al seguimiento de las CN; un mayor y mejor aprovechamiento de las capacidades creadas previamente con el financiamiento recibido; la utilización de opciones de colaboración Sur-Sur y Norte-Sur asociadas; y la factibilidad de dar continuidad a los aspectos nacionales reportados como críticos a la CMNUCC. Como co-beneficio, se señala la integración de los estudios tanto dentro como entre los componentes que conforman las CN.

- Para asegurar la sostenibilidad de esta vía se requiere garantizar la estabilidad del equipo de V&A dentro de las CN, con independencia de cambios sociopolíticos o institucionales, u otros. Ello implica situar la problemática del cambio climático en una alta prioridad nacional, donde la voluntad para enfrentarlo en todas sus aristas quede salvaguardada en cualquier circunstancia.

Recomendaciones

La estimación económica de los costos y beneficios de adoptar e introducir determinadas medidas de adaptación/mitigación constituye uno de los desafíos para la siguiente Comunicación Nacional. Puede convertirse en un incentivo adicional y resultaría un buen indicador para evaluar ventajas y desventajas, y bajo qué circunstancias podrían incorporarse (medidas “win-win”).

Eritrea

V&A Assessment, Methods and Tools for Cross sectoral Impact Assessment

By: Seid Abdu Salih National Climate Change Coordinator

Introduction

The Department of Environment (DoE), as the Executing Agency of the National Communications and Focal Point of the UNFCCC in Eritrea, called upon national technical experts, decision and policy makers from key institutions to institute a National Project Steering and Technical Committees for the preparation of National Communications (NCs) on a continuous basis. In this framework, the Eritrean Second National Communication (SNC), a follow-up to the Eritrean Initial National Communication (EINC), started in 2008 and was completed in 2011. The National Project Steering Committee provided continued policy oversight for the effective and efficient project preparation and implementation. The project management was responsible for effective coordination and efficient implementation of the project. A number of technical committees for thematic areas were entrusted and undertook separated technical studies on different aspects of the SNC while coordinating and synergizing their efforts on cross-cutting issues. Several capacity-building, education, public awareness and training activities on each component of SNC were organized and conducted. A central climate and climate change-related *quality-controlled data and information* center was established in the climate change unit under the auspices of the DoE. Various workshops, trainings, education and public awareness reports were produced, utilized and maintained. Several technical reports were produced as input to the final document of the SNC. The SNC was peer-reviewed for *quality assurance* by independent bodies at various levels including national, regional and international entities.

Frameworks, Approaches, Methods and Tools for V & A Assessments in Eritrea’s SNC

The *Adaptation Policy Framework* (APF) has been used as a Vulnerability and Adaptation Framework. The *Intergovernmental Panel on Climate Change (IPCC) seven steps*, the *UNEP Handbook* (Feenstra et al., 1998) and the *NAPA guidance* have also been used, as appropriate.

Within the APF, the following approaches have been used:

- i) the *vulnerability-based approach* for assessing current climate risks;
- ii) the *natural hazards-based approach* for assessing future climate risks;
- iii) the combination of both approaches was used;
- iv) whenever most appropriate, the *policy-based* and the *adaptive capacity approaches* was also used.

The policy-based approach has been used to investigate the efficacy of an existing and proposed policy in light of a changing climate exposure or sensitivity while the adaptive capacity approach has been applied to assess actions on increasing adaptive capacity and removing barriers to adaptation. Both natural hazard and vulnerability-based approaches call for the use of climate scenario methodology using climate models.

For the study of the Merb-Gash Basin, both qualitative and quantitative methods of cross-sectoral integration were applied. Qualitative methods involve identifying linkages and at least the direction of impacts. These rely on application of expert judgment, which requires understanding of sectors and linkages. Quantitative integration involves linking models between related sectors or applying models that integrate across sectors. It also requires that outputs of one model feed into another, so common variables expressed at common spatial and temporal units are used. Quantitative method was used for water resources, settlements (rural & urban), catchment, livestock, crop and ecosystems while qualitative method was used for human health sector.

Cross-sectoral Integration of Climate Change Impacts

In line with, decision 17/CP.8, paragraph 34, of the COP, the Eritrean SNC addressed cross-sectoral integration of Climate Change (CC) impacts. Cross-sectoral integration, involves examining sectors that are interrelated as climate change impacts do not happen in isolation. What happens in one sector affects other related sectors through direct and indirect impacts. Cross-sectoral Climate Change Impact Assessment addressed water resources, settlements, crop, livestock, catchments, land uses and other sectors such as industry and construction. In consultation with stakeholders, the Mereb-Gash Basin was selected for this purpose.

Integrator

Water resources / Mereb-Gash Catchment (the study boundary) were considered as an integrator (Figure 1). First, direct impacts of Climate Change (CC) on Water resources were simulated then the indirect impacts of these direct impacts on other sectors were evaluated.

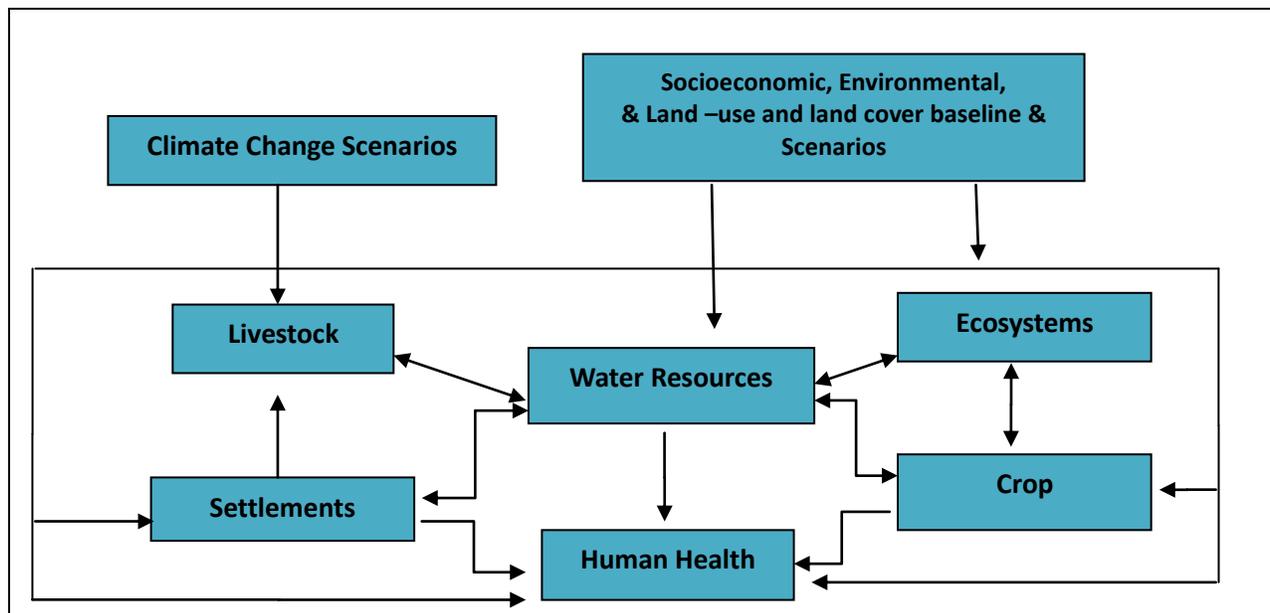


Figure 1: Relationship between CC, Water Resources & Related Sectors Used in Cross-sectoral Impact Assessment (Source: NVATWG, 2011)

Models

Cross-sectoral impact assessment involved tying together a number of models of related sectors (Figure 2). A number of criteria have been established and defined for the selection of the water resources impact model including integration, suitability, flexibility, practicability, and reliability. In this criteria framework, the modeling tool satisfying the criteria established has been the Water Evaluation and Planning (WEAP) Model. Besides, when the model was used, the statistics of modeled and observed streamflows at both phases of calibration and validation conducted at two streamflow gauge stations were in full agreement. The variability of observed annual streamflow has also been well preserved. Thus, the WEAP has amazingly reproduced the Mereb-Gash River. The model does perform very well

and is accepted for further future simulations and analyses in Mereb-Gash and other catchments in Eritrea.

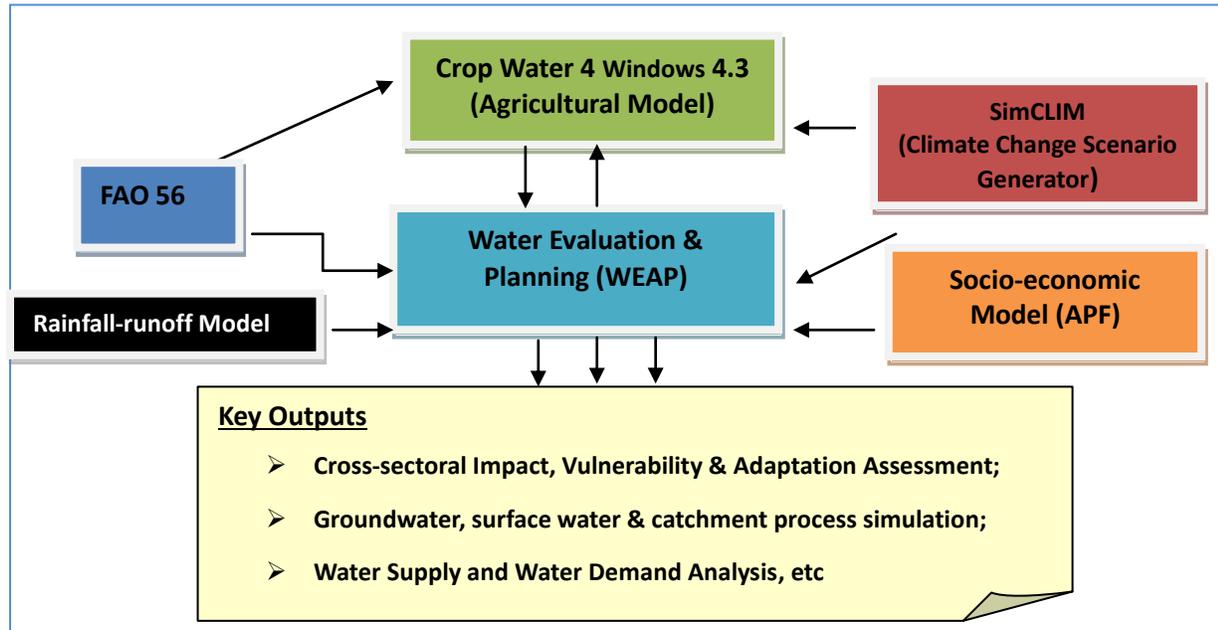


Figure 2: Quantitative Integration of Climate Change Impacts (Source: NVATWG, 2011)

Climatic and Non-climatic Baselines and Future Scenarios

Baseline and future scenario data occupied central roles for conducting cross-sectoral climate change impacts. Both climatic and non-climatic baseline and future alternative scenarios were established for each sector considered in the cross-sectoral impact assessment.

SimCLIM, a suite of 21 AOGCMs available at info@climsystems.com, was used to develop the baseline climate for 1961-1990 for basic climate impact variables of precipitation, maximum, minimum and mean temperature from Global Data Sets. The original baseline reanalysis climatology (1961-1990) for precipitation and temperature data came from WORLDCLIM, a global monthly climatology. The data sets include observations of surface variables at a monthly time step over land and ocean, surface and upper air observations at a daily time step from sites across regions and, for recent decades, satellite observations. The data sets are available as mean values, for various periods, interpolated to a regular grid. The following questions have been considered when accessing and applying this source of baseline climatological data for Eritrea:

- Are the original data sources, or the approach, well documented?
- Have the data been quality controlled and, if so, how?
- Have the original data been corrected, transformed, homogenized or modified in any way?
- Is there published information describing the dataset or approach and comparing it with others?

The result of the analysis conducted addressed these questions very well. Besides, the model (SimCLIM) baseline data surprisingly simulated well the Eritrean current climate both in pattern and magnitude. The alternative future model climate change scenarios for different time slices including 2030s, 2050s and 2080s were constructed using the SRES B2-medium and A2-high emission scenarios (in some cases for A1FI and B1 emission scenarios) for low, medium and high transient climate responses using 21 ensemble AOGCMs for 10 and 90 percentiles and median projections. Then, the required climate scenarios for impact assessment were obtained by combining the observed baseline climates with the model mean climate changes (either absolute or ratios). However, in preparation of future NCs three critical issues should be addressed in climate scenario construction for CC impact assessment. First,

there is incompatibility between the coarser resolutions of the AOGCMs and the fine detail resolutions of impact models. Therefore, the use of fine detail regional climate models and /or empirical downscaling models is critical. Second, lack of representation of climate variability and extreme changes scenarios with mean climate changes scenarios very likely create large uncertainties in the results of CC impact assessments. Hence, there is a need to construct such climate scenarios to improve the results of CC impact assessments. Third, there is a need to develop comprehensive scenarios for examining the consequences of stabilizing GHG concentrations at different concentrations, in line with Article 2 of the UNFCCC.

Moreover, vulnerability to climate change depends on the interaction between changing socio-economic conditions and climate hazards. In this context, the non-climatic baseline and alternative future scenarios used in the cross-sectoral impact assessments include socioeconomic and land use and land cover baselines and changes. In Eritrean SNC, baseline socioeconomic data was developed for the study area using four indicators including physical, demographic, economic, and governance with a number of sub-indicators within each indicator. Alternative future socioeconomic scenarios were selected or constructed for two purposes at two levels. At the global level it was used to characterize demographic, socioeconomic and technological driving forces underlying anthropogenic GHG emissions that cause climate change (B2 & A2 emission scenarios). At the local / regional levels it was used to characterize the sensitivity, adaptive capacity, and vulnerability of social and economic systems in relation to climate change. In the development of national socioeconomic scenario storylines, the A2 and B2, IPCC (SRES) emissions scenarios were adapted for reference use and to ensure consistency with other components of SNC (GHG Mitigation Chapter). Three scenario storylines were constructed for Eritrea. The Reference Scenario storylines does not consider climate change and was defined by the four indicators mentioned earlier. The second and third scenario storylines were two significantly different projections in which development will proceed, taking climate change into account through adaptation policies. One set of policies attempt to preserve current economic activities and socio-economic conditions using technologies; another set of policies alternatively emphasize manufacturing and service sectors attempting to reduce agricultural activity and supposing graduation of Eritrea from LDCs.

Land-use and Land-cover baseline data were defined for Browsing and Grazing, Rainfed, Irrigated, Woodland and Disturbed Forest Lands. Future scenarios for Land-use change and Land-cover change were adjusted and linked with the impact model (WEAP). Local technological baselines and changes were also inputted, adjusted for future changes and linked with the impact model. Environmental baselines such as water uses and recycling were also inputted.

Consistency and interaction between scenarios were considered critical in the cross-sectoral impact assessment. Consistency within and between various scenarios was maintained. For instance, temperature and precipitation changes constructed for 2030s were used to simulate the cross-sectoral impacts in 2030s while temperature and precipitation changes constructed for 2050s were used to simulate the cross-sectoral impacts in 2050s not in 2080s. Moreover, two or more scenarios were combined consistently in single model integration to simulate potential future range of impacts. Thus, interactions between scenarios were addressed during impact simulations. For instance, the impact of certain magnitude of change in temperature scenario combined with enhanced irrigation land use change scenario on water demand will have a paramount effect on irrigation water demand or groundwater resources than the impact of an equivalent temperature change scenario alone. Nonetheless, future socioeconomic, environmental, and land-use change scenarios have not been represented satisfactorily and needs to be integrated into the process of scenario development in future NCs.

Engaging Stakeholders

Stakeholders have determined the scope of the issues of interest and identified the links between climate and the sectors and regions under consideration. They have considered the future climate and socioeconomic scenarios and discussed the implication of these for the sectors and regions. In many climate change processes in Eritrea including Eritrean NAPA, stakeholders have undertaken a cost-

benefit analysis, multi-criteria analysis using NAPAssess model designed for Eritrea, and prioritization processes, for the adaptation measures suggested to assess the feasibility of implementing such measures. Stakeholders also have key roles in continuing the adaptation process.

Lessons Learned (LL)

A number of lessons were learned with respect to cross-sectoral impact assessments in Eritrea. These include, inter alia:

- It is essential to select methodological framework, approaches , methods and tools that best serve the purpose of the impact assessments and are the most appropriate for the technical capacity, data availability, and time and resource at disposal;
- Ownership of stakeholders over the process is crucial to ensuring and maximizing the policy relevancy of the impact assessments. Therefore, engaging stakeholders is a critical tool and accordingly it is crucial to ensure the active involvement of key stakeholders during the main stages of the assessments;
- Scenarios are one of the main tools for assessing future developments in complex systems that often are inherently unpredictable, are insufficiently understood, and have high scientific uncertainties;
- Consistency, interaction and feedbacks between various scenarios are critical for effective impact modeling;
- There is a need to deliver up-to-date scenarios for impact assessments- constructing regional climate scenarios by using outputs from AOGCM simulations that are based on SRES emission scenarios;
- The main limitations of the impact, (adaptation and vulnerability) assessment are, mainly, reflected in the uncertainties embedded in specifying alternative emissions futures (SRES), converting emissions to concentrations, converting concentrations to radiative forcing, modeling the climate response to a given forcing and converting model response into inputs for impact models. Thus, the level of scientific understanding (LOSU) is not adequate regarding the severity of climate change, and also how climate change could affect sustainable development (e.g., meeting MDG) and the endeavor of understanding climate change is a continuous process;
- Projections of climate for the next 100 years have a broad range due both to the differences of model responses and the range of emission scenarios. Choice of model makes a difference comparable to choice of scenario considered in Eritrean SNC;
- There is a need to develop comprehensive scenarios for examining the consequences of stabilizing GHG concentrations at different concentrations, in line with Article 2 of the UNFCCC;
- Integrated Assessment Models (IAMs) such as WEAP are valuable to conduct inclusive cross-sectoral impact assessment. In this backdrop, WEAP has many relevant features for Eritrea and will be adopted in subsequent National Communications. Besides, it is now available in new version with enhanced features such as the Water-Energy Nexus: Dynamic linkage to SEI's Long-range Energy Alternatives Planning (LEAP) system, wizard for modeling environmental flow requirements, wizard for exploring and importing time series data files (CSV), calculations are faster and more robust and numerous other improvements, optimizations and bug fixes;
- Cross-sectoral impact assessment in water resources and related sectors is part of mainstreaming climate change concerns in sectoral development plans and policies; and
- As a scaling-up of the LL, several NAPA follow-up projects have now adopted cross-sectoral impact assessments and designed adaptation activities based on the outcomes of direct and indirect impacts in related sectors in Eritrea. This approach has been found to be cost-effective in terms of money, time, labor, resource optimization and collaborations among applicable stakeholders

Major Challenges and Action Taken in Cross-sectoral Impact Assessment

Major Challenges

Major challenges faced during scenario construction and calibration and validation of the WEAP model include, inter alia:

- Availability of baseline time series streamflow, climate and other impact model calibrating data were limiting;
- Socioeconomic, environmental (especially water quality data), detailed land use and land cover data were limiting to establish baselines and to conduct an in-depth impact assessment;
- Incompatibility between the coarser resolutions of the AOGCMs and the fine detail resolutions of the WEAP model create mismatch between the time and the space scales at which scenario information commonly is provided and the resolution at which it is required for impact assessments;
- Lack of representation of daily to interannual climate variability and extreme change scenarios with mean climate change scenarios which would undermine the impacts of CC with only mean changes scenarios;
- As climate scenario construction methods combine model-based estimates of climate change with observed climate data, further uncertainties are therefore introduced into a climate scenario because observed data sets seldom capture the full range of natural decadal-scale climate variability because of potential errors in gridded global baseline climate data sets;
- Inadequate funds to carry out technical studies to address all priority socio-economic sectors;
- Inadequate analytical capacity to conduct CC related researches and to mainstream them into social, economic and natural systems; and
- Difficulty in coordinating large number of stakeholders with diverse interests and concerns in the process of SNC.

Action Taken or Planned to Mitigate Challenges

Broadly, the SNC has been used to overcome some of the challenges. The actions taken or planned to resolve these concerns include, inter alia:

- Baseline time series streamflow and rainfall data along with other essential statistics were modeled with a physically-based rainfall-runoff model designed for Eritrea to fill the data gaps observed in WEAP calibration and validation processes;
- Preparation of SNC has been used as an opportunity to build relevant capacity in national and sectoral policy and planning agencies;
- Opportunities presented during preparation of the SNC were used to improve the quality, availability, accessibility and utilization of climate and non-climatic baselines and other related information;
- SNC has been seen as an opportunity for the integration of Climate Change responses into water, energy, agriculture, health, education, social and environmental policies;
- Institutional arrangement for SNC in general and for V& A assessment in particular has been seen as an opportunity to enhance coordination and action;
- The use of fine detail regional climate models and /or empirical downscaling models is critical for scenario construction in future National Communications; and
- Improved guidance material and training is required in the construction of integrated global change scenarios especially concerning the development of non-climatic scenarios.

Conclusion

Information included in National Communications, as well as the capacity built during their preparation, can help increase the awareness on the issue of climate change and help introduce macro level policies that are more climate-friendly. However, Just introducing climate change in sector plans and policies does not result in implementation of concrete actions to address climate change. More work is needed to identify actual implementation options, best practices, costs and benefits analysis and access to different

technologies, and strategic assessments of policies and plans. It is also important that policies and plans be well integrated, because climate change impacts are not felt in only one sector in isolation.

Kyrgyzstan

Lessons Learned and Recommendations for V&A Assessment

By: Abaihanova Z.; Iliasov Sh., and Kuzmichenok V.

Introduction

Kyrgyzstan ratified the UN Framework Convention on Climate Change in 2000, the Kyoto Protocol in 2003, and submitted its first National Communication in 2003 and the Second National Communication in 2008 to the CoP.

According to the SNC assessments, the possible climate scenarios for 2100 show an average annual warming varying from 4 to 6°C, and annual precipitation either falling slightly (by 3%) or slightly increasing (by 2%). Such important changes in climate parameters will have an impact on natural systems through various activities and human health.

The national communication process provided a significant help in building institutional, legal and technical capacity in the country, and also in facilitating consultations and establishing relationships among key stakeholders, and in integrating NC recommendations into the main strategic development documents and national policies on the whole.

The acquired experiences and best practices at the technical level from conducting vulnerability and adaptation assessments, developing climate change scenarios and assessing present and future impacts were utilized in order to develop sound adaptation options and strategies and also for preparing: i) the sectorial Programme of Adaptation to Climate Change (executed by the Ministry of Human Health of Kyrgyzstan and supported by the WHO and UNDP), and ii) for producing a draft of the National Adaptation Strategy to Climate Change (being executed by the State Agency for Environment Protection and Forestry and supported by the UNDP). A broad range of relevant stakeholders were engaged in the preparation of these strategic documents.

The technical constraints encountered during the vulnerability and adaptation assessments under the NC process have been re-addressed.

The existing guidelines for the national communications preparation extend considerable preference for options' selection in almost all chapters, except the greenhouse gases inventory. On one hand, this stimulates elaboration of the users' own approaches and methods and enhances the national capacity, but on the other hand, the fact does not support comparability of the results.

Main Challenges

One of such a representatively inadequately formalized issue and a great challenge for V&A experts is a selection of the ***methodologies for the processing and presentation of the observed and expected climate change***. As a result, data in the national communications of the countries, even belonging to the same region, significantly differs, leading to certain problems in the implementation of actions on a regional level. For instance, while defining the joint adaptation actions for the sector of transboundary water resources.

Mainly, processing the observed climate change data is not problematic when a satisfactory national system of meteorological monitoring is put in place. However, quite the opposite situation is very often specific for the numerous developing countries, when quality of meteorological monitoring is far from perfect. The traditional approach suggests using only the long series of observations, discarding the short series and those with gaps in the observations. Generally, there is only a small number of long

series of observations available, thereto often having gaps. The situation appears even more complicated when trying to make assessments of the climate observations for the distinct selected areas.

The annual trend in the total number of meteorological observations in the Kyrgyz Republic is given in figure1. The represented quantity of observations demonstrates that relatively long series of observations start only since the 30-s of the 20th century. In addition, due to the economic challenges the scope of observation has been reduced for the last 20 years and is not sufficient for the required assessment of the definite selected areas.

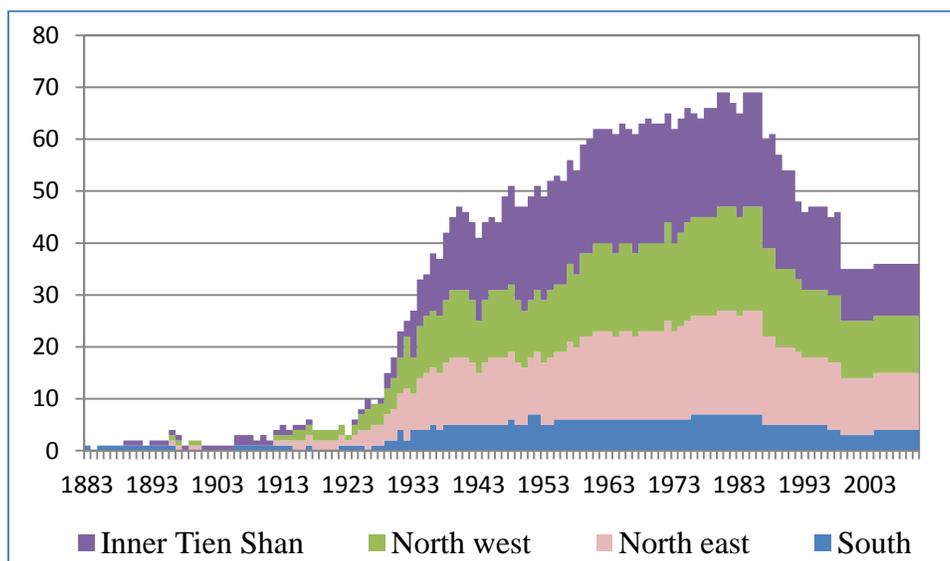


Fig. 1: Annual trend of meteorological observations for four determined climatic zones.

An example of available observations of surface air temperature for the selected area of Kyrgyzstan is shown at Fig. 2. Clearly, for the example shown it is practically almost impossible to do beneficial assessments of temperature trends based on the traditional approaches using the long series meteorological stations.

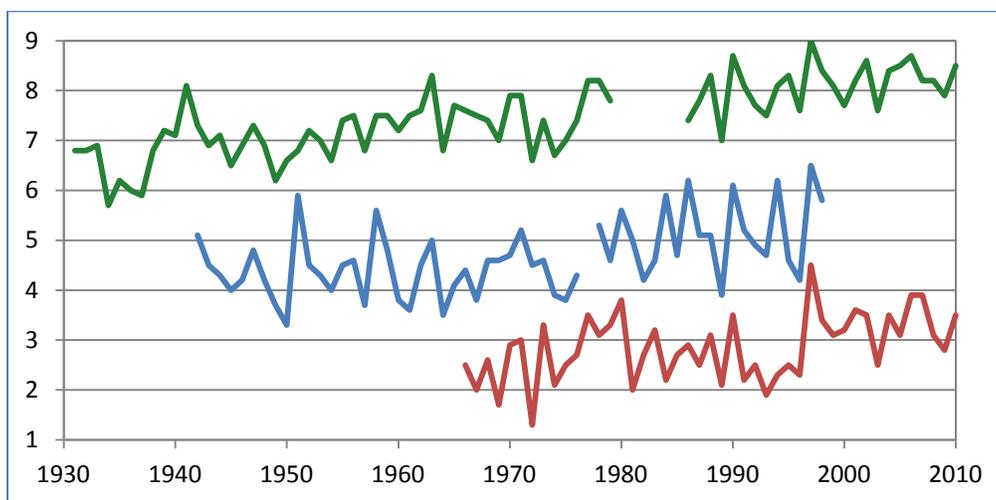


Figure 2: Trends in average annual temperature for the selected area, in °C

Methodological Approach

If we practice the traditional approach, it is conceivable to estimate a temperature trend only since 1966, although we have observation data (with gaps) since 1931.

To obtain the required assessment of climate change in such cases is possible by means of transformation of the initial series of observations. Under differentiating of the initial series a constant component is excluded from the observation data that allows getting the overall assessment of changes. For the example above, figure 3 demonstrates the results obtained after the consequent application to the initial data series of the differentiation operations to separate series, averaging of the differentiated series, and then the integration of the summed series. Obviously, the use of discrete data determines an application of the numerical differentiating and integrating operations.

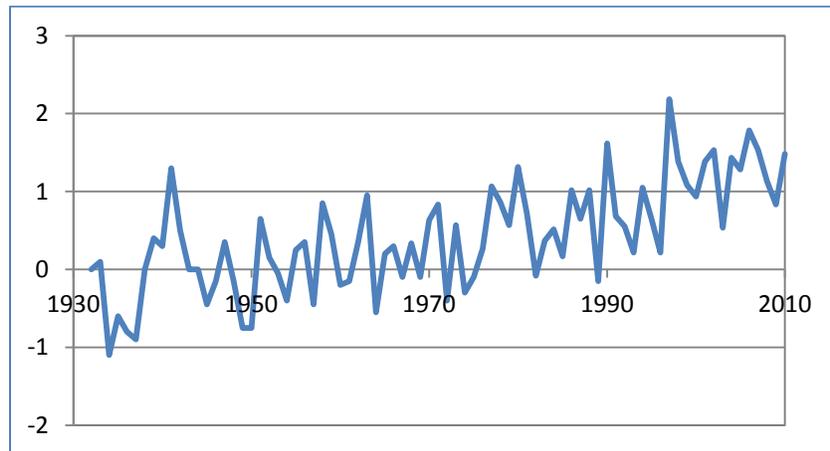


Figure 3: The resulting assessment of trends in average annual temperatures, ° C

The trends assessment given in Fig. 3 does not include a constant component, whose consideration is rather trivial and is determined by an attitude of the task set for the follow-up applications of the obtained trends.

This approach enabled Kyrgyzstan's team to achieve the assessments of the country's climate change trends since 1885, while the longest series of observations are less than 100 years. For some selected areas a situation on availability of meteorological observations data is obviously even more negative, and there is no possibility of getting the required climate change assessments. But even in these cases, the proposed approach can significantly extend in time and improve the assessments estimates of climate change trends.

Another challenge found by the SNC team was the need to **undertake better technical studies on biodiversity vulnerability** that will allow the identification of adaptation options that are more adequate and relevant to the national circumstances.

Biodiversity adaptation to climate change implies the need to determine the nature of climate change impacts and adaptation measures. There are different approaches known enough to assess the climate change impacts and offer measures for the biodiversity preservation.

A major barrier in assessing the vulnerability of the sector, faced by the team, was the inefficient monitoring, incapable of providing the necessary data on the selected indicators. Moreover, the fairness of the selected indicators was also a matter of controversy.

National Approach

Kyrgyzstan's experience in solving these problems might be useful. The team decided not to rely on data on the changes in number or ranges of individual species, and to do a vulnerability assessment as a whole, taking for the base the favorable conditions for vegetation and habitation of flora and fauna species, i.e. for the whole ecosystem. The advantage of this approach is that it does not require the detailed monitoring of the indicative species. Availability of the more broad-spectrum indicators, which are easier to obtain, is sufficient for it. By assessing changes in the climate niches we can assess favor for the ecosystems' vegetation and habitation conditions in the future.

The studies were continued after the SNC preparation, and here we will present an assessment of the spatial shifts of optimal habitat. Apparently, the different ecosystems have their own optimal area, which among other factors, is determined by the climatic factors. Change of the climatic conditions inevitably leads to a shift in boundaries of the optimal habitat. Information on the expected shifts of the boundaries enables, first an assessment of the impact level of the climatic factors and, second the ability to undertake preventative measures towards biodiversity conservation.

An approach to modeling the potential changes in the areas of climatic optima was examined in the principal forest tree species in Kyrgyzstan, which, in turn, are the habitat for wildlife species.

The method is based on applying the digital models of humidification parameters of Kyrgyzstan (average annual air temperature, annual sum of precipitation, evaporability, evaporation, runoff model and moistening)¹ and the topography (altitude, slope, exposure, mean curvature and orientation factor) with a spacing of 500*500 m.

To evaluate the optimal climatic areas a digital model of Kyrgyzstan's forests and bushes has been used, as referred to in the map "Forests"². In the model the forests' and shrubs' main breed, as well as the admixture of other species, was fixed to each of the nodes of a regular grid corresponding to digital relief models and characteristics of moistening parameters.

The disposition areas were developed for the specified major tree species in Kyrgyzstan by an average annual air temperature and annual precipitation. Only those forests areas were considered where a given species is the principal.

Further analysis proved a necessity to account for the ground angle for walnut, and locality exposure - for spruce and fir (Fig. 1). Subsequently, for modeling of walnut potential areas the maximum angle was set at 21,6° (96% at disposition), and for spruce and fir the feasibility intervals were additionally calculated by the ground exposure. Interval of 25-75% corresponds to a high feasibility of growth for the specified forest breed, intervals of 9-25% and 75-91% - mean potential level, and the intervals 2-9% and 91-98% - a low level (hereafter they are labeled as 1, 2, 3).

At the initial stage the soil characteristics in the new habitats were not considered, which can be counted further while making decisions on new forest planting.

The calculation on the intervals' borders by the climatic factors of varied likeliness is presented in Table 1 showing that the intervals, both by temperature and precipitation, overlap to a large extent for a variety of tree species ranges. Thereby, the climatic optima for some tree species are very compatible. This overlapping of the modeled climatic optima is particularly observable for couples of tree breeds, such as "juniper Zeravshan - juniper hemispherical" and " juniper turkestan - spruce and fir."

Due to a considerable uncertainty in the expected climate change assessment, three options for temperature increase by 1.5, 4.0, and 6.4 °C were considered, at additional variations of precipitation changes in the range of increase and decrease by 10%. Basic modeling was done for each of the 9 preset options for the projected climate change. In its course, by digital modeling, the feasibility interval for tree species vegetation under a given change of climatic parameters (the new average annual air temperature and the new sum of rainfall) was defined for each node of a regular grid. The results were filed by a computer program. Herewith, one node of a regular grid has a "service area" of 0.25 km².

It is interesting to note that under temperature increase a multidirectional dependence of the areas' shift for different species is observed – increased for juniper Zeravshan, slight variation for juniper hemispherical, reduced for Turkestan juniper, reduced for spruce and fir, and growing for walnut.

¹ Kuzmichenok V.A. Digital models of humidification characteristics of Kyrgyzstan. Mathematical and cartographic modeling. Bishkek, ed. Kyrgyz-Russian Slavic University, 2008, p.228

² Map "Forests", scale 1:500.000 of "Natural Resources of the Kyrgyz SSR" series.

Fig. 4 - 6 demonstrates the results of shift modeling for the walnut optimal vegetation areas under different climate change options. Analogous outcomes were obtained for other major tree species in Kyrgyzstan.

Species	Lower boundaries			Upper boundaries		
	N3	N2	N1	V1	V2	V3
	Average annual air temperature (°C)					
Juniper Zeravshan	-2,89	-0,53	1,58	5,66	8,06	10,14
Juniper hemispherical	-3,54	-0,63	1,19	4,21	5,60	6,79
Juniper turkestan	-4,88	-2,94	-1,28	2,19	3,91	6,20
Spruce and fir	-5,40	-3,80	-2,19	1,67	3,43	5,20
Walnut	1,42	3,38	5,51	8,45	9,6660	10,67
	Annual sum of precipitation (mm)					
Juniper Zeravshan	392,1	488,2	635,3	956,4	1046,2	1119,0
Juniper hemispherical	437,4	507,3	594,1	752,5	901,7	1019,0
Juniper turkestan	301,6	407,7	567,7	806,4	908,1	975,9
Spruce and fir	320,7	395,1	505,0	728,8	844,3	1002,3
Walnut	674,7	766,0	858,5	983,8	1057,1	1153,0
	Slope exposure (°)					
Spruce and fir	131,2	183,9	254,5	11,9	59,2	96,9

Table 1: The boundaries of the probabilistic intervals for the specified main tree species of Kyrgyzstan

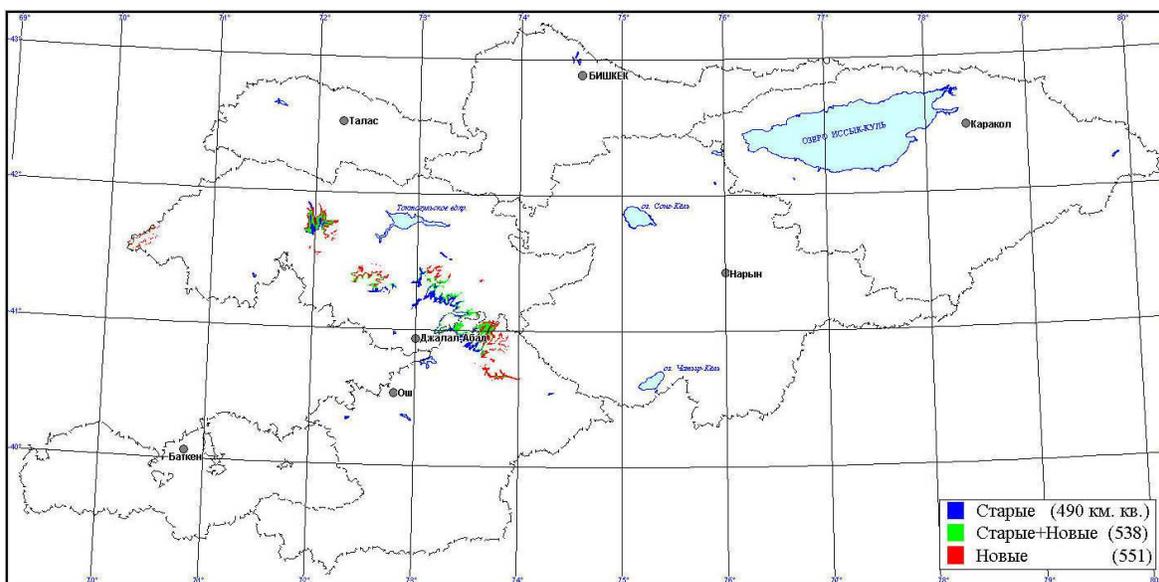


Fig. 4: Modeling of climate zones with a high potential of walnut vegetation (aged - in the 70's XX century, young/recent - for $\Delta=1,5^{\circ}\text{C}$ and $m = 1,0$) (blue – aged, red – recent, green –aged+recent)

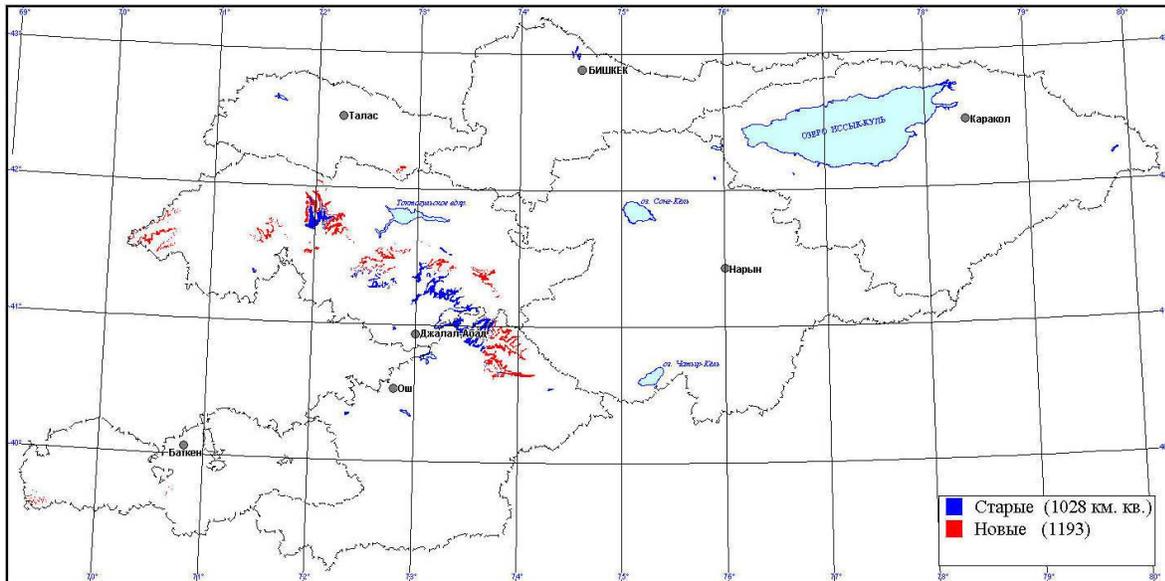


Fig. 5: Modeling of climate zones with a high potential of walnut vegetation (aged - in the 70's XX century, young/recent - for $\Delta=4.0^{\circ}\text{C}$ and $m = 1,0$) (blue – aged, red – recent)

The approach can be used in designing of both the economic and nature conservation actions. Actually the outcomes are a practical guide to mainstream the adaptation scope into the forest management and further afforestation in the country accounting for the expected climate change.

It also can be applied to a vulnerability assessment of other types of diversity, including the Red Book species, and used in designing the adaptation options to adjust the protected areas' boundaries in view of the expected climate change.

Conclusions and Recommendations

The experience of Kyrgyzstan's team under the SNC preparation regarding the meteorological observations' data processing could be helpful in developing common approaches by the country, ensuring a better level of data consideration, comparability and prioritization of the adaptation options. The biodiversity sector proves to be one of the most complicated cases in terms of V&A assessments. The two approaches help to develop the sound vulnerability assessments in terms of lack of a right monitoring system and of data incompleteness

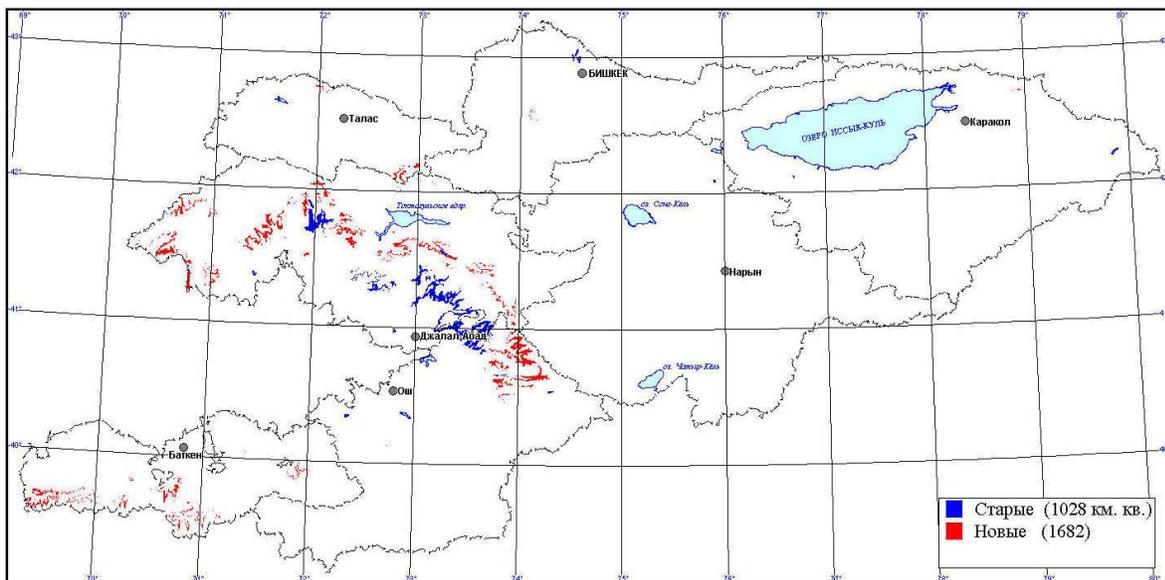


Fig. 6: Modeling of climate zones with a high potential of walnut vegetation (aged - in the 70's XX century, young/recent - for $\Delta=6.4^{\circ}\text{C}$ and $m = 1,0$) (blue – aged, red – recent)

National experiences and best practices often remain unknown, not generalized and propagated. This sometimes happens due to the language barriers, sometimes due to lack of communication skills.

To improve the situation and enrich the national capacities, a broader operational support is needed in arrangement of the global and regional in-job trainings of experts, facilitation of knowledge exchange between the experts by all available communication means. Language barriers should be minimized in access to technical expertise and guidance on particular topics, as well as to the cases representing best practices, in feasibility of participation in discussions, analytical reviews, etc.

Nepal

Climate Risk, Vulnerability and Adaptation

By: Mr. Lava Bahadur K.C., Under-Secretary and Head, Climate Change Council Secretariat Section, Ministry of Environment, Science and Technology

Introduction

During the Earth Summit in Rio de Janeiro in June 1992, Nepal signed the United Nations Framework Convention on Climate Change (UNFCCC) along with other over 150 nations. Nepal ratified the Convention in 1994. As a Non-Annex I Party to the Convention, Nepal has to prepare and share the national communication report including data and information on climate change and implementation of the Convention in accordance with the Article 12 of the Convention. Following the process, Nepal prepared and shared with the Parties the Initial National Communication (INC) Report in July 2004. The INC Report included data and information on national GHG inventory, climate change vulnerability and adaptation and impact of climate change and mitigation measures adopted to reduce GHG emissions of Nepal. In process of National Capacity Needs Self-Assessment (NCSA) Report preparation, Nepal prepared three reports: stocktaking, thematic assessment and cross cutting issues in connection to assess national needs and determine priorities for capacity development for the implementation of UNFCCC including two other Rio Conventions – UN Convention to Combat Desertification and Convention on Biological Diversity.

INC and NCSA pointed out issues in relation to adaptation activities including inadequate financial, technological and human resources. Barriers were also identified in different sectors where incomplete implementation of existing plans and policies pertaining to mandates and roles of devolved structures are lacking or inadequate. Public awareness in relation to climate change with disasters is low; there is only limited reach of early warning systems; and lack of land use planning and limited implementation of building codes are prevalent.

To address those issues, Nepal also prepared Nepal Adaptation Program of Action (NAPA) in September 2010 by following the guidelines adopted by COP7, and annotated guidance provided by the Least Developed Countries (LDC) Expert Group (LEG). Nepal prepared her NAPA of programmatic level with country-driven extensive consultative processes and by mobilising the Thematic Working Groups (TWGs) on: (i) Agriculture and food security; (ii) Water resources and energy; (iii) Forests and bio-diversity; (iv) Public health, (v) Urban settlements and infrastructure and (vi) Climate induced disaster. NAPA has prioritized nine programmes as urgent and immediate adaptation needs based on the climate vulnerability assessed. Nepal's NAPA also commits to channel more than 80 percent of the total funds for field level activities. In order to operationalize climate adaptation, the Government of Nepal has also approved National Framework on Local Adaptation Plan for Action (LAPA) in November 2011. The LAPA provides opportunities to implement stand-alone adaptation plan and integrate adaptation actions into planning process at different levels. The periodical plans developed after 2007 also made particular

emphasis on climate adaptation, and climate change in general. In a nutshell, NAPA was instrumental to initiate and/or expand climate change activities in Nepal.

In order to expand climate change activities, the Government of Nepal approved the Climate Change Policy in January 2011 and started its implementation. The policy focuses on climate adaptation and disaster risk reduction, low carbon development path and climate resilience, accessing climate finance, research and development, peoples' empowerment and making the natural resource management climate-friendly.

Nepal started preliminary work in 2008 related to preparation of the Second National Communication (SNC) report. Although, NAPA and NC have been prepared using guidelines, there are some repetitions in climate change vulnerability activities. The level of detail is also guided by the guidelines. SNC could not fulfil the gaps of NAPA but enhance the need of immediate implementation of the climate change adaptation activities through its updated information.

Experiences and challenges

Responding to the need to address the impacts of climate change, the Government of Nepal (GoN) has initiated the process of adaptation planning. This includes a number of policy and institutional processes including coordination mechanisms. For instance, in terms of policy planning initiatives, the GoN has completed the preparation of the NAPA document and has in place a donor compact on climate change, which provides the basis for alignment and coordination amongst development partners behind a nationally led adaptation planning process. In terms of institutional processes, the GoN promoted mobilisation of Climate Change and Knowledge Management Centre and a Multi-stakeholder Climate Change Initiatives Coordination Committee to ensure functional level coordination and ensure timely information flow with and between partners and stakeholders also to promote robust and iterative adaptation planning. The Government has established a Climate Change Management Division within the Ministry of Environment, Science and Technology which has a mandate to coordinate the climate agenda in Nepal.

Following the Climate Change Policy and the NAPA, the Government recognizes the need to mainstream adaptation into national planning processes. It is also keen to support local planning processes and capacities, and acknowledges that effective adaptation support will need to be mainstreamed into development planning at all levels - local, sector and national levels.

While implementing NAPA and NCs Nepal has experienced several issues that need to be addressed, e.g; condition of co-financing for adaptation actions from LDC Fund, the complex process of accessing the fund, and the lengthy communication process required for achieving the collaboration among Parties, GEF and GEF implementing agency.

In the process for implementing NAPA the country has prioritised most urgent and immediate adaptation actions, and has come up with an innovative local planning process called Local Adaptation Plan of Action (LAPA). For this purpose, 70 Village Development Committee (VDCs) have been identified in 14 districts of Mid-western and far-western development region of Nepal. 70 Local Adaptation Plan of Action (LAPA) have been formulated and identified the local adaptation actions to be carried out in the project area. District Development Committee (DDC) coordinates the entire project activities in the designated VDCs.

The LAPA process provides opportunities to assess site-specific climate vulnerabilities, identify adaptation options, and implement the urgent and immediate adaptation actions with the participation of local communities and households. Nepal will shortly start implementation of these local adaptation plans, and we would be happy to share our experiences as we make progress with the implementation of LAPAs. Nepal would like to take this opportunity to explore additional funding for such innovative and country-driven activities so as to enable the vulnerable communities and households to adapt to the adverse impacts of climate change. Likewise, after the completion of INC GoN felt need of updating information for addressing climate risk and vulnerability and adaptation and moved ahead for the

preparation of SNC.

Although policy and other instruments are in place, there are hidden challenges that have to be faced while preparing NCs viz lack of technical manpower who can develop and run different models within limited financial resources to develop national database.

Climate risk and Vulnerability and adaptation for climate change integration

NAPA assessed climate risk and vulnerability and adaptation for climate change on six thematic areas and recommended the major adaptation activities for further implementation with indicative budget of about USD 350m. The GoN with its partners have started implementation based on technical and financial assistance received. The NC process in context of Nepal has vital role in recommending new areas to integrate in climate change. As mentioned above, SNC might flag additional areas to explore and integrate into climate change. For example, current situation of Nepal indicate agriculture sector as the most vulnerable to climate change. Specifically, decreasing productivity of livestock due to climate change threatens the farmers of Nepal. Farmers have not access to new technologies to prevent the decrease of productivity. NC may provide some adaptation strategies for the specific problem indicated above.

Government of Nepal has made its attempt to assess the impacts on different sectors such as agriculture, water resources, forest and biodiversity, human health and disasters. Agriculture is the most important sector in Nepalese economy. It contributes about 35 percent to the Gross Domestic Product (GDP) and employs about two-thirds of the economically active population. The climate change has potential impacts on costs of production, farm revenues, farm value, employment, income, consumption, and GDP. Livestock production is highly sensitive to climate change. Increased temperature increases lignifications of plant tissues and reduce the digestibility reducing meat and milk production in range-based livestock production system.

Climate change could have a negative impact on major cereal production such as rice and wheat production. A rise in maximum temperature during the crop season increases wheat yield. Rise in minimum temperature has no effect on wheat yield. Decrease in precipitation during the crop season constitutes the main problem in wheat production.

Time series studies on glacier and snow shows that majority of glaciers in Nepal Himalayas have retreated in the range of 30 to 60 m in the past and some smaller glaciers have begun to disappear. Therefore, climate induced disasters are increasing in number at present and will increase in the future as well. Increasing temperature would increase the water requirement on one hand and decrease the water availability during dry season on the other. This would result in a growing gap between demand and supply of water for irrigation.

Climate change has increased vulnerability on forests and biodiversity of Nepal. Rise in temperature, decrease in snowfall, increased variability and timing of precipitation, these all are impacting flowering and fruiting season and also ultimately resulting in difficult situation for survival of plant species in forests and change in wildlife habitat also. The climate change has differential risk on human health due to different levels of vulnerability of the people. There are huge spatial and temporal variations of climatic elements in Nepal. Vulnerable population in terms of climate change is found to be varied with population characteristics, geographical location, settlement types, and occupational groups, social, political and cultural situations.

Nepal is prone to a multitude of climate-induced hazards such as floods, flash-floods, glacial lake outburst floods, landslides, windstorms, hailstorms, heat and cold-waves, cloudbursts, forest fire, drought, famine and epidemics. Among the major hazards, floods and landslides are the most recurrent climate related hazards in Nepal. The risk of potential glacial lake outburst flood damaging far downstream areas is increasing. Similarly, the incidence of flash floods, landslides and debris flow is likely to increase in the context of increasing frequency of heavy precipitation due to climate change. Women generally grow vegetables, process, manage and market them. They are also responsible for

raising small livestock. Crop failures and livestock death due to extreme climatic events cause women to sacrifice for her family by eating less, resulting in under-nourishment and putting the family at a greater risk of unmanaged resources. A socio-economic vulnerability assessment showed that nine districts of Nepal are highly vulnerable, 27 districts are in medium level of vulnerability and 39 districts are in low level of vulnerability.

NC process in general is designed in such a way that it can integrate more thematic areas into the climate change assessment. The project aims to demonstrate how policy for adaptation can be integrated into national sustainable development for four sectors viz; water resources, agriculture, forestry and human health. It has also tried to integrate current research, education pattern, education strategies, and socio-economic policies into the climate change study. For example, NC recommends how climate change can be mainstreamed in school curricula and aware the students from their primary education. They can understand their present and future vulnerability to climate change and how to cope with the changing climate issues.

Conclusions

Nepal has already finalized INC (2004), NCSA (2008) and NAPA (2010), which focused on the issue related to climate risk, vulnerability and adaptation strategies.

Further, SNC, Pilot Program for Climate Resilience (PPCR) and Nepal climate Change Support Program (NCCSP) will address and give more updated strategies on the climate risk, vulnerability and adaptation. The NC process exists in between those climate change initiatives. Issue related to the specific activity of NC process to make NC process regular is challenging in countries like Nepal, a mountainous, land-locked, climate vulnerable, and LDC. As guided by the National Climate Change Policy of Nepal (2011), adaptation is the major area for immediate intervention, also in view of negligible emissions of GHGs gases, meaning that Nepal has no potential to benefit much from forest resources. So, NC also guides for the assessment of vulnerability and suggests the adaptation measures that best fits for the nation circumstances.

CHAPTER IV USING NATIONAL COMMUNICATIONS AS A TOOL TO INTEGRATE CLIMATE CHANGE INTO NATIONAL PLANNING

As countries continue to struggle to use the outputs of the NC process such as the GHG Inventory into the national development agendas, the papers presented in this section show how countries have used different strategies to mainstream the issue of climate change into their development agenda. For example The Gambia has used the data and information generated from the Initial and Second National Communication as inputs into the process of mainstreaming climate.

On the other hand, for countries such as Bosnia & Herzegovina, the NC (INC and SNC) process has contributed significantly to the achievement of national environmental objectives through an improved water resources, agriculture, and human systems.

Other countries such as Uruguay describe how the NC process has facilitated the access to financial support for other projects identified by the NC process and linked with sustainable green development.

The following countries are depicted in this chapter:

1. **Afghanistan:** National Communication Process as a Tool to Integrate Climate Change into National Planning
2. The role of National Communications in integrating climate change into national planning. Experiences from **Bosnia& Herzegovina.**
3. Mainstreaming Climate Change in **The Gambia's** Programme for Accelerated Growth and Employment (PAGE) Document, the role of SNC.
4. **Montenegro** National Communication, a step towards a low emission resource efficient economy.
5. The National Communication Process in **Uruguay** and its contribution to the integration of climate change into the national development agenda

By: Hamidullah Akbary National Coordinator, INC Project/Afghanistan

Introduction

The Islamic Republic of Afghanistan is amongst few countries who are still implementing the INC to the United Nations Framework Convention on Climate Change. Afghanistan has yet to ratify the Kyoto Protocol; this clearly indicates that despite being a highly vulnerable country to the impacts of climate change, the issue of mainstreaming climate change into development planning is relatively new.

Compared to many developing countries, Afghanistan has only initiated the process of mainstreaming environment into development planning in 2000. In recent years this process has gained some momentum. There has been significant rise amongst the policy makers in the understanding that economic and social development and the environment are fundamentally interdependent. One of the key tasks performed during the INC preparation process was to review our national development plans, sectoral development plans and legal system to prepare the status on how the issue of climate change and their likely impact could be integrated in our development plans.

The Afghanistan National Development Strategy, (ANDS) (2008-2012) a strategy for security, governance, economic growth and poverty reduction is the national vision for 2020 and has included environmental sustainability as a key component in achieving a society of hope and prosperity. Despite being introduced in 2008, climate change is not considered in the national or sectoral plans of the Government of Afghanistan in ANDS. The phrase 'climate change' is not mentioned either in the ANDS or any sectoral development strategies that are part of the ANDS. However, they contain a number of programmatic elements that respond to existing stresses and support adaptive capacity.

During the INC project implementation, National Environmental Protection Agency (NEPA) established the National Climate Change Committee which was then divided into two sectors- Division of Climate Change and Division of GEF Coordination. Six different National Study Teams involving national experts from key sectoral ministries and universities were formed and trained to prepare the thematic reports of INC as well as the final report. These institutional arrangements have somehow helped to remove some barriers on the poor coordination amongst different stakeholders and helped to bring together different government partners, academia, media, provincial governments, and donor communities to address the issue of climate change, a good example of stakeholder's participation and national capacity building.

Main Lessons of INC Process and Challenges

The INC preparation process in Afghanistan took four years, and experienced many difficulties in initiating the process. The following are the main lessons learned from the INC preparation process in Afghanistan.

- In a post conflict or country still in conflict like Afghanistan, during the initial stage of the project more focus is needed on training the involved officials and staff of the implementing agency and to involve them in project management. In order to undertake basic assessments more provisions of training at national and regional level is vital and should be prioritized in future projects to increase the technical national capacities.
- In a project that aims to produce a national report with maximum focus on stakeholders' participation, involvement of key institutions in the project management is very vital for long-term sustainability and knowledge transfer.
- Accurate national data and statistics are central to the preparation of the national report. In Afghanistan, the non-availability of such data or variance in figures even in government published reports, demands greater effort in obtaining a uniform format for data storage from all key stakeholders and also requires a better networking process between implementing agency and key stakeholders.

- Given that the country is still in conflict, organization of consultation at provincial and regional level is very difficult through international agencies and therefore the involvement of provincial offices of the implementing agency from the beginning of the project, with specific roles and responsibilities, can be instrumental for generating inputs from provinces.

Challenges

In the process of developing its INC Afghanistan has faced many challenges, and amongst them the most significant challenges were the shortages of qualified human resources and the availability of reliable data.

Universities in Afghanistan are yet to prioritize the environmental and climate change subjects in curricula and conduct research. This is one of the main reasons for the lack of qualified human resources in the country and the high dependence on international experts. Despite many coordinating mechanism established as per the Environment Law, poor coordination amongst the stakeholders is highly felt. The INC process was highly focused on stakeholder's participation and has shown the essential need to work with a great range of stake holders, in order to best address the challenges of climate change in Afghanistan.

During the NC process, Afghanistan identified many constraints and gaps associated with the preparation of the initial national communication as well as the needs to develop national capacity for the improvement of national communications on a continuous basis. As such a list of projects was identified for improving the future communication system in Afghanistan.

Good Practices: INC Process and Integration of Climate Change in National Planning

One of the key achievements of the INC process of Afghanistan has been to create awareness regarding climate change issues at policy making level. We have advocated that current national development and sectoral plans do not properly integrate issues such as adaptation and mitigation. We also advocate that it is fundamental to include specific outputs for "integration of climate change issues in the forth coming ANDS and other sectoral plans" in the climate change adaption project under the LDCF to be implemented in Afghanistan beginning in 2012.

The INC process helped to initiate the process to become party to Kyoto Protocol and three pollution related conventions which are more linked with climate change. NEPA invited stakeholders' members from NCCC and Committee for Environmental Coordination and media people to discuss the national position on regional and global climate related meetings and conventions and to brief them on the outcomes of such meetings.

INC process has indirectly helped Afghanistan to contribute in the preparation of two regional action plan on environment and climate change, namely *Framework Plan of Action on Environmental Cooperation and Global Warming for Eco-Member States, 2011-2015*; and *SAARC Action Plan on Climate Change*.

The INC process has enhanced the capabilities of the members of various coordinating mechanisms who participated as members of the National Study Teams during the INC process to link climate change related issues into sectoral plans which required addressing the likely impacts of climate change to achieve the objectives of sectoral plans. Besides National Climate Change Committee, other coordinating bodies will help to integrate climate change issues in national planning. The other coordinating bodies include: National Environmental Advisory Council, High level commission on Air Pollution Control, Committee for environmental Coordination; Supreme Committee for Environment, National Disaster Management Commission, Provincial Disaster Management Committee, Supreme Council for Water Resources Management, River Basin Councils, Inter-ministerial Committee on Food Security, and Inter-ministerial Committee on Energy.

The National Environmental Protection Agency of Afghanistan (NEPA), the focal point of UNFCCC and many other Multilateral Environmental Agreements (MEAs) has encouraged Kabul University to establish

a separate Department of Environmental Protection and Disaster Management and have signed a Memorandum of Cooperation with the university to develop national human resources capable of dealing with challenges of environmental degradation and climate change. In addition to this NEPA and other government institutions have signed memorandum of cooperation including the Disaster Management Authority that will enhance the integration of environmental, climate change and disaster management issues.

The NC project could help to integrate climate change issues in the forthcoming national plans and programs. One of the main achievements of the project was the institutional arrangements made in the form of coordinating bodies and also the recently two divisions added at NEPA: Division of Climate Change, and Division of GEF Coordination. The INC process has also contributed significantly to increase the awareness of the stakeholders regarding the various opportunities that the country is given as a Least Developed Country from the various financial mechanisms of the UNFCCC and other MEAs including the CDM and REDD+.

Conclusions

Afghanistan has faced many constraints and gaps during the preparation of the INC, these constraints need to be addressed in order to improve the objectives and outcomes of the process. After evaluating the constraints and gaps found during the INC preparation process, Afghanistan has identified a number of projects that could help Afghanistan in improving national capacities as per the provisions of UNFCCC, along with recommendation on how to obtain financial and technical support during the implementation of those projects along with the support to prepare Second National Communication and future communications.

Bosnia and Herzegovina

The role of National Communications in Integrating Climate Change into National Planning

By: Ozren Laganin, Ministry of Physical Planning, Civil Engineering and Ecology of Republic of Srpska, BiH

Introduction

Overall experience in NC process and its contribution to the climate change policy development

Bosnia and Herzegovina became a party to the United Nations Framework Convention on Climate Change on December 6, 2000, and ratified the Kyoto protocol on April 16, 2007.

Upon finalization of the UNFCCC ratification process and the designation of GEF political focal points, activities in the field of environmental protection have been focused on organization of work that would enable BiH to become an active member of the UNFCCC as soon as possible under its designation as a "Non-Annex I Party." To this end, the country made significant efforts to initiate its work on preparation of the Initial national communication, since 2004, when it became eligible for GEF financial support. The country received funding through UNDP to finance preparation of the, "Self assessment for preparation of a Project Proposal for Preparation of Initial National communication of BiH to the UNFCCC." This document was successfully completed with full involvement of national experts, thus providing conditions for further GEF support for the NCs development process. The work on preparation of the INC started in 2008, and was finalized in October 2009, while the preparatory work on Second national communication (SNC) started in 2010, and will be finalized by the end of November 2012.

Before the NC process was initiated in Bosnia and Herzegovina, there was neither a strategic document nor a clear vision on the way to establish a comprehensive system for dealing with climate change, or on how to include policies and measures in all key economic and social sectors that contribute to and are affected by climate change. While the INC as a primary strategic document on climate change and sustainable development has indicated major constraints, challenges, priority needs by sectors and

recommendations for future actions, the SNC will provide further policy recommendations that support the country in meeting its obligations to the UNFCCC.

The main activities of the SNC include: Updating GHG inventory, proposing measures for mitigation, vulnerability assessment and adaptation, and providing updated socioeconomic and statistical data from different sectors, aimed towards supporting the country in the process of addressing climate change issues with its limited resources.

Following-up on the ongoing UNFCCC process, especially in relation to the current recommendations from the COP meetings, i.e. Bali action Plan and the Copenhagen agreements that impose new obligations on Non-annex I parties, who must now implement mitigation actions and report them to the Convention biannually through national communications in accordance with established monitoring and reporting procedures. Under these premises Bosnia and Herzegovina has initiated LEDS and NAS strategies jointly with its second national communication. These two strategies are carried out as a unified process with two separate outcomes, and represent a first step in achieving a transition to low emission development path. It is expected that upon its final adoption, a LEDS strategy, jointly with the appropriate system of Monitoring, Reporting and Verification (MRV), will allow access to the fast-start financing as well as long-term financing committed by developed countries in Copenhagen to support developing countries, inclusive the BiH, in implementing LEDSs and nationally appropriate Mitigation Actions (NAMAs).

Experiences highlighting the main lessons of the NC process

Up-to date experience in drafting NC's in Bosnia and Herzegovina has shown the following challenges and opportunities to be significant:

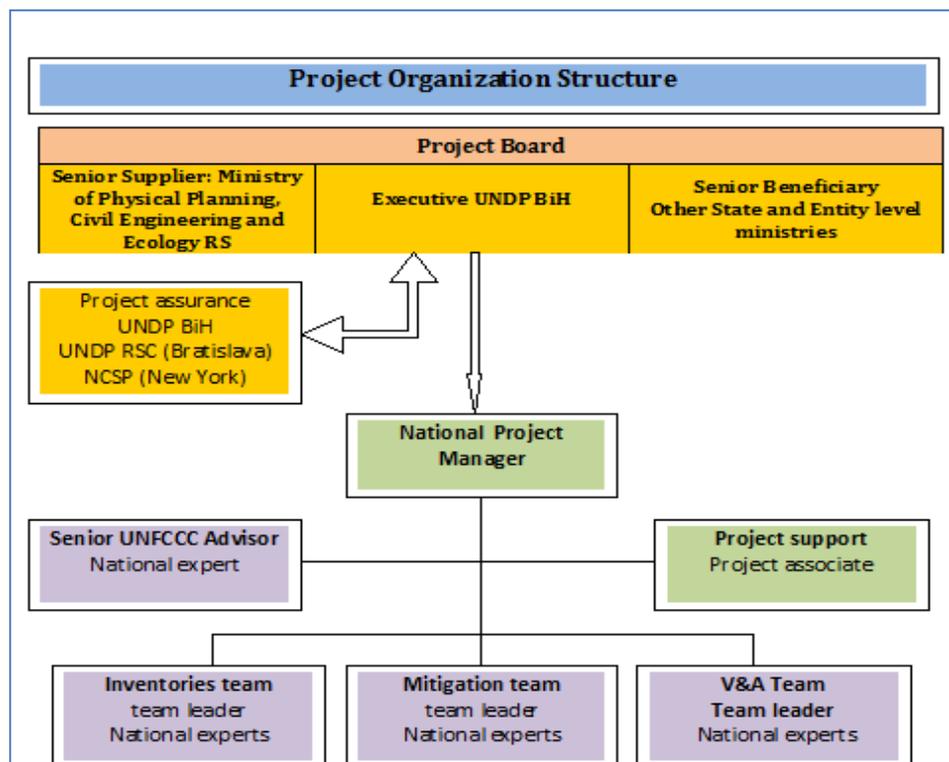
a) *The governance and institutional structure of BiH:*

Due to the division of administrative competences for environmental protection between entities of Republic of Srpska and the Federation of Bosnia and Herzegovina, District Brcko as a distinct self-government, and the state-level ministries, initial work on preparation of INC has required the establishment of specific organizational structure to manage the requirements of INC process. Recognizing the issue of multi-level coordination between governance bodies as one of the key obstacles to effective climate policy and concrete actions during the INC preparation process, Bosnia and Herzegovina's environmental authorities, together with the implementation agency-UNDP, paid due attention to implementation arrangements for the NC process. A core institutional structure in charge of bringing up common positions on relevant proposals prior to their official submissions was created with the support of the preparatory project: "Self assessment for preparation of a Project Proposal for Preparation of Initial National communication of BiH to the UNFCCC". The INC consisted of the following ad-hoc technical bodies: BiH Climate Change Committee, with 32 experts of different backgrounds from across BiH, the Sub-committee for climate change, with 10 members from relevant ministries, and the Technical Secretariat, consisting of 5 members. In addition to those ad-hoc bodies, the organizational structure of INC preparation involved the environmental Steering Committee (ESC), as a permanent body established by entity laws on environmental protection for coordination of all environmental activities among each entity and Bosnia and Herzegovina as a state, a BiH operational Focal Point and GEF political focal point. While the operational Focal point was in charge for the document endorsement and approval, the Ministry of Foreign trade and economic Relations, as a GEF political focal point, was in charge of the final document submission to the UNFCCC secretariat.

The GEF approved funding for INC in 2007, but due to the fact that the Climate Change Committee was not an official legal entity capable of organizing work and performing public procurement functions, the whole process of INC drafting was stalled for over a year, until UNDP took over the role of organization of work on INC preparation, in 2008. With adherence to Instruction 17/CP.8, UNDP jointly with the Focal point selected 45 experts in various fields for preparation of the INC. In addition to this expert team, acting as an independent pool, organizational structure has included: project coordinators, team leaders

for specific areas (GHG emissions inventory, Adaptation and Mitigation), the Project Board and the UNDP BiH support team. Similarly to INC, a group of domestic experts, most of whom were former members of the Climate change Committee, prepared the project document for the SNC. The organizational structure for preparation of SNC presented in *Figure 1* shows many similarities to the implementation arrangements for INC. The main differences between the two structures are in the reduced number of Project Board (PB) members for SNC (four PB members in SNC, versus 11 PB members in INC), the strengthening of the experts work, and assistance of experts from the UNDP branch offices.

Figure 1. SNC Implementation Arrangements



Source: project document for “Enabling Activities for the Preparation of Bosnia and Herzegovina’s SNC to the UNFCCC”, July 2010

The project board, comprised of representatives of all key national stakeholders, is in charge of the overall project coordination. The Project Board plays a critical role in project monitoring and evaluations by ensuring the quality of the processes and products, and using evaluations for performance improvement, accountability and learning. UNDP was available to support the Implementing Partner through the provision of procurement, recruitment and contracting processes upon request of the Implementing Partner. The Implementing Partner for this project is BiH National UNFCCC Focal Point, i.e. Ministry of Physical Planning, Civil Engineering and Ecology of Republic of Srpska.

The Implementing Partner, under close supervision of the UNDP BiH Country Office, holds the overall responsibility for the production of project activities. UNDP is in charge of the project funds management on the basis of a detailed work plan and available budget.

b) GHG data availability and projections

Common findings of the NC process in BiH were that-except for the base-year emissions data for 1990, which are officially published- other GHG data exhibited different levels of discrepancies, and also showed that there is a need for inclusion of adequate socio-economic parameters in order to achieve good quality modelling. Future work on quantification scenarios, particularly in the areas of district heating and buildings, will require a more systematic approach and mobilization of additional financial resources.

c) Roadmap towards EU membership

The roadmap towards EU membership of BiH still includes two major areas of uncertainty: the pace of public administration reform and the approximation of the legislation with the EU Acquis communautaire. The timeline of the acceptance process, which is crucial for obligations related to GHG emission reduction requirements, is therefore difficult to predict, but the most probable scenario is that under the second commitment period of Kyoto, BiH would remain a non-Annex I country, with no legally binding emission reduction commitment and benefiting from the mechanisms and funding aimed at helping developing countries. However this does not exclude the possibility of voluntarily undertaking emission reductions (deviation from the BAU).

On the other hand, future developments of the international climate regime, especially after the Durban conference, under UNFCCC are undergoing significant changes and it is hard to predict what the regime will be like after 2020. Bearing in mind the aforementioned uncertainties, development of future low emission development strategies should provide a general roadmap towards full EU membership and an “Annex I type” regime sometime after 2020. Until that time, the Strategy should maximise the utilisation of the available capacity building, technology transfer and financial mechanisms. These include the CDM mechanism and Green Fund (most probably operational in the period till 2020) as well as EU pre-accession funds. It is important to note, that tapping these financial mechanisms will only work well if climate change objectives and projects are well integrated into the national economic development policies and strategies in sectors such as poverty alleviation, energy, transport, industry etc.

Assuming that the framework related to the EU trading scheme remains the same, when BiH enters the EU, its cap for ETS will be set based on historic emissions in the ETS sector and non-ETS reduction targets will be set based on applicable criteria, including the level of overall development. An important framework for moving towards the ETS system is the treaty on the European “Energy Community” recently signed by the countries in the SEE region (Albania, Bosnia and Herzegovina, Kosovo, Croatia, Macedonia, Montenegro and Serbia) and the EU. Under this treaty, signatories agree to implement selected EU legislation, including the Large Combustion Plants Directive (LCPD – 2001/80/EC) from 2018 onwards and the Directive on Sulphur Content in Liquid Fuels (1999/32/EC) from 2012 onwards. The treaty provides the framework for coordinating the energy policies of the SEE countries with the EU.

Overview of the ways showing how the LEDS strategy development and associated MRV system will provide inputs for climate change integration

Considering the options for implementing low emission development strategies with the Nationally Appropriate Mitigation actions (NAMAs), both domestically and with the international support, Bosnia and Herzegovina can initiate their first steps through the support provided for the development of the Second National Communication, but the capacity building effort in this respect will have to continue in order to achieve GHG emission reduction measures. According to one of more recent surveys, “assessment of capacities for low-carbon and climate resilient development for Western Balkan countries” (UNDP, May 2011), confirms the need for improved capacity building among the government institutions to improve sustainability in preparation of NCs, and in the creation of new policies that would enable them to participate in global efforts to reduce emissions, and in the emission trading mechanisms. SWOT analysis for performing actions on mitigation under the SNC, has shown human resources to be one of the major strengths, while finding that poor experience and lack of institutional capacity may lead to failure in meeting environmental requirements and slowing down the process of EU integration, which may result in BiH getting stuck in the present unsustainable development pattern.

The implementation framework for the future LEDS strategy, should therefore take into consideration two possibilities: (i) providing the necessary capacity building and coordination of institutions and (ii) developing NAMAs as much as possible in such a way that they will not critically depend on the government institutions. This may mean that preference will be given to actions involving the private sector, public private partnerships, local communities and NGOs. It also seems that very little funding from domestic public sources will be available in the foreseeable future. The financing of actions will

have to be structured between private sector (population, companies, and banks), “classical” donors, and EU funds as they develop in the process of accession and for some time through financial mechanisms under UNFCCC.

Due to uncertainty regarding the current level and future projections of GHG emissions, it is very challenging to set a meaningful mitigation objective in terms of quantitative emission reductions compared to the base year 1990. As far as qualitative actions, areas with the largest potential for mitigation actions, In accordance with the findings of the SNC, are: electricity production, energy efficiency in buildings, heating and transport, and to a certain extent waste management, forestry and agriculture. There are two areas for mitigation in the area of electricity production: improving the efficiency and cutting GHG emissions from coal extraction and thermal power plants, and in the field of renewable energy sources (RES). Total mitigation potential of the electricity production sector is thus between – 3,62Mt and 6,09MtCO₂eq annually by 2025, depending on the installed capacity of new thermal power plants. Without thermal power, the mitigation potential is 1,29Mt.

According to the Copenhagen Accord, mitigation action taken by non-Annex I Parties (unilateral NAMAs) will be subject to their domestic monitoring, reporting and verification (MRV) procedures and reported on every two years through the national communications on the basis of guidelines to be adopted by the Conference of the Parties. Provisions are to be made for international consultations and analysis under clearly defined guidelines that will ensure that national sovereignty is respected.

In order to support and contribute to the global imperative to stabilize the concentrations in line with 2 degree temperature increase scenario, BiH should transition to a low emission development path, and as a first step develop a Low-Emission Development Strategy.

This strategy will allow access to fast start financing as well as long-term financing committed by developed countries in Copenhagen to support developing countries, inclusive the BiH, in implementing LEDSs and NAMAs. Because of the economic and institutional circumstances, the following criteria should guide the prioritisation, design and selection of the proposed mitigation measures in Bosnia and Herzegovina:

- Ensuring Co – benefits (poverty alleviation, meeting EU standards)
- Ensuring Cost effectiveness
- Availability of private capital or international funding for investment
- Absence of institutional and/or administrative barriers.

The listed measures can each best be implemented at appropriate level. The fuel price and car taxation policy, for example, has to be regulated at the central level; public buildings might best be rehabilitated at the municipal level, while home energy efficiency can be promoted with individual persons or families.

The individual measures can be presented as Nationally Appropriate Mitigation Actions (NAMAs) under the the UNFCCC. According to their characteristics they should be divided into:

- Unilateral NAMAs – policies and actions that BiH will implement on its own and do not require international assistance
- Donor assisted NAMAs – measures and projects for which BiH will seek support of other UNFCCC parties and will be subject to MRV
- Creditable NAMAs – not yet formally agreed for the period 2012 – 2020, these would be projects that generate emission reduction credits that can be traded in the international carbon market (e.g. CDM), attracting private investment or investment under flexible mechanisms.

Conclusion

BiH is in the process of EU accession, and during this process, the key challenge is to move towards a low carbon economy by reducing GHG emissions while achieving the objectives of rapidly improving the economic situation and social cohesion. The NC process has contributed significantly to the overall process, as both, initial and second national communications have contributed to achievement of the

national environmental objectives through: a) improved ability of the country to participate actively in addressing the global environmental threat of climate change; b) assistance in developing capacity in climate change-related research and analysis that can support effective environmental policies and provide important data related to environmental challenges to sustainable development in Bosnia and Herzegovina that go beyond climate change; and c) providing improved information and analysis for policies in key areas, such as water resources, agriculture, and human health.

The SNC drafting process has confirmed insufficient coordination between institutions competent in environmental protection, and the need for establishment of better connections between governments and researchers as one of key threats to improved climate change actions in Bosnia and Herzegovina.

Due to the countries traditional dependence on the lignite fired thermal power units, some future growth of emissions is inevitable, but it also means that moving straight to more sustainable patterns of production, consumption and lifestyle rather than just copying the already obsolete patterns of the EU of the past decades may be economically and socially desirable. BiH should pursue both tracks up to 2025, thereby securing energy security with more efficient coal fired power plants while increasing the share of renewable energy that can then take over in the period leading to 2050. New investment in coal is also justified by the economic dependence of current coal mining regions on this industry. In present economic situation BiH doesn't have resources to restructure these regions as the existing thermal power plants reach their end of life.

For countries such as BiH post-2012 reporting requirements are essentially related to two core areas:

- The national emissions, including monitoring of domestic policies and measures
- Implementation of specific nationally appropriate mitigation measures (NAMAs).

For the first time, developing countries will be required to submit biannual reports, containing updates about their national greenhouse gas emissions, including the greenhouse gas inventories and the national inventory report, information on mitigation actions, needs for support and support received. The biannual reports will be subject to International Consultations and Analysis (ICA) under the Subsidiary Body for Implementation.

Any mitigation actions implemented by developing countries will be subject to monitoring and review. Domestically supported mitigation actions will undergo domestic measuring, reporting and verification (MRV), while internationally supported mitigation actions will require international MRV, the guidelines for which are yet to be developed. At the same time, BiH attracts investment in its renewable potential. Here biomass, hydropower and wind are already commercially viable and photovoltaic energy should be competitive without public subsidies before 2020. The recommended LEDS strategy should therefore aim at mobilising different forms of international investment in energy efficiency in buildings, sustainable transport, new generation of thermal power plants and renewable energy sources for both heating and electricity production.

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The Gambia

Mainstreaming Climate Change in The Gambia's Programme for Accelerated Growth and Employment (PAGE)

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Introduction

The Gambia, lying between latitudes 13 and 14 degrees North and longitudes 17 and 12 degrees West, is the smallest country on the African continent. It has a total area of about 11,300 km² of which 10,000 km² belong to land and 1,300 km² is water. The Gambia has a total land boundary of 740 km, all of which is shared with the Republic of Senegal. On its western boundary, the country has an 80 km open coastline of which 11 km represents the mouth of the River Gambia. Maritime claims include a contiguous zone of 18 nautical miles and an exclusive economic zone (EEZ) of 200 nautical miles. The Gambia sits on the flood plain of The Gambia River flanked by savannah and low hills. The lowest point is at sea level and the highest point, unnamed, is 53 meters above sea level.

The government of The Gambia is committed to reducing poverty and improving the well-being of citizens. This commitment is driven by the government's long-term strategy, Vision 2020, which is being pursued through a series of medium-term development plans. The most recent, the Programme for Accelerated Growth and Employment (PAGE) is The Gambia's development strategy and investment programme for 2012 to 2015. PAGE comes on the heels of the Poverty Reduction Strategy Paper II, PRSP II (2007 - 2011). In terms of poverty reduction and improvements in social welfare, successful achievement of the first and second poverty reduction strategies was attenuated due to external shocks and the lack of financial resources. Overall, significant progress was achieved in the social and infrastructure sectors but income poverty still remains a challenge.

The PAGE (2012-2015) draws on lessons learnt from previous poverty reduction strategies. The PAGE is thus aligned with Vision 2020 and sectoral strategies, and epitomizes the execution template for The Gambia government's long-term vision. Consistent with the Paris Declaration on aid efficiency and the ownership of development, the PAGE acts as the main interface between The Gambia and its development partners. PAGE is fully aligned with the Millennium Development Goals (MDGs) and climate change issues and risks have been fully integrated in it.

There is a fine line of distinction between integration and mainstreaming processes and in this document the words are interchangeable. However, mainstreaming process is assumed to include integration process. The rationale for mainstreaming climate change into development is based on the fact that many of the interventions leading to enhanced climate change resilience generally incorporate or are in line with the main development objectives. Responses to climate change challenges require the development of human capital, strengthening of institutional systems, and sound management of public finances and natural resources. Such processes build the resilience of countries, communities, and households to all shocks and stresses, including climate variability and change, and are good development practices in themselves.

Mainstreaming climate issues into national development policies ensures consistency between the needs of climate change responses (mitigation and adaptation) and poverty eradication. Separation of the two runs the risk of climate change mitigation and adaptation policies inadvertently conflicting with development and poverty policies, or conversely, development policies inadvertently increasing

vulnerability to climatic factors. Accordingly, this issue is critical to the successful eradication of poverty and needs to be placed at the core of national development processes.

In mainstreaming climate change into development frameworks, experience has shown that the process should start with integration of climate change into the main National Development Policy of the country. This could be the VISION, Poverty Reduction Strategy Paper (PRSP) or the most recent variations such as the Programme for Accelerated Growth and Employment (PAGE) of The Gambia. Development and integration of climate change into such a National Policy document will enable review of policies, plans and programmes at the sectoral and local levels as discussed in subsequent steps.

Experiences, main lessons and challenges in using the National Communication process

Based on our level of involvement and participation in the National Communication process, it was relatively easy to gather data and information from the First and Second National Communications of The Gambia that will serve as input into the process of mainstreaming climate change into the Gambia Page document.

The UNFCCC National Communication process has also evolved with time and effective participation in the process has enabled individuals to have broad knowledge and understanding of national circumstances; institutions; national and sectoral policies, strategies and plans; and development trends to enable mainstreaming of climate change.

The major challenge of the National Communication process in The Gambia is the frequency of preparation of the National Communication document. This challenge is also compounded by data gaps and unavailability of other information that serves as input into the national communications process. The data required for inventory of greenhouse gases, for example, is not easily available and the inventory development is based on the year that has the most complete data. Hence, the Second National Communications of The Gambia, to be published in 2012 is using 2000 inventory data. The result of that inventory is used as input into the mainstreaming of climate change into the PAGE.

Approaches to Mainstreaming Climate Change into Development Frameworks

This section attempts to present the approaches and the processes involved in the mainstreaming of climate change issues into national and sub-national (regions, districts and community levels) development frameworks. For mainstreaming to be effective, it should be infused into all levels of the planning frameworks in particular (e.g. policies, plans, programmes, projects, etc.) while at the same time permeating the different stages from conceptualization and identification, design, appraisal, budgeting, implementation, to monitoring and evaluation. Figure 1 shows the various levels of mainstreaming climate change concerns into development frameworks.

The under-listed steps serve as a guide in the integration of climate change risks and responses (mitigation and adaptation) into National Development policy and planning processes. Steps 1 to 4 are common to the process of integration of climate change into the Main National Policy (e.g., the Gambian PAGE) and also to sectoral and local level policies, plans and programmes.

Step 1: Preparatory Phase of Mainstreaming Climate Change

The preparatory step sets the stage for mainstreaming climate change, focusing on activities designed to help countries identify entry points into the development planning process and to make a strong case about the importance of mainstreaming of climate change. The initial step consists of understanding the governmental, political and institutional context relevant to climate change risks, responses (mitigation and adaptation) and challenges (barriers) to mainstreaming climate change into development frameworks. At this stage it will be good to know if the Country is a Party to the Convention and its Kyoto Protocol, which Ministry is leading and coordinating the implementation of the Climate Change Convention, does a National Climate Committee exist and what is the status of implementation of the Convention at the national level. It is also important to know if a Climate Change Strategy already exists. At this stage it is essential to decide on which institution should lead the mainstreaming process. The

main candidates are the Ministry responsible for implementation of climate change Convention at national level, Ministry of Finance and Economic Affairs, the Office of the Vice President and the Office of the President. All these four Government institutions have their merits and demerits in leading the mainstreaming process and it is important that all key stakeholders are aware and involved in the final decision of the selection of the Lead Institution for the climate change mainstreaming process.

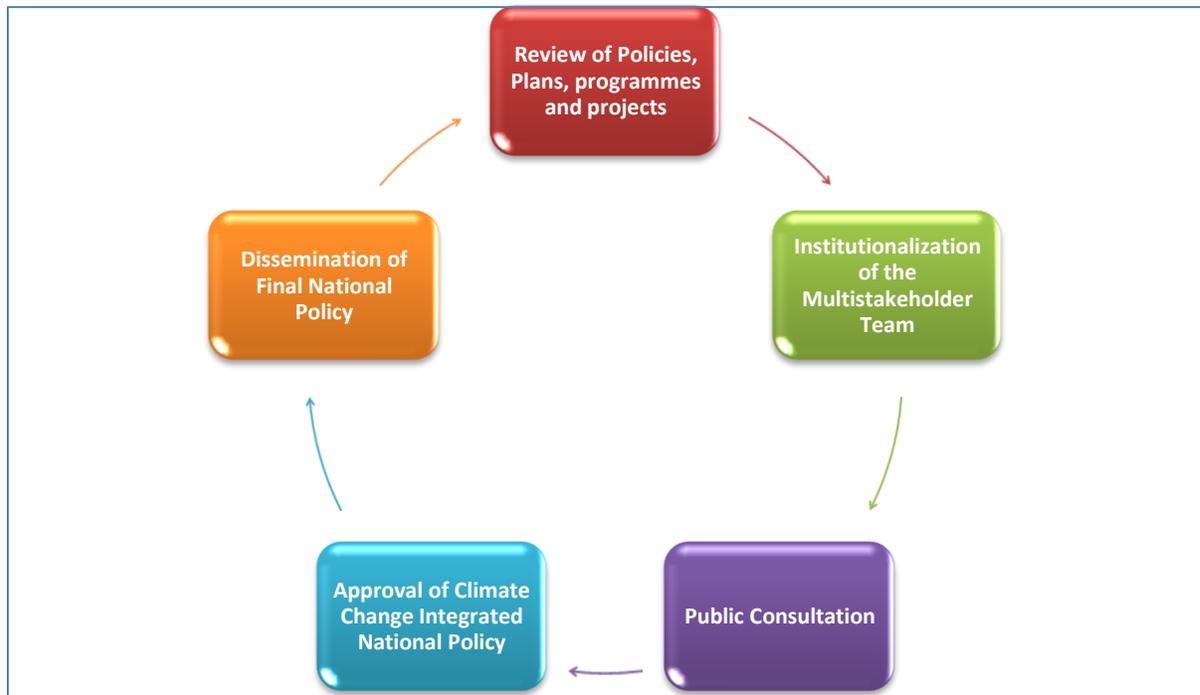


Figure 1: Mainstreaming climate change into National Policy and Planning Process (UNEP, 2007)

This First Step will also consider the climate change situation in the country and the human, financial and institutional capacity needs for mainstreaming climate change into national development frameworks. The first requirement for mainstreaming climate change is awareness of the stakeholders about climate change risks.

Climate change and its potential impacts/risks should thus be brought into discussions on poverty reduction, pro-poor growth and national development, in order to raise awareness on the links between these issues. Decision-makers might then accept to continue the effort by:

1. Identifying the most vulnerable sectors of the economy to current and future climate change;
2. Integrating adaptation and mitigation into policies; and
3. Strengthening human and institutional capacities.
4. There is also the need to network climate change experts and development practitioners and build partnerships between institutions that can act as intermediaries between science (including socio-economics) and policymaking are paramount.

Step 2: Institutionalization of a Multisectoral and Multidisciplinary Team (MMT) tasked to Mainstream Climate Change into the development

Competent and committed representatives from all Ministries, Departments and Agencies (MDAs) of central government, professional bodies, tertiary institutions, non-governmental (development) organizations (NGO), community-based organizations (CBO), development partners, private sector, and other specialized institutions and outstanding individual professionals in related fields should be selected to be part of the Team. The Team should be provided with the Regulations/Acts, Policies, Strategies, Plans and other national, regional and international policy documents that will be relevant to

Gambia's policy formulation process. Members of the Team will be required to have their sector and institutional policies for consideration and inclusion. Other strategic partners including NGOs, Academia, etc. will also be required to share their field experiences to enrich the available data and information, discussions and output.

The Team should also be trained on climate change issues including the country's contribution to the build-up of greenhouse gases into the atmosphere, resultant global warming and climate change, impacts of climate change on the national economy and sectoral activities, and on-going recommended actions (mitigation and adaptation) to face the challenges of climate change.

Step 2 of the climate change mainstreaming process will produce a competent Team that has received knowledge and capacity to take climate change issues into consideration during the execution of the task of mainstreaming climate change.

Step 3: Desk review of policies, plans, programs and projects

During this step the selected Team is capacitated to mainstream climate change into development frameworks and conducts an assessment of current and relevant policies, plans, programmes and projects with the objective of identifying gaps and proposes new initiatives that take climate change into consideration. Consideration is given to concerns, challenges and recommendations already framed in existing climate change reports such as the National Communications (NATCOM), National Capacity Self Assessment (NCSA), Technology Needs Assessment (TNA) and the National Adaptation Programme of Actions (NAPAs), just to name a few.

The Team should also review all Local (Village and District Development Plans), sectoral (Agriculture, Energy, Water, Fisheries, Forests, etc), national (VISION, PRSPs, UNDAFs, etc), regional (ECOWAS, CILSS, UMOA, NEPAD, etc.), and international policy frameworks such as the MDGs, and the vision of Post 2015 development agenda and include cross-cutting issues such as gender, youths, etc..

The major output of this step is the baseline data and information to be able to inform and further guide the process of mainstreaming climate change into development frameworks. The review process identifies the impact of climate change on the level of achievement of policies, plans, programmes and projects. It sets the stage for engaging relevant stakeholders into a comprehensive consultation process.

Step 4: Public Consultation and Sensitization

The public consultation and sensitization involve organization of scoping meetings, workshops and seminars for various stakeholders including the Executive, Legislature and Judiciary arms of Government; Experts and professionals in the Public and Private sectors, Local Government Authorities, Civil Society Organizations (NGOs, CBOs, etc.), Traditional Authorities and grassroots level communities. The main objective of this public consultation and sensitization is to have a two way learning process where the public is informed and educated on climate change and its impacts on the national and sub-national economy, the potential responses (adaptation and mitigation options), the role of all state actors and the public in facing the challenges of climate change and the issue and requirements of mainstreaming climate change.

Stakeholders participating in the consultation process will also be informed of the public experiences particularly of grassroots level communities that have faced previous and similar climate change risks and the coping strategies employed by them. The outputs of the consultation process include comprehensive baseline data and information and a well informed population that is ready to use all means available to them in mainstreaming climate change into their day to day participation in national sub-national socio-economic development.

Conclusion

The initial step of mainstreaming climate change into development consists of understanding the governmental, political and institutional context relevant to climate change risks, responses (mitigation

and adaptation) and challenges (barriers) to mainstreaming climate change into development frameworks. At this stage it is good to be able to answer questions such as: Is the country a Party to the Convention and its Kyoto Protocol? Which Ministry is leading and coordinating the implementation of the Climate Change Convention? Does a National Climate Committee exist? What is the status of implementation of the Convention at the national level? This step also considers the climate change situation in the country. Climate change and its potential impacts are thus brought into discussions on poverty reduction, pro-poor growth and national development, in order to raise awareness on the links between these issues. At this stage the decision-makers awareness should be higher and then they might accept to continue the efforts, for example by identifying the sectors the most vulnerable sectors of the economy to current and future climate change, and help integrating adaptation and mitigation measures into policies and could also help strengthening human and institutional capacities.

All these pre-requisite data and information are available under the National Communications process. The National Communication process is thus able to provide all the prerequisite data and information for mainstreaming climate change into development frameworks. To complete the mainstreaming process an assessment of current and relevant policies, plans, programmes and projects is conducted with the objective of identifying gaps and propose new initiatives, development plans, programs, policies and frameworks that take climate change into account. Consideration is then given to concerns, challenges and recommendations given in existing climate change reports such as the National Communications.

The assessment will identify how climate change has been included in policies, plans, programmes and projects. The expected output could serve as baseline data and/or information that will inform and further guide the process of mainstreaming climate change into development frameworks. It will set the stage for engaging relevant stakeholders into a comprehensive consultation process.

Montenegro

The National Communication, a Step towards a Low Emission Resource Efficient Economy

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Initial Communication, Challenges, Barriers and Achievements

Achievements

The Initial National Communication of Montenegro (INC) to United Nations Framework Convention on Climate Change (UNFCCC) was completed in 2010 and it is perceived to be a true milestone for Montenegro. It is considered as a milestone due to the fact that no similar research has been done before and also the fact that a wide array of institutions and individuals from different sectors were involved in the preparation. It is a milestone because it constitutes an important document in reference to climate change policies while Montenegro is still working on developing its climate change legislation. Therefore the INC proves that the process of developing National Communications goes beyond reporting and encompasses much broader scope. Since Montenegro has worked to incorporate ideas of sustainable development into various pieces of its development plans and is working to become an EU member state which would entail even more obligations related to climate change, the INC of Montenegro provide overview of the situation in different sectors which are, or may be, impacted by climate change. Reoccurrence of severe weather events, significant economic and infrastructural damage interlinked with the complex social situation in the country is driving the government looking for options how to manage the problems and find possible solutions for coping with the changing climate. Hence, preparation of the Initial National Communication was important for addressing these issues. Following up on results of the INC, the Second National Communication should not only support the country in meeting its obligations as a UNFCCC signatory but should also serve as a significant strategic

document for sustainable development.

UNDP managed the INC process with the oversight of the Project and the Advisory Boards, where the project board consisted of members from the Ministry of Spatial Planning and Environmental Protection, the Hydro-meteorological Institute, and from UNDP, while the advisory board consisted of a number of stakeholders in various sectors. The document was developed by more than 40 individuals, predominantly through work of national and international consultants, with the involvement of national institutions what resulted in large degree of country ownership of the document.

Constraints

During the process of compiling the INC the expert teams were able to identify main constraints which concerned the **lack of data** and **insufficient capacity for the calculation and estimation of GHG emissions** and the **lack of information and knowledge about vulnerability and adaptation to climate change**. By the end of the project, the final INC report was prepared, data gaps were identified and need for additional data in specific areas were highlighted, stakeholders have become more educated about climate change and the potential importance of climate change related issues in their sectors, and the capacities among Government stakeholders has grown³.

Following up on the identified constraints, the Montenegrin Government: i) has secured capacity building of EPA staff in calculation and estimation of GHG emissions through bilateral agreements and the SNC is supporting further capacity building of EPA staff and benefiting from it by transferring responsibility for updating of the GHG inventory to EPA, ii) implemented the Montenegrin Technical Needs Assessment for Climate Change project through bilateral cooperation, addressing lack of information and knowledge about mitigation, vulnerability and adaptation to climate change. Building up on the progress at national level, parallel implementation of the Second National Communication project and the Environmental Management Information System project (EMIS project), will support and further strengthen institutional capacities to overcome constraints identified in the INC.

Montenegro and the Second National Communication process

The organizational challenge for a developing country like Montenegro is to prepare documents such as the National Communications to UNFCCC, Technical Needs Assessment, National Appropriate Mitigation Actions (NAMAs) formulation and integration of EU legislation and policies into national framework, in a way to avoid overlapping and duplication of efforts, to ensure coordination of work among different sectors, and enable establishing streamlined, interlinked and compatible processes. In order to do so, development of a well designed strategic framework for addressing climate change issues in Montenegro is a necessity, and the SNC project will be contributing to developing such a framework.

The interlinked nature between the climate change, depleting resource base, socio-economic crises and natural disaster has made the Government search for adequate mitigation and adaptation measures and also to realize and recognize that there are as well new opportunities that climate change carries. Therefore Montenegro's response to climate change is transition to a low emission, resource efficient economy and the SNC project together with the EMIS project will be used as one of the responses since the two projects will generate tools, instruments, data, new institutional capacities which will facilitate transfer of Montenegro into a "green economy". While the SNC project is addressing the national GHG inventory, mitigation measures and vulnerability and adaptation measures, the EMIS project will develop a national list of environmental indicators and an environmental management information system design.

The two projects, EMIS and SNC are managed by UNDP, and implemented in parallel under the umbrella of an environmental monitoring programme and are monitored/ coordinated by one, common, steering committee and supported by one, common, advisory board. This approach is especially beneficial for the

³ Project Document "Enabling Activities for the Preparation of Montenegro's Second National Communication to the UNFCCC", 2010, UNDP Montenegro.

process of development of the SNC, because the Government of Montenegro is not yet able to take on the task of managing the entire Second National Communication (SNC) process independently. Strength of such an organizational setting is crucial for: i) better coordination of activities and data – outputs of one project are inputs to the other project and vice versa; ii) better response to Government needs related to environmental monitoring while saving resources and time; iii) efficient linking of activities to the national institutions and transferring responsibility to relevant institutions, agencies and ministries; iv) Strengthening institutional capacities – mobilizing inter-sector and multi-sector teams for related activities of both projects; v) secured transparency of projects implementation and ownership over projects result, etc. By implementing these two projects UNDP is supporting further efforts towards the institutionalization of work on the National Communications, and is as well developing capacities for monitoring and reporting on all elements of the Communication, and also strengthening the awareness of climate change on all levels and mechanisms for the formulation of integrated responses to climate change.

Mitigation and adaptation to climate change – challenge and opportunity

Since adaptation chapter of the SNC will investigate vulnerability of different important economic sectors to climate change, the mitigation chapter is searching for opportunities that investment in mitigation technologies might influence, such as decreasing GHG emission, avoiding costs in different sectors with emphasis in the energy sector and energy consumption, new employment opportunities, etc. Challenges related to mitigation of climate change in Montenegro are: steady increase of energy prices on national and global energy markets but still remaining a country with high energy consumption and the related CO₂ emissions at the national level, small economy and weak investments in mitigation technologies. Challenges related to adaptation to climate change in Montenegro are: financial losses due to severe weather events and related environmental, human, and infrastructural damage, complex socio-economic situation and related unemployment issues, etc. Therefore, the SNC and EMIS projects are assisting Montenegro's Government in a swifter market transformation towards low emissions and resource efficient economy by providing relevant data for different sectors, analyzing options and solutions for diversification of energy supply and looking into feasibility of investing into different mitigation technologies which will all contribute in decreasing GHG emissions and related carbon footprint of analyzed sectors.

In the INC it was already identified that a basic characteristic of the energy sector in Montenegro is the high intensity of energy consumption, due to a dominant share of industrial consumers in total consumption, inefficiency of energy consumption in the household sector and services and increase in the number of vehicles and thus increasing consumption of motor fuels. In line with this, Montenegro energy sector was identified in the INC as the economic sector with the highest CO₂ emission with 92% share from the total direct gas emission by economic sectors. Montenegro today is witnessing steady increase of energy prices (power and fuel) at the local market and considering the clear signals and predictions of the global energy market on further increase of power costs in the next couple of years, interest in investment in Energy Efficient measures and in RES in Montenegro is expected to increase accordingly. Therefore, mitigation activities in energy sector of the SNC project are priority, and following on results of the two scenarios of development of consumption and manufacturing capacities for the period 2010-2025 done in frame of the INC, UNDP Montenegro together with UNEP prepared a study which assessed the impacts of greening Montenegro's economy through increase in energy efficiency of the building and transport sectors and promoting domestic supply chains in the tourism sector. The study showed that the Green Economy interventions analyzed could effectively reduce energy consumption and associated GHG emissions, also reducing energy expenditure in all sectors analyzed, while creating employment⁴. Furthermore, the collected data for energy sector allowed the

⁴ UNDP/UNEP study "Assessing the impact of green economy investments in Montenegro: a Sectoral study focused on energy (transport and buildings) and tourism" 2012, UNDP Montenegro : "The cost of improving energy efficiency by 12% by 2020 in transport and construction by €66,2 million, resulting in over €100 million

Government to join the global initiative “Sustainable Energy for All” led by UN Secretary General and to fill-in the questionnaire and provide relevant information about the energy sector in Montenegro. Following the same trail and looking into findings of the “Technical Needs Assessment for Climate Change” project⁵ conducted by the Ministry of Sustainable Tourism, Montenegro’s National Appropriate Mitigation Actions report (NAMAs) will contain information about existing projects/studies which are addressing adequate mitigation measures for the analyzed sectors (energy, industry, waste, agriculture and LULUCF). With this, NAMAs will be a strong support to the Government in the process of market transformation toward a low emission, resource efficient economy. Having all this in mind, investment in mitigation can be seen as an opportunity for creation of new business and opening new market niches for services and products which haven’t been present before (investments in energy efficient technologies and in renewable energy sources), decreasing dependency from energy import, generating of new jobs and decreasing the level of unemployment, saved income through utilization of EE technologies and related positive effect to the socio-economic situation in Montenegro. New challenges call for adequate solutions, therefore it is expected that investments in knowledge and innovations will be supported.

Models will be developed and analytical methods will be utilized under the vulnerability and adaptation component generating new data (including GIS data) that will provide projections on possible impacts of climate change on the analyzed sectors (energy, coastal area, water, tourism and biodiversity, agriculture, forestry, public health). Development of models will be done in close cooperation with relevant national institutions in different sectors providing capacity building of these institutions and securing sustainability of the models. Having in mind the high unemployment rate (especially in northern Montenegro) and the increased exposure to variety of disasters and unsustainable and inadequate exploitation of natural resources, increased vulnerability of the country’s economy, environment and communities has become more evident. Therefore, the adaptation component will look into options/ solutions/ possibilities that the Government can use to strengthen the resilience of the ecosystem, economies and communities, and in parallel will contribute to generation of new data and filling the information and knowledge gaps about vulnerability and adaptation to climate change. The newly developed national environmental indicators contain baseline information and data for almost all of the above mentioned sectors what is securing bases for further analysis. Expected results of this component, such as a cadastre of hydrological resources, a model of sea level rise on the coast line, a biometric forestry model, etc., will be something Montenegro never had before and the EMIS will be a great asset in the process making the results available to all relevant institutions and agencies, it will enable addressing cross-cutting issues in different sectors (regional development, disaster risk reduction, national parks, ecosystem service evaluation, etc), allowing strengthening of existing and establishing new links between related institutions and agencies for a faster and more efficient response to climate change through employment of adequate adaptation measures. All the more, it will support opening data to the public and invite citizens for more active involvement in environmental monitoring, protection of natural resources etc., by using, inter alia, open media options (twittering, blogging, etc).

Throughout the SNC project UNDP will continue to make efforts towards the institutionalization of work on the National Communications and to develop capacity for monitoring and reporting on all elements of the Communication, to strengthen the awareness of climate change on all levels and mechanisms for the formulation of integrated responses to climate change. The novelty of the SNC is that in the last three years EPA Montenegro managed to develop its capacities for revising the national GHG inventory

savings/avoided costs and over 25% reduction in GHG emission. The cost of achieving a more ambitious goal, energy efficiency improvements of 20% by 2020 in the same two sectors is €144 million, resulting in savings/avoided costs of over €170 million, and a reduction of over 40% of GHG emissions. 370 - 730 full time direct jobs by 2020 may be generated in tourism while indirect employment creation could reach up to 16,000 jobs in sectors involved in tourism’s supply chain.”

during the INC project and the capacity for building programs supported by bilateral donors on preparing the national GHG inventory for UNFCCC and for the Convention on Long-Range Trans-boundary Air Pollution (LRTAP). Therefore it is decided that EPA Montenegro takes over full responsibility for development and revision of the national GHG inventory for the time frame 1990-2011. The SNC project is supporting further capacity building of EPA staff for revision of the GHG inventory and it will deliver necessary technical support to EPA during the entire process. While until 2012 only one person in EPA was responsible for the GHG inventory, one of the results of SNC project is the establishment of a team of three people in EPA Montenegro who will from now on be responsible for revising the GHG inventory. This institutional capacity building represents a major achievement of the SNC process. The same approach of transferring the responsibilities for development of different parts and chapters of the National Communications to the government institutions and moving away from outsourcing as much as possible will be replicated and used in the future.

Montenegro has no strategic climate change document neither one government body which represents a steering committee for the climate change actions. For efficient implementation of all planned activities within the climate change area Montenegro needs both. Establishment of good institutional cooperation can be achieved through the SNC/EMIS project due the project board consists of representatives from the Ministry of Sustainable Development and Tourism, Hydro-meteorology Institute, EPA Montenegro, Ministry of Economy and UNDP, and the advisory board consists of representatives of all relevant institutions, agencies and representatives of civil sector. Mobilization and active involvement of institutional capacities in inter-sectoral and multi-sectoral working teams has shown positive effects to projects implementation, such as better quality of outputs (studies, reports), it supports dialog between experts in related and in different sectors and it is strengthening national expert network, it secures national ownership over the final report and over all outputs developed within the project. This approach can serve as positive example in designing and establishing of a future governing body for climate change.

Conclusion

Preparation of the SNC report will be a challenge for Montenegro. Even with active involvement of UNDP in preparation of the document it will be a complex process for the understaffed Government. Therefore, collection of data and strengthening national capacities in preparation of further national communications will remain a priority during the SNC and EMIS projects implementation. The GHG inventory team in EPA will be strengthened and inter-sector knowledge exchange and collaboration will be continuously supported. However, the SNC will not only support the country in meeting its obligation towards UNFCCC but will also serve as a significant strategic document for a swifter market transformation towards a low emission, resource efficient economy and it will contribute to the efforts in strengthening the resilience of ecosystems, economies and communities to climate change. Analyses conducted so far have shown a glimpse of benefits and opportunities Montenegro has from climate change. The projects are at the beginning of their implementation but by providing tools, guidance, data, and by strengthening institutional capacities in identification and utilization of opportunities that mitigation and adaptation measures carries, the SNC and EMIS projects will support Montenegrin Government in coming a step closer to a 'Green Economy'. By developing the capacity for research and analysis related to climate change, addressing key issues and providing key information for developing policies/ programmes related to climate change (including recommendations for mitigating for and adapting to climate change), SNC project together with the EMIS project will support the Government in making the most efficient use of limited resources to address climate change issues.

Uruguay

The National Communication Process and its Contribution to the Integration of Climate Change into the National Development Agenda

IN SPANISH

By: Unidad de Cambio Climático, DINAMA MVOTMA, URUGUAY

Introducción

La República Oriental del Uruguay ratificó la Convención Marco de las Naciones Unidas sobre Cambio Climático (CMNUCC) por la Ley Nº 16.517 del 22 de julio de 1994 y el Protocolo de Kioto por la Ley Nº 17.279 del 23 de noviembre de 2000.

Según la Ley General de Protección del Ambiente Nº 17.283 del 23 de noviembre de 2000, el Ministerio de Vivienda, Ordenamiento, Territorial y Medio Ambiente (MVOTMA) es la autoridad nacional competente para la instrumentación y aplicación de la CMNUCC y del Protocolo de Kioto, debiendo establecer las medidas de mitigación y de adaptación al cambio climático, reglamentar las emisiones de gases de efecto invernadero (GEI) y coordinar los cometidos y funciones de otras entidades públicas y privadas que tengan relación con estas materias. Desde entonces la Unidad de Cambio Climático (UCC) de la Dirección Nacional de Medio Ambiente (DINAMA) tiene entre sus cometidos facilitar la aplicación de la Convención en el país. En este marco, la Unidad ha tenido además la responsabilidad de dar cumplimiento a lo previsto por los artículos 4.1 y 12 de la Convención para países no incluidos en el Anexo I de la misma, habiendo presentado las comunicaciones nacionales solicitadas, y por otro lado realizar las gestiones y arreglos necesarios para lograr la continuidad de este proceso. Para ello ha contado con la asistencia del Fondo para el Medio Ambiente Mundial (FMAM) a través de tres proyectos de Fortalecimiento Institucional ejecutados por el MVOTMA, siendo el Programa de las Naciones Unidas para el Desarrollo (PNUD) la agencia de implementación.

En mayo de 2009, Uruguay creó por Decreto el Sistema Nacional de Respuesta al Cambio Climático y Variabilidad (SNRCC) como un nuevo ámbito de coordinación horizontal de acciones públicas y privadas para la prevención de riesgos, la mitigación y la adaptación al cambio climático a cargo del MVOTMA. En este marco se conformó una Comisión Asesora *ad hoc*, integrada por técnicos de diferentes sectores, que entre otros cometidos elaboró el Plan Nacional de Respuesta al Cambio Climático (PNRCC)⁶ publicado en febrero de 2010 como un instrumento para incorporar el cambio climático a la estrategia de desarrollo sustentable del Uruguay a largo plazo. Este Plan define objetivos, principios rectores, estado de situación y líneas de acción estratégicas para enfrentar el tema del cambio climático.

Este marco institucional, ha contribuido a que Uruguay lleve adelante un proceso de desarrollo de las Comunicaciones Nacionales y su presentación a las respectivas Conferencias de las Partes:

El Proceso de las Comunicaciones Nacionales y principales cambios

La *Comunicación Nacional Inicial* recoge los avances y las medidas impulsadas en el país hasta 1997 para abordar aspectos de adaptación y mitigación, incorporando la información generada por proyectos específicos y estudios país. Para su elaboración se siguieron las Directrices adoptadas por la Conferencia de las Partes en su Segunda Sesión, por la Decisión 10 CP/2. Este documento incluye el Inventario de Gases de Efecto Invernadero (INGEI) de 1990 para el cual se utilizaron las Directrices IPCC/OCDE/AIE tanto para la elaboración de tablas como para la expresión de los resultados. Fue elaborada en el marco del Proyecto URU/95/G31, publicada en octubre de 1997 y presentada a la Tercera Conferencia de las Partes en Tokio, Japón en diciembre de 1997.

La *Segunda Comunicación Nacional* posicionó a Uruguay como el primer país en desarrollo en presentar su Comunicación siguiendo las Directrices aprobadas en 2002 por la Conferencia de las Partes en su 8ª

⁶ www.cambioclimatico.gub.uy, www.mvotma.gub.uy

Sesión (Decisión 17/CP.8). En base a ello se presentó información sobre circunstancias nacionales, inventario nacional de gases de efecto invernadero, medidas adoptadas o previstas por el país para aplicar la Convención, otra información relevante así como obstáculos, vacíos y necesidades conexas de financiación, tecnología y capacidades. El documento contiene información relativa al INGEI 2000 y una comparación de los resultados de los INGEIs para los años 1990, 1994 y 1998. Recoge además las medidas adoptadas por el país hasta el año 2004 en lo que respecta a mitigación y adaptación. Durante el proceso de elaboración se organizaron diversas instancias participativas y de consulta a diferentes actores involucrados. En particular, se destaca la elaboración del Programa de Medidas Generales de Mitigación y Adaptación al Cambio Climático (PMEGEMA), considerado uno de los contenidos fundamentales de esta Comunicación. Se realizó siguiendo una metodología participativa que consideró la convocatoria a sectores gubernamentales, no gubernamentales, privados y académicos y convocó a Grupos de Trabajo Sectoriales (GTS) interinstitucionales e interdisciplinarios donde se recogieron aportes y se buscaron consensos en la definición, selección y evaluación de las principales medidas de mitigación y adaptación sectoriales e intersectoriales para el país. Como resultado, se logró un documento de buena calidad y con aceptación y entendimiento por parte de todos los involucrados. Esta comunicación recoge además los resultados de la realización por parte del MVOTMA de una autoevaluación de la capacidad nacional para atender en forma integrada los compromisos emergentes de las Convenciones de Cambio Climático, Biodiversidad y Desertificación e identificar las oportunidades de realizar acciones sinérgicas en la implementación de las mismas. Se realizó en el marco del proyecto URU/00/G31, fue publicada en mayo de 2004 y presentada en Bonn, Alemania en ocasión de la 20ª Reunión de los Órganos Subsidiarios de la CMNUCC en junio de 2004.

La *Tercera Comunicación Nacional* recoge información del período 2004 al 2010. Deja a la vista los importantes avances logrados a nivel nacional en este período tanto en lo institucional como en la generación de conocimientos sobre los impactos de la variabilidad y el cambio climático y en la integración del tema en la comunidad y en los diferentes sectores de la actividad nacional. Este proceso de integración del cambio climático tuvo su punto de inflexión en la creación del Sistema Nacional de Respuesta al Cambio Climático y la elaboración del Plan Nacional de Respuesta al Cambio Climático.

Asimismo la TCN incluye el INGEI 2004 y un estudio comparativo de las emisiones netas nacionales de GEI para los años 1990, 1994, 1998, 2000, 2002 y 2004. Para su elaboración se utilizó la metodología del IPCC (versión revisada en 1996), así como la Orientación del IPCC sobre las buenas prácticas y la gestión de la incertidumbre en los INGEI (2000) y la Orientación del IPCC sobre las buenas prácticas en el Uso de la Tierra, Cambios en el Uso de la Tierra y Silvicultura (2003) a fin de otorgar mayor transparencia, coherencia, comparación, exhaustividad y exactitud a los Inventarios de Uruguay.

En esta Comunicación se presenta una síntesis de los escenarios climáticos y económicos definidos para Uruguay en los próximos años como herramienta para evaluar los efectos del cambio climático, la vulnerabilidad, la adaptación y las incertidumbres. Se incorpora además el análisis de vulnerabilidad para los diferentes sectores de acuerdo a los criterios de agrupamiento definidos en el Plan Nacional de Respuesta al Cambio Climático (PNRCC). Respecto a las medidas, recoge las acciones que Uruguay ha desarrollado en materia de adaptación y mitigación dentro del período, los estudios de vulnerabilidad e impactos y las líneas de investigación, educación y observación sistemática específicas al tema. Incluye además los avances en la integración del cambio climático en las políticas sociales, económicas y ambientales del país. En particular, se destaca la progresiva incorporación de la temática en los diferentes sectores analizados como salud, gestión integral del riesgo, agropecuaria, ecosistemas y biodiversidad, recursos hídricos y costeros, producción y consumo, turismo y energía. Fue realizada en el marco del proyecto URU/05/G32 de acuerdo a las Directrices aprobadas por la Conferencia de las Partes en su Octava Sesión (COP 8), en la Dec. 17/CP.8, publicada y presentada ante la 16ª Conferencia de las Partes, en Cancún México en noviembre de 2010.

El proceso de la *Cuarta Comunicación Nacional* ya está encaminado y tiene diferencias significativas con la comunicación anterior. Se ha definido como una de las principales líneas acompañar las negociaciones internacionales tratando de implementar las últimas decisiones y recomendaciones de la Conferencia de

las Partes en la CMNUCC (COP 16) celebrada en Cancún (México) en noviembre de 2010, así como las decisiones complementarias adoptadas en las COP's inmediatamente posteriores. En virtud del nuevo contexto internacional la Cuarta Comunicación Nacional de Uruguay se propone contribuir a la preparación del país para abordar los nuevos compromisos que surgen de los acuerdos de Cancún, en temas tales como MRV, NAMAs, periodicidad de reportes, sistema de inventarios, entre otros, y con una proyección hacia los próximos sucesos de la Conferencia de las Partes posteriores.

En otro orden se considera que Uruguay ha avanzado al crear un Sistema Nacional de Respuesta al Cambio Climático y al elaborar un Plan Nacional de Respuesta al CC y V, y por lo tanto cada sector y sus respectivas instituciones (ministerios, universidad, etc) han comenzado a asumir el compromiso de generar información sectorial, incorporar el tema en sus políticas sectoriales y apoyar el desarrollo de medidas de mitigación o adaptación que les competa. Por esta razón, en esta comunicación se considera que los esfuerzos a nivel nacional estén dirigidos a un rol más estratégico donde se genere información que aporte a las políticas sectoriales y nacionales. Como ejemplo, cabe citar dos estudios que se han planteado: por un lado, el análisis económico de medidas de adaptación sectoriales, y por otro, el análisis y desarrollo de indicadores utilizados para evaluar la implementación de prácticas de adaptación. Se ejecuta en el marco del Proyecto URU/11/G31.

Principales lecciones del Proceso de las Comunicaciones Nacionales y principales cambios

1. *Lograr la continuidad de un proceso.* Se reconoce la importancia de lograr la continuidad del proceso ya que esto ha dado la posibilidad de incorporar el tema del cambio climático en negociaciones internacionales y asistir al país. La Decisión 8/CP 11 hace mención al criterio de *proceso* de las comunicaciones nacionales:

“La Conferencia de las Partes.....Consciente de que la preparación de las comunicaciones nacionales es **un proceso continuo**,....

1. Invita a las Partes no incluidas en el anexo I de la Convención que no hayan preparado aún las propuestas de proyecto para la financiación de las comunicaciones nacionales segunda y, en su caso, tercera, a que lo hagan, incluso antes de haber finalizado en gran parte sus comunicaciones nacionales precedentes a fin de **evitar la discontinuidad en la financiación de los proyectos ...”**

Atento a esta Decisión y a la experiencia de Uruguay, el Gobierno Uruguayo ha considerado prioritario continuar con las Comunicaciones Nacionales como política de estado. Para llevarla adelante, el Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente a través de la Unidad de Cambio Climático de la Dirección Nacional de Medio Ambiente ha desempeñado una función de liderazgo y coordinación para la realización de acciones para la aplicación de la Convención, su comunicación formal a la comunidad internacional, para la incorporación de la temática en las actividades nacionales en curso y para la obtención de resultados a ser informados en las Comunicaciones Nacionales. En todo este proceso, se ha contado con el aporte del Programa de Apoyo a las Comunicaciones Nacionales (NCSP) del Programa de Naciones Unidas para el Desarrollo (PNUD). Como ejemplo, puede citarse la participación permanente de los técnicos de la Unidad de Cambio Climático en diferentes instancias de sensibilización y capacitación que surgen en el país para variados destinatarios y que permiten difundir información de alcance internacional y nacional sobre cambio climático. En los últimos años, se ha participado en actividades de sensibilización y actualización a tomadores de decisión sobre el avance de las negociaciones, cursos de formación posgrado en gestión ambiental, charlas para escolares y actores locales y actividades para docentes en formación en el proyecto “Conversando de Ciencia del Ministerio de Educación y Cultura y, Esto ha contribuido por ejemplo a la incorporación formal de la temática del cambio climático en la currícula de la Enseñanza Secundaria.

2. *Contribución al fortalecimiento del país para enfrentar los impactos del cambio climático, en políticas públicas, en la integración de diferentes sectores y en la posición internacional.*

El proceso de elaboración de las tres Comunicaciones Nacionales presentadas por Uruguay a la

Conferencia de las Partes en la CMNUCC, ha contribuido al fortalecimiento de la capacidad hacia el interior del MVOTMA como institución competente para la aplicación de la Convención. Debido a la estrategia que se ha seguido fundamentalmente en la elaboración de la Segunda Comunicación Nacional y Tercera Comunicación Nacional, y además en el contexto nacional de creación del Sistema Nacional de Respuesta al Cambio Climático y la Variabilidad se ha logrado incrementar el conocimiento, la preocupación y la conciencia sobre el cambio climático de diferentes actores de la actividad nacional, provenientes de los sectores gubernamental, no gubernamental, privado y académico. En este proceso, hemos pasado de estudios sectoriales como en la Comunicación Nacional Inicial sobre mitigación para el rubro de caleras, a un Programa de carácter nacional con Medias de Mitigación y Adaptación (PMEGEMA) en la Segunda Comunicación, hasta llegar a la institucionalización del SNRCC y el apoyo a la implementación del PNRCC en la Tercera Comunicación.

Los *estudios* realizados en el marco de las Comunicaciones han contribuido a generar información específica. Ejemplo de ello son dos estudios realizados en la Tercera Comunicación Nacional: la determinación del impacto de escenarios futuros de cambio climático sobre la producción agropecuaria (pasturas naturales y cultivo de arroz); y la evaluación de la vulnerabilidad costera uruguaya frente a posibles escenarios de cambio climático y evaluación económica de las medidas de adaptación. Actualmente, en el marco de la Cuarta Comunicación se contribuye al conocimiento y desarrollo de indicadores para evaluar prácticas de adaptación; en particular, se seleccionó el Índice de Utilidad de Prácticas de Adaptación (IUPA) para implementar en sectores como agro, salud, recursos hídricos, costas y biodiversidad.

En cuanto a capacitación, en el marco de las Comunicaciones se ha logrado capacitar e incorporar recursos humanos en áreas específicas que han sido definidas como prioritarias para avanzar en los informes a la comunidad internacional. En tal sentido, cabe mencionar la capacitación de técnicos en materia de inventarios, en MDL, en NAMAs y en herramientas para desarrollar indicadores y estrategias de adaptación. Estas instancias han sido convocadas por la Secretaría de la CMNUCC y el CGE, así como por otras redes técnicas internacionales (Red MAIN, Euroclima, RIOCC). Con los recursos humanos fortalecidos se ha logrado además tomar conocimiento de las experiencias de los otros países tanto en adaptación como en mitigación, y capitalizarlas en el diseño de las estrategias nacionales.

3. Contribución al fortalecimiento del país en la posición internacional sobre cambio climático y en la asistencia a otros países.

Se han fortalecido las capacidades para dar seguimiento a las negociaciones internacionales, y dotar a las delegaciones nacionales de mayor conocimiento sobre los avances en las mismas. De la misma forma, a nivel internacional se han fortalecido otros países en desarrollo a través del aporte de Uruguay como miembro del CGE.

Estas instancias han representado una oportunidad para llevar adelante las últimas decisiones adoptadas en el marco de la convención como las NAMAS (hacia el diseño de NAMAS sectoriales), el desarrollo bajo en carbono y mecanismos de transferencia de tecnologías.

En el marco de la cooperación internacional este proceso ha contribuido a apoyar a las otras Convenciones, a implementar los MDL y proyectos sectoriales como los de eficiencia energética, agro y adaptación o NAMAS, e indirectamente a lograr el fortalecimiento de las Unidades de cambio climático.

Por otra parte, la identificación de las prioridades nacionales en mitigación y adaptación y su comunicación a la Convención en las Comunicaciones Nacionales contribuyen a identificar las necesidades de financiamiento del país y a visualizar estas prioridades ante oportunidades de apoyo por parte de organismos multilaterales de financiamiento. Como ejemplo, en el marco de las comunicaciones se han gestionado proyectos de mitigación y adaptación como el de Recuperación y

aprovechamiento energético del metano del relleno sanitario de Las Rosas- Maldonado; el Proyecto de Eficiencia Energética; el Programa Eólico, el Proyecto de Producción de electricidad a partir de biomasa (PROBIO) y el de implementación de medidas piloto de adaptación al cambio climático en zonas costeras.

Conclusiones

El proceso de las Comunicaciones Nacionales en Uruguay ha contribuido significativamente a incorporar la temática del cambio climático en nuestro país, dando lugar a nuevos conocimientos, recursos humanos con mayor formación en áreas específicas, apoyando nuevos marcos institucionales y difundiendo la temática en la comunidad.

Por otra parte este proceso contribuye a dar seguimiento a las negociaciones internacionales y a preparar al país para abordar los nuevos compromisos. En este marco, resulta de gran Importancia dar continuidad al trabajo de las Unidades Nacionales de Cambio Climático y para ello es importante lograr la continuidad del Programa de Apoyo a las Comunicaciones Nacionales del PNUD o de otro programa similar, con el apoyo del GEF u otro mecanismo financiero multilateral que cumpla funciones similares. Esto contribuirá a apoyar los procesos de los países en desarrollo hacia la formulación de las futuras estrategias en el marco de las negociaciones y los nuevos compromisos al 2020. Esto permitirá a los países en desarrollo continuar cumpliendo con sus obligaciones frente a la Convención como son las Comunicaciones Nacionales y otros compromisos similares como los BUR en un futuro cercano.

Capacity building is considered the stepping stone for all activities of the National Communications. In Georgia NCs practically coordinate the ongoing climate change activities by offering them new methodologies, models, vision of political processes in negotiations, and future perspectives.

Many issues affect the outcomes of NC, from Institutional Arrangements to the building of capacity of the NC teams and all the stake holders. The Saint Lucia experience shows that addressing and integrating climate change effectively, throughout the various sectors of development, is one of the keys to success.

The country identified a few important issues for success based on the institutional arrangement that could facilitate implementation and also allow for varying levels of support that strengthen the national capacities.

The following countries are depicted in this chapter:

1. **Liberia**: Main Lessons Learnt
2. National Capacity Built in **Georgia** through National Communications Preparation Process
3. THE SECOND NATIONAL COMMUNICATION JOURNEY- The **Saint Lucian** Experience
4. Using national communications process as a tool to build national capacities on climate change –experience from **Serbia**
5. **Sri Lanka** Constraints related to Data Issues: Data Availability and Accessibility
6. **Suriname**'s experience in developing national communications to the UNFCCC

Liberia

Main Lessons Learnt from the Initial National Communication

By: Ben Karmorh

Liberia became Party to the United Nations Framework Convention on Climate Change in 2002. In fulfilment of its obligations under this international instrument, Liberia started the preparation of strategic documents, including the National Adaptation Program of Action (NAPA) which started in 2004 and was completed in 2008. Furthermore, Liberia began the development of its Initial National Communications (INC) in 2005 which has been validated early 2012. The Initial National Communications project management comprised of the National Project Coordinator, Administrative Assistant and the project Accountant.

The main lessons learnt from the National Communication process cannot be overemphasized. The National Communication provided the opportunity for Liberia to raise awareness about the impacts of climate change, strengthen national institutions and human resources by building the capacity in the areas of greenhouse gas (GHG) inventory, vulnerability and adaptation assessment, mitigation analysis, models, public awareness, research and education. In addition, the National Communication process enabled the country for the first time to compile GHG data. The project also specified a list of nationally appropriate mitigation activities. The mitigation options/activities identified in the Initial National Communication coupled with other national and sectoral policies, development plans and programmes provide a basis for the development of Nationally Appropriate Mitigation Actions (NAMAs), many of these options are leading to strategies that if implemented with the right political commitment could accelerate Liberia drive to a low carbon development. Besides, the project provided immense opportunity for the Environmental Protection Agency, the Designated Inventory Agency to establish adequate linkages with relevant institutions and other stakeholders in climate change related activities in Liberia.

The development of Liberia's Initial National Communications has not been easy and has met with a lot of challenges. A lot of data and information gaps exist that make the document comparatively incomplete. For climate change vulnerability and adaptation assessment, it was required that Liberia developed its climate change scenarios. Due to civic unrest, updated long term observational data were missing for the development of the climate change scenarios. As a result, simulations were based on an ensemble of Regional Climate Models (RCM).

The following challenges, constraints, gaps and capacity deficiencies were evident:

- Current policies, strategies and regulatory mechanisms have limited or no consideration of climate change issues;
- Absence of a dedicated Technical Committee or Task Force that should be implementing the climate change convention and it's Kyoto Protocol.
- Limited expertise at the national level in the assessment of mitigation and adaptation options, participation in the Kyoto Protocol process and development of appropriate implementation strategies. The major constraint lies in the absence of expertise in adequately and appropriately analysing, developing and costing of both mitigation and adaptation options and projects;
- Development of national and/or regional specific emission factors with the ultimate objective of improving and updating the National Greenhouse Gas Inventory by reducing uncertainties in the statistics;
- Limited institutional framework and technical expertise for the development of a comprehensive and integrated vulnerability (impacts and adaptation) assessment;
- Sustained access to a reliable body of scientific and technical information.

As regards the integration of climate change into national development planning, the findings of the

Initial National Communication prompted the National Legislature of the Republic of Liberia to ensure that budgetary allotment was made for addressing the impacts of climate change along the coast areas of the country.

In conclusion, to strengthen the overall national communication process, it is important to note that adequate human and institutional capacity is a necessary condition for the implementation of the UNFCCC. From the process of development of this First National Communication of Liberia it is concluded that capacities at the systemic, institutional and individual levels are deficient. To improve and enhance the implementation of the climate change convention in Liberia capacity building at all these levels is required and should be a high priority. At the systemic level, policies, strategies, plans and programmes should be revisited and aligned with emerging issues particularly in the environment and climate change spheres. Institutional frameworks should be strengthened and made relevant to address the ever present risks posed by environment and climate change on social and economic development. The skills and capacities of individuals that are tasked by public and private sector institutions to participate in the implementation of climate change in the country should be built and enhanced

Georgia

Capacity Building through National Communications Preparation Process

By: Marina Shvangiradze

History of national communications preparation process in Georgia and main barriers identified

Georgia ratified the UNFCCC on 29 July 1994 and Kyoto Protocol to the Convention on 16 June 1999. In May 1997 the Country started the preparation of its Initial National Communication (INC). At that point not enough time had passed since the Rio Summit on Sustainable Development and signing of three Rio Conventions. At this time the understanding of sustainability of different processes and its linkages to the proper management of natural resources-including climate change related phenomena was quite low. The awareness of the possible negative/positive impacts on the sustainability of ecosystems and economic sectors-was also low among scientists, decision makers and public, not to mention the private sector that was in a very early stage of development in all transition countries including Georgia.

After the dismantling of the Soviet Empire in 1992 post-soviet countries were flooded by social, economic and political problems and the significance of climate change vulnerability as well as other environmental problems was irrelevant among the existing challenges. Despite the lack of expertise, and full recognition of the risks related to this problem and complex circumstances for the implementation of environmental projects at the initial stages, Georgia started quite actively involving in the climate change international process and has been developing national capacities since the ratification of Convention. The principal approach followed during the implementation of the INC and subsequent communications has been to make the process broad and nationwide, and at the same time has tried to increase the national capacities as much as possible.

In 2012 Georgia started preparation of the Third National Communication (TNC). The stocktaking exercises have demonstrated that general awareness with regards to global warming and climate change is relatively high among decision makers, the private sector and scientists. However, the country still faces a lack of multidisciplinary expertise and experience, availability of data and research studies on vulnerability, gaps in knowledge of technologies and trained staff for operation of new technologies. These are still pending issues.

As a result of analysis of NCs and other climate change related implementation processes, we concluded that the main barriers are the following:

- Limited availability of local expertise in multidisciplinary areas faced almost all sectors within the NCs. This barrier is a result of a transitional period. Experts working in different sectors like agriculture, water resources, forest management, soil degradation, and extreme geological

events have high qualification and long-term experience in their respective fields. However, they are limited in their ability to keep up with changing knowledge because of language and internet restrictions. On the other hand the younger generation does not have these barriers, but they do have a lack of relevant knowledge and experience. Second and third national communications tried to remove this barrier by combining these two and giving them an opportunity to exchange knowledge, skills and experience. In parallel, within the NCs preparation process, students got on job training in their respective subjects. Recently, the specialties related to listed sectors are not popular among the younger generation and therefore only on-job training could be effective.

- Local capacities to work with the contemporary tools for forecasting the future trends (of climate scenarios, GHGs and impact of climate change). NCs preparation staff having access to the contemporary tools and methodologies and having trainings provided by the different supporting capacity building programmes and institutions has been introduced and implemented these contemporary tools and methodologies in the country. Among them are models like: PRECIS (CC scenarios), MAGICC/SCENGEN (CC scenarios), LEAP (Energy planning), WEAP (Watershed planning and management), CropWat (water deficit in agriculture), Aquacrop (water deficit and productivity in agriculture), CO2FIX (Forest sector). Some new methodologies and approaches (assessment of Heat Index, assessment of Heat Waves frequency through Fuzzy Numbers Theory) are developed by the local experts and students themselves. . All these tools as well as trained experts are currently used by other implementers of CC related projects.
- Lack of understanding of sustainable development process and lack of coordination of processes and projects at national and international donors' levels. This is more manifest when developing sectoral strategies and concepts, and constitutes an impediment to mainstreaming climate change issues and specific findings of the NCs and other CC related projects. Practically, the mainstreaming process has been unsuccessful for the SNC process. The role of UNDP and other donor organizations could be crucial in the mainstreaming process. The UNDP office in Georgia is coordinating and supporting the TNC process in order to fulfill this most important objective of the NCs, climate change mainstreaming
Through permanent coordination meetings and hearing of projects implemented by the UNDP it is foreseen that CC issues will be relevantly dealt by all sustainable development projects. In addition, UNDP gives opportunity to the NC staff to participate on the coordination meetings conducted out of UNDP.
- Poor statistics from the perspective of GHGs inventory and limited access to existing data along with the lack/absence of climate change studies in different sectors is a significant barrier in developing a CC strategy or action plan. During last three-four years the country has received a significant amount of grants for conducting research studies demonstrating CC impact on different ecosystems. Unfortunately, international support in assessment of CC impact on economy sectors (agriculture, tourism, renewable energy including hydro) is still insignificant. NC management invites all potential stakeholders to the PSC (Project Steering Committee), at the workshops and collects all existing information contributing to the increase and improvement of national and local statistics. The CoM (Covenant of Mayors initiated by the EU) process and preparation of SEAP (Sustainable Energy Action Plan) for CoM signatory cities is one of the best examples of disaggregation and improvement of statistics for GHGs inventory and future projection.

Climate change related activities and projects ongoing in Georgia other than NCs

There are several projects initiated in Georgia regarding climate change and TNC is involved by consulting, coordinating, and generating new project proposals. The Initial and Second National Communication, Technology Needs Assessment (TNA) phase I and II have been followed by a series of specific studies and projects in the climate change focal area. These climate change activities have been supported by UNDP and other development agencies, such as GiZ (German International Technical

Cooperation), EU, USAID, ENVSEC (Environment and Security Initiative), as well as bi-lateral assistance from countries, for example the Czech Republic has contributed to demonstration projects on climate change issues. In addition, over the time since the Second National Communication, there has been an increase in investments towards climate change efforts for local municipalities, such as the City of Tbilisi and the municipalities of Batumi and Kutaisi.

The UNDP agency in Georgia has contributed considerably to the climate change efforts in the country. Most of the projects implemented by the Energy and Environment and Economic Development portfolios of UNDP Georgia are related to climate change. These projects range from Renewable Energy to Risk reduction and green business opportunities.

Other projects linked to capacity building are being implemented under financial and technical support from USAID e.g.: “Strengthening Local Capacity and Developing Structured Dialogue for Climate Change Adaptation, Natural Disaster Risk Reduction and Post-Conflict Rehabilitation in Georgia” (implementing by CENN, 2009-2012). Some other projects in Natural resource management, energy modelling, energy efficiency, biodiversity and forest protection are also being implemented in USAID’s pipeline.

Projects developed in support of the implementation of the UNFCCC and the Kyoto Protocol financed by the EU Commission and implemented by the REC (Regional Environmental Center) and the Ministry of Environment include public awareness activities such as the “climate week” organized every year since 2009, as well energy projects such as “Energy Saving initiative in the Building sector in the Eastern European, Caucasus and Central Asian Countries”, “Support to Kyoto Protocol Implementation”, “Identification and implementation of adaptation response to Climate Change Impact for Conservation and Sustainable use of agro-biodiversity in arid and semiarid ecosystems of South Caucasus”, “Increasing the resilience of forest ecosystems against climate change in the South Caucasus countries through forest transformation”, and others.

Main achievements of the Second National Communication of Georgia in the capacity building process

There are several different scopes of activities performed within the SNC which have significantly contributed to the development of national and regional level capacities.

- One of the important achievements is **decentralization of the NC preparation process** and application of an ecosystem and regional approach. The SNC didn’t cover the whole territory of Georgia, but instead two regions in particular have been studied more in-depth. Regions and ecosystems for consideration within the SNC have been assessed preliminarily, during stocktaking exercises as the most vulnerable to climate change. Deeper assessment of problems and development of specific project proposals established (facilitated) the groundwork for other climate change related projects that target these most vulnerable regions and ecosystems and practically implement projects.
- **Improvement of national statistics and facilitating the establishment of regional statistics** is also a significant contribution of the NC process to the establishment of local capacities. If national statistics are oriented along parameters contributing to the economy’s development, the NC process collects parameters related to sustainable development process in general and in particular, to the local adaptive capacities, sensitivities and climate change impact. Statistics gathered within the NCs are broadly used by other projects.
- Special attention should be given in this process to the **assessment of current climate change trends, and development of future scenarios**. Within the SNC it was not possible to assess future scenarios for whole territory but it has been done only for targeted regions and targeted scopes. The methodology for future scenarios assessment has been implemented within the SNC and a model run has been conducted for the establishment of a database. Because of the size and variety of climatic parameters, the future trends assessment is being done on a case by case basis, with changes being dependent on scope (agriculture, extreme geological events, water resources, health, etc) and location. Other ongoing projects are using the same model run and methodologies for other sites and other sectors.

- **Introduction and implementation of new models and methodologies** is the most significant achievement of the NC preparation process. Other models calibrated and validated within the SNC are LEAP for planning of energy sector, WEAP for watershed management, Crop Wat for assessment of water deficit in agriculture sector, CO2FIX for assessment of CO₂ absorption by forest plantations, Heat Index (HI) calculation programme along with the new methodology based on fuzzy sets theory developed within the SNC for assessment of trends.
- **Preparation of the set of project proposals** could be considered among the most successful initiatives identified by various stakeholders interviewed. One of the successful examples is the measures initiated in the Dedoplistskaro region where GiZ, in cooperation with the ministry of Environment Protection and local self-governance have participated in reducing desertification risks through climate change adaptation and improving the quality of degraded lands to renew socio-economic value in this region (38 ha of wind-breakers are rehabilitated, more than 100 ha of eroded former pasture lands are planted with different tree species).
- **Increasing the local expertise.** During the SNC, about 10 experts and students were trained in the different regional downscaling models listed above that were used in SNC. The application and use of these models for the projection of the impacts of climate change on the systemic level has strengthened the individual and institutional capacities in conducting investigations on climate change.

The main result of capacity building process achieved in national communication preparation process is that statistics gathered, results of assessments, methodologies and models calibrated and validated for the country or regions or particular sites and experts trained on-job are broadly used by other stakeholders including local governments and non-governmental sector when developing or implementing climate change related projects:

- One of the best example of such cooperation and capacity building is the SEAP prepared by the Municipality of Tbilisi city as a part of its voluntary commitment to reduce the GHGs emissions from the territory of the city by 20% for 2020 taken within the Covenant of Mayor process initiated by the EU for the EU cities and extended later for east cities as well including non-Annex I Parties. The LEAP model used first within the SNC has been applied for future (by 2020) emission forecasts and the establishment of reference scenarios for Tbilisi city. Other cities in Georgia who have signed the CoM intend to apply the same methodology in SEAPs preparation.
- There are several big projects ongoing in Georgia, mainly targeting agriculture, biodiversity in semi-arid areas and water resources sectors. These projects are being implemented by different stakeholders and among them non-governmental sector such as CENN (Caucasus Environmental NGO Network) and REC Caucasus (Regional Environmental Center of Caucasus) in close cooperation and coordination with the Third National Communication (TNC) preparation process. These projects are applying the same climate change current trends and future scenarios as the one prepared by the second and third NCs, including the same models and methodologies offered by NCs and even similar experts. From their side these ongoing projects significantly contribute to the NC preparation process with new information and findings and sometimes with new methodologies as well. E.g. the multi-criteria analysis used first in Technology Needs Assessment (TNA) project for the prioritization of adaptation and mitigation technologies was later used in REC Caucasus project “Identification and Implementation of Adaption Response to Climate Change Impact for Conservation and Sustainable Use of Agro biodiversity in Arid and Semi-arid Ecosystems of South Caucasus” for prioritization by climate change vulnerability of semi-arid regions of Georgia. This experience will be transferred to the TNC for assessment of climate change vulnerability of agriculture and public health sectors of municipalities in Ajara region which is the target region in the first year of TNC implementation.

Practically, it could be said that NCs coordinate the ongoing climate change activities by offering them new methodologies, models, visions of political processes in negotiations, and future perspectives.

However, the above does not mean that there is no problem with coordination and cooperation among implemented projects. Competition and lack of coordination are not only among ongoing projects and new projects, but in the donor society itself, having impacted national processes as well. The hope is that the cooperation process can be intensified.

Capacity building activities planned within the Third National Communication

The above mentioned are significant achievements, but not enough for climate change exposure risk eradication, and therefore the focus of the TNC team is still on increasing local capacities at the national and regional levels by bringing into the country updated knowledge about the latest challenges, new methodologies for vulnerability assessment, adaptation and mitigation planning, facilitating the local and international stakeholder involvement in adaptation and mitigation technologies needs assessment.

New models and methodologies are to be implemented within the TNC preparation process. Among them are: statistical downscaling models for assessment of future climate change scenarios, RCLIMDEX for assessment of extreme weather trends, AquaCrop model which is a modification of CropWat model used in the SNC but with facilities to link the water deficit to the productivity, calculation of tourism climate index, etc. On-job training of students in contemporary models application, on-job training of local (in regions and municipalities) experts in identification and preparation of project proposals is continuous practice of NC implementation process in Georgia.

Support provided by the UNFCCC Secretariat and NCSP

The UNFCCC Secretariat and its web page have a very important role in the capacity building process, providing countries not only with the latest updates and sources of information but with technical tools (software models) for improvement of the national level assessment process. Most of the models applied by Georgia in its SNC have been chosen according to or based on the information provided on the site. Along with improved access to contemporary technical tools, the set of training workshops that were organized by the Secretariat assisted the countries in operating these tools. More training workshops with increased participation of technical experts from the NCs teams would really improve the technical capacity of these teams. Among the trainings provided by the secretariat the GHGs inventory training programme should be specifically mentioned. It significantly increased the national capacity in this sub sector. Access to such training programmes should be broadened by the Secretariat and open for different research institutions and university students. A broadening of the training process would contribute to the national capacity building process.

The support provided by the NCSP in the national capacity strengthening process deserves to be highlighted. Several initiatives have been implemented at the regional and country levels since the establishment of this unit/programme. The level of participation of non-Annex I Parties from different regions in the program's activities varies from region to region and from country to country. From the perspective of Georgia it would be worthy to highlight three programs provided in support to national capacity building:

- Regional project (for 12 post socialist countries) on the improvement of the national capacities in preparation of the GHGs inventory. The improvement of the AD archiving process and of the national EF development tools, assessment of uncertainties in GHG inventory and implementation of QA/QC procedures are only sub-sets, but are also the most important elements established in Georgia's SNC preparation process. QA/QC procedures have been effectively applied for all sectors considered in the SNC.
- Training sessions in application of climate change regional models and other tools such as PRECIS (together with the Hadley Center, UK) and MAGICC/SCENGEN. Climate change scenarios developed within the SNC of Georgia, methodologies provided within these training courses and experts trained by the NCSP within the SNC are being broadly utilized by all other ongoing climate change related projects.
- Training provided in the application of LEAP models was successfully implemented in the country

for GHGs emission trends assessment and the development of climate change mitigation strategy for energy and transport sectors. This tool was successfully applied in development of GHGs reference scenario for preparation of Tbilisi city Sustainable Energy Action Plan required for Covenant of Mayors signatory cities. Experts trained in LEAP are successfully involved in the development of MARKAL model for energy sector planning and application of WEAP model for river catchments management planning.

- The role of NCSP should be increased in non-Annex I national communication preparation and improvement processes. Georgia has already used the opportunity provided by the programme to review Georgia's GHGs national inventory. Recommendations provided by the expert are being implemented in the TNC. Such type of support seems more attractive for countries after the decision on biannual GHGs inventory from non-Annex I Parties made in Durban. Georgia is also vitally interested in obtaining a review of the Third and consequent National Communications documents with regards to quality improvement and increased usefulness of this document for internal use by the Government in the decision making process. The country has a particular interest in supporting and increasing the national expertise in modern tools for assessment of vulnerability and in technologies for adaptation and mitigation.

Saint Lucia

The Second National Communication Journey- The Saint Lucian Experience

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Background: Synopsis of overall experience

Saint Lucia ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1993 and in 2001 completed and submitted its Initial National Communication (INC) to the UNFCCC. Following the submission of its INC, the National Climate Change Policy and Adaptation Plan was adopted by the Cabinet of Ministers in 2002. This set the basis for furthering climate change mainstreaming in the various sectors and into the overall national development planning process.

In launching the Second National Communication (SNC) process in September of 2006, participants highlighted the need to *inter alia* look more intently at the nexus between disaster and climate change, as well as the critical role of the energy sector in responding to the effects of climate change.⁷ The SNC process therefore sought to build on the work conducted under the INC and to deepen the mainstreaming of climate change considerations into national development planning. This process would embrace, as integral pillars, multi-sectoral and multi-stakeholder input, including public-private partnership; integration of climate change consideration into policy processes; reliance on national experts and improving the capacity of national expertise in the process of developing the various components of the SNC. The institutional arrangements for the programme allowed for tiered support, despite political shifts which resulted in changes in the reconfiguration of ministries. The SNC program ended in April 2012, with formal submission to the UNFCCC Secretariat.

⁷ 2006, Report of Inception Meeting-Second National Communication, Ministry of Physical Development, Environment & Housing

Pillars for the success of SNC

The experience in Saint Lucia has shown that, to effectively address climate change, consideration for the phenomenon must be integrated throughout the various sectors of development. This calls for integrated planning for climate change and a clear recognition that climate change requires a multidisciplinary approach in responding to the anticipated impacts. The following were identified as the main pillars for the success for Saint Lucia's SNC.

Sectoral approach mirroring development planning process: In Saint Lucia, the development planning process is such that at the sectoral level, relevant agencies prepare policies and plans which reflect broad-based consultation. These are then submitted to the Ministry with responsibility for Finance and Economic Affairs, which has oversight over the strategic direction for the country. Once these projects, plans and policies are submitted to the Ministry of Finance, prioritization for implementation is made based on resources availability.

The implementation of the SNC patterned this approach by involving stakeholders from the various sectors, as well as building on the various sector studies which were conducted through the INC process. The SNC components selected, mirrored this pattern with the vulnerability and adaptation sectors namely financial services sector, critical infrastructure, agriculture, water resources, terrestrial and marine biodiversity, coastal and marine, tourism and human health reflecting priority sectors for Saint Lucia. The greenhouse gas inventory process focused on energy, transportation, agriculture, industrial process and manufacturing sectors. All of these sectors are crucial to Saint Lucia's development. In the case of energy, a significant amount of the country's foreign exchange earnings are spent on fossil fuels imports.

It must be underscored that all sectors impact each other, and that the impact of energy on all other sectors is particularly significant. The cross-cutting nature of these sectors which work together as individual strands of the chord of economic development on this small island economy necessitated that the SNC implementation process critically and comprehensively analyze points of convergence of the various sectors. This would therefore allow recommendations emanating from individual sectors to fit together to produce rigorous climate change impact assessments.

As a case in point, the Critical Infrastructure sector analysis for the Vulnerability and Adaptation Assessment (V&A) zoned in on the various aspects of critical infrastructure such as:

*“critical structures, vital infrastructure, public utilities, solid and hazardous waste storage, location of emergency services, storage of critical data, as well as storage of emergency supplies and fuel”.*⁸

The assessment of this sector and its recommendations would affect other sectors such as tourism and health for V&A and transport and energy sector for Mitigation and GHG analysis. In this way, the human (social), environmental and economic impacts of climate change could truly be assessed. The SNC provided a useful basis for further analysis of the impacts of climate change on Saint Lucia's sustainable development. Also of importance were; the disaster risk report, the GIS report and the climate chapter which provided meaningful information for all sectors. The water resources sector previously mentioned was selected particularly for its cross-cutting nature, to highlight the impact on all other sectors. The sector was analyzed both from a water resource and water service provision perspective in the context of climate change.

Climate change in development planning processes: The process of mainstreaming climate change in national development planning has been an enduring one with exemplary successes along the journey. The Climate Change Policy and Adaptation Plan has been the basis for various sector discussions on climate change, as is reported in the National Symposium on Climate Change and Food Production, as

⁸ 2010, Government of Saint Lucia, Vulnerability & Adaptation Study for Saint Lucia's National Communications-Critical Infrastructure

well as in the Climate Change and Health Sector workshop reports of 2006. Various programmes, like the Mainstreaming Adaptation to Climate Change (MACC), Caribbean Planning for Adaptation to Climate Change (CPACC), Adapting to Climate Change in the Caribbean (ACCC) and the Special Programme on Adaptation to Climate Change (SPACC), have deepened that integration process. They therefore provided a useful platform for the SNC programme to continue the mainstreaming process.

A number of sectoral policies now include climate change considerations, such as the Agriculture Sector Policy, as well as the Saint Lucia National Emergency Management Plan. Also significant was the use of GIS under the SNC program to develop downscaled scenarios (1:25,000) using the PRECIS model and a UNESCO study conducted in Saint Lucia in 1997, specifically for use as a planning tool for physical infrastructure to determine setbacks, the specificity for roads and for engineering purposes.

Institutional arrangements: The SNC did not exercise hierarchical discrimination in capacity building and information-dissemination. Cohen, in his work on microeconomic policy, in speaking to the 'bureaucratic bias', posits that governmental departments wield discretionary power to their benefit, as a result of an absence of competition within the public sector in their respective fields. This, according to Cohen, is usually at the expense of the various publics which the bureaucracies serve, by, for example, deliberately hoarding information for furthering of their own objectives⁹. Although it cannot be said that the design for the institutional arrangement was devoid of 'self-interest', the approach utilized certainly disseminated information to as many stakeholders as possible.

The institutional arrangement to facilitate implementation under the SNC allowed for varying levels of support. The components of this institutional arrangement included the appointment of a Project Coordinator and a Project Assistant, as prescribed by the National Climate Change Support Program. Their functions included ensuring that the programme was implemented in such a way so as to adequately manage emerging issues, as well as liaising with the various stakeholders on behalf of the Government of Saint Lucia. In addition, the broader climate change team of the Sustainable Development and Environment Division (SDED) provided support to assist in the preparation of documents, organization of meetings and all other backstopping necessary.

Further, the National Climate Change Committee (NCCC), a broad-based committee, which was re-established by the Cabinet of Ministers in 1999, has been tasked with overseeing and providing guidance on national climate change issues and activities. The role of this entity, as well as that of sector experts, will be expounded in subsequent paragraphs.

Multi-stakeholder approach: The multi-stakeholder approach adopted ensured integration and strengthening of the existing formal structure of the NCCC. The NCCC meets quarterly or as budgetary allocations allow and attendance by members is typically high. This means that the Committee members were able to regularly monitoring the progress of implementation of the SNC programme and provide general guidance to how emerging issues could be addressed. The role of the NCCC is critical as it can directly make recommendations to the Cabinet of Ministers and can establish sub-committees as appropriate.

The composition of the NCCC is as follows;

1. Sustainable Development & Environment Section)- Chair
2. Meteorological Services Department
3. Ministry of Finance
4. Ministry of Tourism
5. National Emergency Management Unit
6. Physical Planning Department
7. Public Health Department, Ministry of Health
8. Public Works Department
9. St. Lucia Electricity Services Limited

⁹ 2001, Cohen, S. J, Microeconomic Policy, Pg 149-150, Routledge

10. St. Lucia Solid Waste Management Authority
11. Sir Arthur Lewis Community College
12. Water Resources Management Unit
13. Water & Sewerage Company
14. Biodiversity Unit
15. Department of Agriculture
16. Department of Fisheries
17. Forestry Department
18. Insurance Council of St. Lucia
19. Saint Lucia Bankers Association
20. Saint Lucia National Trust.

The NCCC also, depending on the nature of the projects being implemented, invited various interest groups to form part of their deliberations such as community based organizations (which includes gender interest groups) and representatives of civil society. As such, public- private partnerships were utilized in the various components of the SNC. There were key components where those partnerships stood out particularly strongly. These included the mitigation analysis, the greenhouse gas inventory and the vulnerability and adaptation assessments.

National expertise and capacity building: The national experts who contributed to the implementation of the SNC programme formed part of both the public and private sectors, with experts from these two streams working jointly to achieve the SNC objectives. This proved to be an indispensable and critical buffer against many of the challenges encountered. These challenges included sourcing of data and building partnerships with agencies which facilitated better access to data as well as promoting ownership of the national communications process.

As a result of the approach adopted, a number of Saint Lucians, in the public and private sectors, developed their capacity with respect to addressing climate change. For example, under the Greenhouse Gas Inventory component, the team included the national electric utility, the governmental agencies responsible for energy planning and transportation as well as for public utilities. Across all components, sector experts such as economists, insurers, agriculturalists, public health experts and GIS experts, among others, were afforded the opportunity to apply and include climate change considerations in the approach to their work under the SNC process and within their respective agencies.

In addition to the sector experts who were hired as consultants under the various components of the SNC, a number of national bodies also benefited from the SNC process. These included the Association of Professional Engineers of Saint Lucia, the Saint Lucia Institute of Architects, the Credit Union League¹⁰, farmers and fisher-folk (including women), the Saint Lucia Hotel and Tourism Association and the Saint Lucia Chamber of Commerce. Not only were they engaged in consultations, but these agencies had an opportunity to make substantial input into the various reports which fed into the SNC. This therefore allowed for national capacity-building and awareness, which can facilitate and enhance future national communication processes.

Main Challenges

A number of challenges were identified during the implementation of the SNC. Key among these included political shifts, time constraints, data constraints, the sectoral nature of assessments and the need to secure Public Sector administration buy-in. A summation of these and other challenges is presented below.

Political shifts resulted in changes in institutional oversight of the programme several times during the implementation of the SNC programme. The programme, which was initially housed within the Ministry of Physical Development, was later housed in the Ministry of Economic Affairs, Economic Planning,

¹⁰ The Credit Union league's main clientele are individuals who would not readily be able to access financing from commercial banks.

Investment and National Development in 2006. By 2008, the programme was again housed within the Ministry of Physical Development and the Environment. In 2011, during the final stages of the programme, it was again moved to another Ministry, the Ministry with responsibility for Sustainable Development, Energy and Science & Technology. These changes sometimes resulted in lags in implementation, which reflects on the overall effectiveness of programme implementation. One of the ways in which Saint Lucia ensured that the programme was not unduly delayed by the institutional changes as a result of political shifts was to ensure that the signatories for approval of finances and for the project and overall management remained unchanged.

Time Constraints: The SNC process focused on several critical sectors for Saint Lucia and therefore required input from stakeholders representing these sectors. The multi-stakeholder process, however, was not without its challenges, as the programme required dedicated staff time from various government and private sector agencies. Difficulties were sometimes experienced in the scheduling of the various team meetings, allocating time to provide feedback on documents with a view to finalizing them and the like. In an attempt to submit project deliverables on time some teams allowed their members to work on individual components and submit via email for round-robin and only met at critical stages of compiling sector reports. In other instances work load was assigned based on the flexibility of team members to deliver in view of other commitments.

Data constraints: Paucity of data and data gaps within relevant agencies also affected the pace at which work was completed. In the case of the Greenhouse Gas inventory, proxy data had to be used in some instances. There were also instances where data had been collected but had not been converted to a form which could be used by agencies other than the collecting agency. In the case of map sheets for input into the GIS sector report, some were only available in hard copy and this limited the extent to which the GIS expert could manipulate the data, given the time constraints. Incompatible formats of data also existed, as well as the lack of metadata. Some of the data constraints could not be fully addressed under the SNC programme. Going forward under the Pilot Programme for Climate Resilience many of the data needs for climate change will be stored in a Geonode data system. This system will not only store climate related data but the associated metadata as well. Although all agencies recognize that data collection is essential to sound decision making most have not been able to overcome the hurdle of allocating sufficient human and financial resources to the task. The Geonode data system under PPCR allows will be critical in addressing some of the data related issues.

The sectoral nature of the assessments: While structured around the planning process of Saint Lucia, this was also a challenge with respect to integration and mainstreaming, as “the big picture” is necessary for informed decision-making and effective action. Recommendations in one sector influence and are influenced by the recommendations from another sector. This posed challenges for compilation of the final document. Notwithstanding some of the sector teams engaged each other where there were very obvious linkages, the various sectoral reports sought to make these linkages. Also some of the sectors reviewed by their nature had an overarching scope such as the water resources sector which was used to provide the impact on all sectors from a water resources management point of view as was indicated earlier in this paper. The financial services sector report also provided analysis on how financial services would need to respond and its implications for all other sectors.

Public sector administrator buy-in: Another major hurdle which had to be overcome was securing the approval of Public Sector administrators to provide financial incentives for public servants while building their capacity. Hiring outside experts would be more costly to the programme and would still require input from the very technical officers whom administration was not willing to compensate. Sensitization of Public sector administrators was crucial to ensure that national experts were utilized under the SNC programme. The benefits of building capacity while providing incentives where national expertise existed should be preferred to hiring regional or international consultant had to be reiterated. This sort of sensitization will need to continue as Public Administrators change and until the practice of remunerating public sector official while building capacity becomes an accepted practice and is not done

on a case by case basis.

Deepening Public-Private partnerships: The ‘What’s In It For Me?’ scenario sometimes played out. This occurred where agency representatives were sold on the notion of integrating climate change considerations into their work programmes, while the agency they represented were lagging behind. Private sector partners sometimes made it difficult for staff assigned to the programme. There were instances where it was decided that too much of the individual’s time was attributed to workshops and meetings and fulfilling contractual obligations. It will be necessary to engage private sector entities by relating the importance they place to climate change related activities to the impact which climate change may pose to their various enterprises.

Main lessons

Some of the main lessons, from the implementation of the SNC in Saint Lucia are as follows;

- **Mainstreaming climate change** necessitates that all stakeholders be on board. In the process of engagement, continuous and various approaches should be adopted: both top-down and bottom up. Mainstreaming should not only involve the transfer of knowledge and dissemination of information, but also equipping persons with the tools and resources for integration and effecting change. Further climate change must be reflected in the operations of all parties concerned. If this is not the case then the lead agency would need to prod other agencies to execute their tasks to ensure effective programme implementation.
- **Institutional arrangements** must not be constrained by bureaucracy and political vagaries. The existence of a cabinet-appointed multi-sectoral body greatly assisted in this regard as well as keeping critical individuals to project success constant throughout the process despite changes.
- **Leadership:** There is also need for a champion in the various organizations to follow through and for a clear and direct link between information received, budgeting and programming. There needs to be clear connectivity between the responsible technical officers in the respective organizations who understand and appreciate climate change and the financial analyst/controller, economist, policy-maker, implementer. Linkages should be made to the benefits which agencies can attain but making climate change considerations an integral part of their business.
- **Policy as a means to an end:** The existence of climate change policy is critical but does not necessarily result in effective integration, implementation and desired outcome. Policy must be accompanied by an effective and sustained education and awareness activity which will allow for long term changes in attitudes and practices.

Conclusion

The implementation of the SNC in Saint Lucia highlighted many strengths, such as the institutional structure adopted; weaknesses such as the data constraints; and opportunities to be pursued, including further equipping persons for the tools to successfully integrate climate change considerations in national development planning. No doubt, the work will continue under the Third National Communication process. Like the rest of the Caribbean region, Saint Lucia will continue to forge ahead and embrace the actions which are imperatives for long-term success. Climate change poses challenges which, as a nation, the country must continue to contend with for the very survival of this 238 sq-mile or 616sqkm island, with its population of 166, 526¹¹. With anticipated increased intensity in hurricanes, sea level rise, more frequent droughts and increase in vector-borne diseases, Saint Lucia must, indeed, ‘redeem the times’.

Every programme successfully implemented, every stakeholder consulted, every opportunity to broaden the knowledge base on the island concerning the impact of climate change and every recommendation taken on board and implemented provides Saint Lucia with a fighting chance against climate change. It

¹¹ 2010, Department of Statistics, Government of Saint Lucia

seems fitting, therefore, to end with the words of Saint Lucia's Prime Minister, the Honourable Dr. Kenny D. Anthony, which formed part of his statement to the thirty-third regular meeting of the Conference of Heads of Government of the Caribbean Community on 4th July 2012 in Saint Lucia. *"We cannot afford to leave the winds of progress uncaught when they blow... We must be enterprising, yet perceptive and willing to put into our "common cloud," the store of knowledge and expertise held throughout our states"*¹². This is indeed true for the states of the Caribbean Community, as well as for the various groupings, whether public or private, technician or farmer, men, women or children, which make up the individual states, not the least of which is the fair Helen of the West Indies-Saint Lucia.

Serbia

Using National Communications Process as a Tool to Build National Capacities on Climate Change

By: Milena Kozomara and Natasha Martins, UNDP Serbia

Introduction

Ensuring political support for national communication processes is one of the most important prerequisites for successful project implementation, national communication development as well as integration of climate change into national and development sectors and priorities. When Ministries in charge of climate change issues from the State Union Serbia and Montenegro started preparing the project for their first national communication back in 2004, main concerns were centered on the lack of technical capacities and data availability for the successful implementation. At that time, it did not seem possible that political reasons will delay the start of the process for almost five years. Even though national communications process is often seen as a technical exercise, our experience shows that it cannot be separated from political affairs and in fact can be significantly affected by those.

Complex institutional arrangements, State Union's political separation into two independent countries, sectoral approach and the lack of capacity and data shortage are some of the reasons that delayed the implementation of the national communication process in Serbia. This paper describes the process and main lessons and conclusions that emerged from the development of Republic of Serbia's Initial National Communication (INC), including way forward for the upcoming Second National Communication process.

Overall national communication framework in Serbia and policy integration

Serbia submitted its Initial National Communication in 2010 in line with the commitments to the UNFCCC and almost six years after initial project preparation began. Stocktaking proposal for INC for the State Union Serbia and Montenegro was prepared and approved by the GEF in 2004. Both member states signed the project document in 2005 and launched the preparation of project proposal. Full INC proposal was submitted and approved by the GEF in 2006 just two months before the State Union effectively came to an end after Montenegro's formal declaration of independence in June 2006. After the separation, Serbia continued to be the legal successor of the State Union, however, it remained unclear what will happen to the project and approved funds as those were earmarked for both Serbia and Montenegro. Since UNDP was selected as implementing agency for this project, extensive consultations regarding the project and its arrangements were initiated by UNDP Serbia as well as between the two governments. Consultations ended after a couple of months with an agreement that was signed by both governments stating that the project will, in its initial form, administratively remain with UNDP Serbia, but the activities and budget will be divided by two new countries and implemented by two UNDP offices. Budget allocation was agreed at 70:30 ratio for Serbia and Montenegro, respectively.

¹² 2012, Anthony, Kenny D., Prime Minister of Saint Lucia; <http://www.stlucia.gov.lc/resource/prime-ministers-welcome-remarks-caricom-33rd-regular-meeting-conference-heads-government>

While at the time the agreement was signed it seemed as the most convenient solution, project implementation had not started as governments and ministries mandated for climate change issues in both countries did not find the funds sufficient for successful project implementation. In 2008, UNDP office in Serbia received from the Government of Serbia a request for assistance to secure additional 30% of the project funds for Serbia. After agreeing with the Ministry that the precondition for this additional funding is an uninterrupted project implementation, UNDP/GEF secured requested add-on funding and the new project document was prepared and signed in June 2008.

Stocktaking and consultation processes were carried out in 2004 and identified main gaps and data reliability, priority areas for INC as well as main stakeholders to be involved in the preparation of INC. However, most of these stocktaking findings lost their relevance at the time the project implementation started, which subsequently affected the INC development process in many of its aspects.

The project was executed by the Ministry of Environment and Spatial Planning and was headed by the national climate change focal point and ministry's unit for climate change. The Vinca Institute for Nuclear Sciences was subcontracted by the Ministry for GHG inventory preparation and for the mitigation analysis; and the Institute for Meteorology for carrying out the vulnerability and adaptation assessments. The approach that was undertaken by the Ministry of Environment to implement the INC involved a large number of researchers and academic and scientific institutes but relevant ministries and institutions were involved only to a limited extent. Final draft document was presented in an event that gathered representatives of the NGO sector, industry and media. The information collected through activities undertaken during the project was reported in line with the guidelines for non-Annex 1 Parties and covered the following elements: national circumstances, GHG inventory, vulnerability assessment and adaptation measures, mitigation measures and financial, technological and capacity building needs.

The INC was one of the first projects in Serbia that attempted to involve other sectors and generate awareness on climate change and relationship with strategic planning in those sectors. It also contributed to raising awareness among other state institutions on the need of establishing and institutionalizing the system for collecting climate change related data. Further, the national communication process helped gather teams from various areas to work together. By engaging a large number of researchers the project contributed to creating an important knowledge base within research and academic institutions for future climate change related research activities.

Most of the assessments completed under the national communication process are sector specific and while they provide important data on climate change and its impacts, they still lack an integrated aspect between different sectors that would provide a more comprehensive insight on interactions and linkages with the climate change framework.

The involvement of senior policy representatives in the process was through the participation in the project steering committee with an objective of familiarizing them with the importance of integrating climate concerns into other sectoral policies. However, no closer interaction between policy makers and researchers and academic institutions was made during the project, which is important for future national communication processes and improved research in the area of climate change.

Overall, at the policy level, the national communication process contributed to increased awareness on climate change issues, however, further efforts are needed to incorporate climate change into the national development, policy and financial planning frameworks.

Integrating scientific and research assessments across and between concerned sectors on one hand, and with policy and financial planning instruments and institutions on the other hand would provide necessary multidisciplinary approach and ensure commitment from the highest government level.

Lessons learned and Second National Communication process

The process of preparation of the INC was a breakthrough for the climate change policy and SNC preparation in Serbia. The time gap between the two communications was around one year and as soon

as the INC was finalized, the country initiated the preparations to support the development of the SNC.

Given that the structure and content of national communications is predetermined and well defined in UNFCCC guidelines, the way forward to succeeding in better preparation of the second national communication was to identify gaps and deficiencies of the initial national communication and ensure those are not repeated in the SNC.

Identification of INC shortages began with internal UNDP review and valuable support and inputs were provided by the NCSP as well. Different remarks were addressed to the INC pointing out at the level of national circumstances, methodology applied for the GHG inventory and accuracy of data, and the level of details for adaptation and vulnerability assessment.

Next step was an ex-post screening and review of the INC that was conducted by an independent evaluator. Findings were in line with the ones of the UNDP and NCSP with additional recommendations regarding education, trainings and awareness. Overall, this extensive review and evaluation of the INC provided various useful information and guidelines in which direction the SNC shall be led and which are the weak points of the previous national communication to be avoided in the future. The review did not cover only the technical gaps of the document but also provided clear recommendations on the methodology of running the process.

Following the INC review and evaluation and taking into account all lessons identified, the preparation of Serbia's Second National Communication started. Taking into account the difficulties that the ministry's staff faced during the INC process and the serious lack of human resources and capacities to deal with the extensive process of preparation of the INC, the Ministry decided to seek UNDP support for implementing the project. Nevertheless, the national institutions were actively involved during the process of preparation of the Project Document and still very eager to cooperate on the SNC.

The main problem that the Ministry was facing during the INC and continues to face under the SNC is understaffing. The climate change department counts only four people, including senior Ministry staffs, who is at the same time the country's focal point for the UNFCCC, which assumes many responsibilities and diverse engagements. Except for the head of climate change department, the rest of the staff is quite junior and insufficiently knowledgeable on the process of NC preparation and implementation. The Ministry is also facing problems with interruption in the institutional memory by the change of staff due to elections and political changes or because of staff fleeing to other institutions/private sector due to better employment opportunities and motivations.

Conclusions

The preparation and implementation of Serbia's Initial National Communications project generated a number of lessons that will be used to improve the preparation and implementation of future national communications as well as other climate change and adaptation related projects. The main lessons include:

Capacities on both institutional and individual levels need to be strengthened. The inadequate human capacities of the Ministry to follow on the development of the SNC will be bridged by the solution to have additional human resources recruited through the UNDP/GEF project. Three thematic coordinators are to be hired covering the three main activities of the SNC: vulnerability and adaptation, GHG inventory and climate change mitigation. The posts are envisaged to be covered by national specialists in the related areas who will be assigned to the Ministry during the preparation of the SNC for the three respective components. Those specialists will on one hand provide expertise and advise in the technical relevant areas and will, on the other hand overview all activities going on within their components. Since these technical experts will work closely with the relevant ministry, their work will be mainly facilitated by the Ministry's climate change unit.

The need of involving all cross-cutting sectors in the preparation of national communications is of paramount importance as climate change is a horizontal issue and does not only concern only

environment but rather is featured by economic and social dimensions too. The screening of the INC pointed out at weaknesses related to common knowledge on climate change at cross-sectoral level. In order to remedy this issue Thematic Experts Working Groups will be established. These groups shall be composed of technical experts in the given area representing sectors affected by climate change. The idea is that not only public and governmental institutions are participating into these groups through their representatives but the private sector too. It is expected that the work in these TEWGroups will provide support to the implementation of the respective activities in the SNC but also increase the knowledge and awareness on climate change outside the borders of the Ministry of Environment by covering the sectors like energy, transport, agriculture, forestry, national resources, economy, education etc.

Better integration across sector research and between research and policy institutions is needed to ensure sustainability of climate change scientific and research activities on one hand and integration of research results into policy making on the other. National communications should not be seen as UNFCCC reporting requirements only but also as an important national development and policy tool. Participation of researchers in TEW Groups will be the first step to addressing this issue coupled with regular communication with national research institutions aiming at identifying further steps for strengthening national research communities and facilitating their integration into climate change. It is expected that enabling the dialog between researchers, technical experts and decision-makers will contribute to better integration between research and policy institutions.

A stronger emphasis on the component of knowledge, training and awareness at a much larger scale than it was done in the previous communication is also envisaged. The general feeling is that the national capacities in the area of climate change are very limited, rather weak and a huge demand exists to work on improving this problem. In order to address this issue, a training need analysis will be conducted in order to identify the priorities for trainings in the different sectors. It is expected that the capacities of the relevant sectors will be increased in order to deal better with climate change adaptation and mitigation. Thus, a systematic approach is needed in improving the general awareness on climate change but also providing the public with knowledge and education on climate change. One of the ways to address this issue is to initiate active discussions with national authorities on investing into education and outreach related to climate change. Next, public and private agencies and organizations that can contribute to raising public awareness will be identified. Also, a range of campaigns and public awareness activities will be conducted through all kinds of media, including social media.

Political commitment and support to the process is necessary in order to ensure that all relevant sectors are on board and that roles and responsibilities of all sectors in integrating climate change into other sectors and policies are recognized and clear. Acknowledging climate change as a development issue and not just environmental is a goal that Serbian next national communication projects should aim for in the future. The development of Serbia's SNC will start with establishing a national NC coordinating entity with strong leadership. This role will be with the current ministry on charge of environment that will be supported with senior technical advisers provided by the project. One of the first tasks will be to find ways to integrate climate change at the highest level possible thus ensuring sufficient political commitment for the process as well as for the integrating climate change into other issues.

One of the primary and most often cited constraints cited by countries preparing the national communications include addressing data gaps, data management and data uncertainty both in terms of climate and other nationally generated data.

Countries have also highlighted that it is important to access, manage and centralize data efficiently.

Given that the quality of the outcomes of the NC process lies on having adequate and basic data for providing qualitative reporting. In order to achieve this it is important that policy and institutional structures are in place for ensuring the access, management and storage of data obtained during the National Communication processes. This will ensure a sustainable national communication process and outcomes that are reliable, consistent and transparent.

Given that data collection for GHG inventories is very much rooted in national contexts and requires very specialized information, some countries have suggested different solutions such as the one that proposes that sector ministries should be responsible for proper data collection in their respective sectors.

The following countries are depicted in this chapter:

- 1. Sri Lanka** Constraints related to Data Issues: Data Availability and Accessibility
- 2. Suriname's** Experience in Developing National Communications to the UNFCCC

Sri Lanka

Constraints Related to Data Issues: Data Availability and Accessibility

By: Kema Kasturiarachchi, Environment Management Officer, Climate Change Division, Ministry of Environment, Sri Lanka

Background

Sri Lanka ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 16 March 1993, and has submitted its Initial National Communication (INC) to the UNFCCC on 27 October 2000. Following the preparation of its INC, the country has initiated efforts to create an institutional set-up that seeks to mainstream climate change issues into the national legal Framework. Moreover, its INC provides compelling evidence that, by global standards, Sri Lanka is one of the nation's most vulnerable to climate change and sea-level rise and other extreme weather conditions like drought and floods. In compliance with its obligation as a non-Annex I Party to the UNFCCC, Sri Lanka completed preparation of its Second National Communications (SNC). The activities within the SNC are a continuation of and an improvement of the work done under the UNDP/GEF supported Climate Change Enabling Activity (CCEA) – Phase I & II, where Sri Lanka prepared its INC and built capacities to understand the effects of climate change in number of sectors. Project plans to pay special attention to address gaps and constraints identified during the SNC stocktaking exercise, making good use of the information derived and utilization of the results of relevant previous or ongoing national or international activities related to the climate change issues.

Sri Lanka has completed its Second National Communication on Climate Change and submitted it to the UNFCCC Secretariat on 16th March 2012. The National Communication process includes several technical components such as GHG Inventory, Mitigation analysis, Climate risk and Vulnerability and Adaptation Assessment, an analysis of integrating climate change into development, as well as a Technology Needs Assessment. The preparation of the SNC paid special attention to address gaps and constraints identified during the SNC stocktaking exercise, making good use of the information derived and utilizing the results of relevant previous or ongoing national or international activities related to climate change issues. However, during the SNC process Sri Lanka had to face several issues due to lack of country specific data and relevant information.

With some lessons learnt experiences from the Initial National Communication, the SNC preparation was improved. However, there were some barriers due to inadequate data and information which affected the quality of output. During the National communication process we were able to get a wider stakeholder participation which was quite satisfactory.

Major outcome of the Second National Communication Process

Vulnerable sectors for the climate change impacts were identified and developed recommendations of adaptation under priority sectors. As a result of the mitigation analysis and assessment, mitigation options could be developed. These findings are very much useful for the development of climate change policy and incorporating the climate change concerns into the national development plan.

1. Several awareness programmes were carried out by government officers, teachers and school children
2. Prepared awareness materials, video documentary on climate change.
3. Training programmes on GHG Inventory preparation were held for the relevant sector government officers.
4. Financial Support to carry out climate change research studies.
5. Identification of further research needs e.g.: the new crop development needs as follows;
 - Varieties tolerant for submerged and salinity
 - Varieties tolerant to high temperature and water stress conditions

- Varieties efficient for water and fertilizers
- Weeds smothering ability

5. Launched website for Climate Change Division as www.climatechange.lk

6. Developed National Climate Change policy for Sri Lanka

7. Recognized the adaptation measures for vulnerable sectors

Main challenges encountered during National Communication Process

The Preparation of National Communication required a large amount of data from a wide range of sectors, the data for which is provided by many different ministries and government organizations. The NC process requires having adequate data for vulnerability assessment and adaptation, for the GHG Inventory preparation, and for the mitigation analysis. Therefore, the project team decided to establish a thematic working group for each component with comprising experts from the relevant fields to support the recruited national consultants. Accordingly, there were thematic group meetings held whenever necessary to obtain their contributions for the SNC process. In some cases the project team could not get 100 percent involvement of the experts in the process, since they have other commitments besides the NC. Further, these experts did not have a clear cut idea about the required data, especially for GHG inventory analysis and mitigation analysis. Another issue regarding the data gap is not having a data bank on climate change issues in Sri Lanka.

Sri Lanka has a separate Department called Census and Statistic for the collection of socio-economic data and for publishing of these data. Data on agricultural activities including extent and crop production, livestock population and other socio-economic sectors were sourced annually by the relevant departments and institutions. However, the existing data and information in many areas do not meet the requirement for the GHG Inventory preparation, Mitigation analysis, climate change risk assessment, and socio-economic impacts assessments.

Therefore, prior to starting the Third National communication project, it is essential to fill the data and information gap by establishing an appropriate mechanism to maintain climate change related data base and training of relevant officers to ensure the completion of national communication process in successful manner.

Highlighted main lessons of the Second National Communication process

GHG Inventories

Although the preparation of the GHG Inventory required large number of activity data from a wide range of sectors, the data available in the relevant institutions was not adequate. The country has used the IPCC default emission factor to calculate Sri Lanka GHG emissions; consequently the calculations do not reflect the country conditions and the margin of error is considerable. Furthermore, if Tier II were to be used for calculating emissions of the Transport sub sector, the sector with the highest emission, not only the data on different types of vehicles in use in a given year needs to be known, but also fuel consumed by each one of them. This information can only be estimated based on the statistical modelling whose accuracy is not known. And also the emission of Methane from agricultural activities such as rice cultivation and ruminant animal rearing require *disaggregated* data which is not available.

Vulnerability Assessment

Even though the term of vulnerability was used during the Second National Communication (SNC) Process, there has been no adequate data for quantitative estimations of the degree of vulnerability. Accordingly, direct expressions on degree of vulnerability could not be done properly. The national project team has tried to obtain relevant data by having several workshops and thematic working group meetings for relevant sectors. However, the data gap is still a problem.

Specific needs to fill the gap

Capacity needs - The project management team, the consultants, government officers, other experts

that are involved in the national communication process need to be trained to build their capacity to carry out the TNC process in a successful manner.

In order to identify the actual climate change data such as rainfall pattern, temperature trends and other parameters need to be analyzed. Therefore, it is very important to train the NC team and relevant stakeholders regarding all the issues encountered under the NC process especially Management of Information and data; and setting up a Database Management System. In order to set up a data management system it is important to collect, analyze and store data using the appropriate methodologies. This is crucial for producing a reliable vulnerability assessment, a quality GHG inventory and for identifying accurate mitigation options, and for producing a trustworthy socio economic impact assessment. It is also important to have the data in the corresponding format and keeping the data for future studies or reference.

Considering technical issues prevailing in the NC process it is very important to develop the capacity to use techniques available for downscaling global projections to regional and national level. Further, having meteorological data in the digital format is very important. Therefore, providing training opportunities for scientists to use technologies for scanning charts and converting them into a digital format is vital in order to maintain the accuracy of the climatic data. Developing the knowledge and skills on GIS mapping is another area to be improved. It is essential to train the appropriate personals on utilizing the crop modelling and hydrological models

Research Needs

Further research and development activities should be carried out to scope the data gap. E.g.: development of resistance varieties for drought, submerged conditions, heavy winds, salinity and pest and diseases.

Recommendations

- **Strengthen in-house capacity**
National communication under the UNFCCC is a continuous process. Therefore, Parties should have a permanent team for NC that has the capacity and experience to undertake the process continuously. Taking into account the Sri Lankan situation, the national focal point for the UNFCCC and KP is the Ministry of Environment. Under the Ministry of Environment, the Climate Change Division has been established to implement the activities regarding climate change. Accordingly, the in-house capacity should be developed to continue the NC process in a successful and continuous manner.
- **Establishment of proper coordination mechanism**
During the SNC process Sri Lanka had no proper coordination mechanisms among the stakeholders. Therefore, prior to commencing the next NC process, effective brainstorming sessions should take place in order to increase awareness of the issues and for getting maximum contribution/support to the NC process.
- **Establishment of a permanent Team to carry out the National Communication process**
In order to get continuous support and services for the NC process, a national team needs to be established. The technical capacity of this team should be improved and also be kept as a permanent team.
- **Establishment of database management system**
Establishment of appropriate data management system is a vital requirement. Currently, a proper mechanism has not been established. Considering the current situation on data issues, quick actions should be taken. Setting up a specific policy for climate change related data base management, sharing, and access to information as well as networking is important.
- **Setting up a legal measures and incentives for participation in the preparation of GHG inventory**
Preparation of GHG inventory is a national requirement, therefore all sector agencies should be responsible for sharing data and information.

Conclusion

In order to complete the next national communication process in a successful manner the identified gaps need to be overcome:

1. **Strengthening the National Communication Coordination Mechanism.** The NC Coordination Mechanism should be strengthened prior to commencing the TNC. Appointing a permanent team for the National Communication Process needs to take place. Improving their technical capacities and skills is important in order to undertake a successful National Communication Process.
2. **Establishment of appropriate data base management system.** Lack of climate change related data is one of the major issues faced by the NC team. Therefore, establishment of database management system is an urgent need to produce a reliable and coherent NC report.
3. **Strengthening of existing networks for sharing climate change related information.** Developing a specific policy for climate change related data management, sharing access to information and networking is very important. Further facilities to access climate related networking for general public need to be provided. This will increase awareness regarding climate change.
4. **Capacity building for the national communication team.** Brainstorming and training sessions on guidelines for NC, GHG inventory preparation, vulnerability assessment, mitigation analysis and utilization of climate modelling and crop modelling, GIS mapping, climate data analysis etc. should be carried out to build the technical capacities of the NC team.
5. **Identify research needs** must be implemented in order to cope with the data gap.
6. **Development of proper mechanisms** to mainstream the national communication outcomes into the national development agenda.

Suriname

Experience in Developing National Communications to the UNFCCC

By: Nancy del Prado – Project Manager

Introduction

Suriname faced a number of challenges during the preparation of the Initial National Communication (INC). Some of these challenges were dealt with while others remain. The inability to resolve these challenges could be because national communications are considered a project based activity rather than being an ongoing process. A number of recommendations from the INC are integrated in the Development Plans. However, implementation could be more progressive. In practice, implementation depends on political will and availability of funding from donor agencies.

The Second National Communication (SNC) had a delay in the start. Although the project document was signed in July 2009, the project manager was contracted in May 2010 while the consultants actually started after the inception workshop in November 2010. Most of the actual work of the GHG consultants started in the beginning of 2011. Due to the Government administrative procedures, there have also been some delays in contracting and signing of letters during the first phase of the project. Training of the government staff and the Project Manager in UNDP procedures has contributed to the improvement of the administrative process. Most of the delay at the moment comes from overdue submission and approval of these reports. Although some challenges remain unresolved, it should be recognized that national communication (NC) preparation is an ongoing process in resolving financial, institutional and capacity challenges as well as other challenges which may arise.

Challenges with regards to data constraints

Data constraint was an overall challenge in the preparation of the SNC. This paper mainly focuses on the constraints experienced by the consultants responsible for the GHG inventory. Under supervision of the

GHG team leader, 5 sub consultants conducted the inventories on the following sectors: Energy, Agriculture, Industry, and Waste and Land use, land use change and Forestry. Below, there is a description of the challenges faced by the consultants.

Energy sector

The consultants responsible for the GHG inventory within the energy sector experienced major challenges in the gathering, processing and interpretation of data.

Data availability

Some delay in data collection was experienced due to a lack of readily available information necessary for the GHG-inventory. These data sources do not recognize the necessity of generation or gathering and submitting the data, as it is not considered to be part of their core-business. In addition, they (mostly the private sector) needed to be convinced that the data would not be used for purposes other than the GHG inventory. The Ministry of Environment (ATM) therefore provided the SNC consultants with supporting letters for the stakeholders (data sources).

In general, greenhouse gas emissions are calculated by multiplying fuel consumption by the corresponding emission factor. The type of data to be collected would thus only be based on the fuel consumption (or fuel) combusted in the source category. The tier method as described in the 2006 IPCC guidelines has been applied. The focus, when questioning the sources (respondents), was therefore more on their quantities of fuel consumption. During the data gathering phase it was noticed that the majority of the respondents have poor data/information filing system(s) while they were also not committed to seek for the data due to the lack of awareness on the importance of such data. This resulted in a delay.

Recommendation: The country should not wait until the preparation of the Third National Communication to address the data availability issue. During the awareness sessions under the TNC project, stakeholders must be made aware again about the importance of data collection and their role and responsibility in this process. Beside the creation of legal measures to safeguard the inventory, it is also recommended to give incentives to stakeholders who participated in the inventory. This can be done by providing them with a simplified survey about their own CO₂ emissions related to their fuel consumption. This would create more ownership under the stakeholders in participating in the next GHG inventories. The ownership could be even more increased by providing them with simplified worksheets to record their fuel consumption and they can measure what their related CO₂ emission is. They can use this information to measure the efficiency of their transport or production process. This way, record keeping can become part of their core business while GHG mitigation is automatically being promoted.

Another recommendation is to work through branch associations/umbrella organizations (oil companies, mining companies, etc) to enhance awareness and build capacity on GHG inventories.

Inconsistency of data

In certain instances the received data was not always complete; for instance, not all the used fuel types were mentioned. In addition, while crosschecking data with other sources there seemed to be inconsistency in data. For example the figures regarding the import of fuel from the Bureau of Statistics and Central Bank differ. Another example concerning inconsistency in data is the amount of fuel used to produce gold. Two sources were consulted about data-material and both sources gave different quantities of fuel used for the production of gold. These issues caused delays in collection and processing. In other instances data was not available from the time period it was requested.

Recommendation: Capacity building of stakeholders (through branch associations) in data gathering and filing. The Ministry of ATM should be responsible for the coordination of capacity building activities.

Data-processing, software glitches and data interpretation:

Throughout data processing some flaws were noticed during the data input into the 2006 IPCC

software.

The lack of options in the software to correct errors in input and actions hampered data processing. Diverging or incorrect interpretation of the data, due in some cases to insufficient insight in certain subject components, has often led to misunderstandings within the energy group.

Uncertainties

After having received data from different sources, it was noticed that some uncertainties had occurred in the data-material:

- Not all data has been well provided by the companies: sometimes there is no clear distinction between production fuel and transport fuel
- Type of used fuel is not always clear. Often the quantity of gasoline consumed is unknown.
- Occasionally contradictory data is received (e.g. gold sector). In this case (the amount of fuel needed for the production of one kilo gold), the choice was made to use data which is supported by documentation and the practical situation
- Inaccuracies in the supplied data may also occur.
- Factors such as smuggling and resale are difficult to capture. Through desk research it is sometimes possible to get indications. Otherwise estimations have to be made.

Recommendation: Stimulate and train the stakeholders to collect and store data in a format which is compatible to the IPCC software or is easily transferred or transformed into a useful format. The Ministry of ATM is the coordinating Ministry to implement this recommendation.

Industry

In Suriname, like in other countries, fluorinated gases contribute to the effects of GHGs. At this moment, however, it is not possible to make an accurate assessment as to the amount of that contribution due to lack of data on the number of appliances containing these gasses and the types of fluorinated gases which are being used. Approximately 20% of the GHGs emitted by non EIT Annex I countries are fluorinated gases. These countries are far more industrialized than Suriname, so it is unlikely that the contribution of Ozone Depleting Substances in our country is this high. Nonetheless, estimation of 20% can be used as a worst case scenario.

Recommendation: Systematic research would be needed to come up with better conclusions/ estimations.

Waste

The data on waste gathered in Suriname and IPCC scenario data are not always compatible. The division into categories is very different and -just as important- the measurement units are different. Suriname estimates its garbage production in volume, rather than weight, which makes calculations into CO₂ eq not very reliable, or with a high percentage of error. The specific gravity figure that is needed for the calculations could be assessed but would leave much room for error. The IPCC scenarios for comparative countries have been used, with one exception: the generation of wood waste. This figure is quite accurate for Suriname, relatively easy to translate to CO₂ equivalents and definitely contributes to GHG.

Recommendation: For calculation according to IPCC, it would be required that separated garbage collection be implemented in the country. However, it is noteworthy to mention that this would be a political decision.

Agriculture

The category enteric fermentation of domestic livestock was calculated by using IPCC 2006 guidelines.

The Tier 1 approach was selected which is based on simple calculations on the aggregated statistical data and on use of generally recommended default emission factors of continental or global applicability. Animal type's emissions were estimated by using emission factors utilized by IPCC 2006. The estimation of all animal types was based on average emission factors which were representative of the entire

population of each animal type. IPCC 2006 Guidelines present default emissions factors for cattle and non-cattle.

Uncertainties

Given that the emission factors for the Tier 1 method are not based on country specific data, they may not accurately represent the livestock characterization for each country. As a result, the emissions factors include a high percentage of uncertainty. In addition, it can be mentioned that the Tier 1 manure management emission factors are not based on country-specific data; so they do not accurately represent the management characteristics for any given country. The emission factors are thus highly uncertain. Emission factors should be updated for the regions that have experienced significant changes in manure management practices.

In addition to uncertainty in the manure system usage data, there is also uncertainty in the nitrogen excretion data. Similar to manure system usage, the level of uncertainty in nitrogen excretion data depends on the methods used in data collection. There is also a high level of uncertainty in the emission factors that arises from a lack of N₂O production from manure.

The calculations of N₂O also contribute to a level of uncertainty. Indirect N₂O emissions generally account for the majority of the uncertainty in the 1996 estimated global agricultural N₃O source. High uncertainty is to a large extent inherent to biogenic processes like microbial production.

Methane emission from most agricultural systems is the result of several biological processes, which by nature, are highly spatially and temporally. As a result, emission factors are highly uncertain, even when measured very carefully.

The national inventory in the agriculture sector was calculated using rough estimations of fertilizer data, due mainly to the lack of activity data and the absence of country specific emission factors.

Recommendations:

1. Suriname needs to develop the capacity to institutionalize its ability to gather/calculate its own country emissions factors in order to calculate realistic GHG emission so that uncertainties in the future may be reduced.
2. The Statistical Department of the Ministry of agriculture should include the Tier 1 and Tier 2 methods type of data collection in its year statistical books. This will improve the reliability of the activity data, and thus the calculated emissions. It is recommended that the ministry of ATM will coordinate in collaboration with the General Bureau of Statistics and the Ministry of Agriculture on method types of data collection.

LULUCF

IPCC 2006 software and the ALU TOOL were available for processing of the inventory data for the forestry sector. The ALU TOOL could not be used because of the detailed data required for this Tool is not available. The IPCC software 2006 for data entry and calculation of greenhouse gases had some crucial problems:

- The Land matrix did not work properly, while the entry of data on the choices for management type was not possible for some of the land types. The initial IPCC 2006 software version was uninstalled and the version released in 2011 downloaded. This version was an improvement compared to the previous one, but another problem arose when entering data for the category Wetland. Even though the emissions of Wetlands are disregarded in the inventory, it is required to also enter in the land size of wetlands in the Land Matrix to allow a complete data entry and summation of the total land area of Suriname. In the category Grassland is opted to use the Tier 1 method, but the software program seems to be programmed for the higher Tiers. Data handling of the final results also gave problems.

- A major constraint in data gathering is that Suriname lacks a national data base for land management. Land use data is collected and presented by sector institutions responsible for monitoring specific land use categories. This can cause synchronizing problems.
- Recommendation: Coordination of land use data gathering should be done through a central institution for land management.

Steps taken to facilitate the GHG inventory

The GHG consultants experienced a lot of challenges in gathering data needed for the inventory. To facilitate this purpose, a GHG workshop was organized for the sectors involved in the inventory. All stakeholders involved in the GHG inventory participated in the workshop; the SNC Consultants, private sector, government agencies like the general Bureau of statistics, ministries, parastatal companies such as the Electricity Company, State Oil Company, etc. During this workshop general information was provided on the GHG inventory. Each consultant (Energy, Industry and Waste, LULUCF and Agriculture) presented their work plan and the methodology for data gathering and analysis. The stakeholders (Government/private sectors) committed themselves during the workshop to provide information as far as possible. Despite the workshop and the effort taken by the GHG inventory team it is worth mentioning that a number of critical remarks were made by participants at the workshop:

1. It is not their core business to keep statistical data, and it is time consuming and costly.
2. The private sector requested that the data that they will submit will be used for inventory purposes only.
3. The format, in which the information is required and requested, differs from their way of data keeping.
4. A lot of emitting activities are taking place within the informal sector.
5. Stakeholders are not obliged to provide data.

A special form for data gathering was introduced to the participants to be used for this inventory and for future use. However, if stakeholders keep records, it is being done on a voluntary basis.

Although the GHG inventory is a one-time activity, it is important that the data is being gathered and stored continuously and in a format that is compatible with the IPCC guidelines.

Recommendations: The government agencies, research institutions as well as the private sector should be trained on a continual basis. Since the legal base for this activity is lacking, incentives as well as more awareness should be given to promote data collection.

Quality assurance

From the start of the project, the decision was made to only use local consultants to prepare the SNC. Participation of local consultants in this project would first contribute to strengthening local capacity and secondly, to have an advantage for data access. The majority of consultants is teaching at the Anton de Kom University of Suriname and was also involved in the preparation of the FNC. Not all consultants submitted their reports within the set time frame. In addition, multiple revisions were required in some cases. This led to delay in finalizing the chapters. All submitted reports were reviewed by the PM and the counterpart at the Ministry of ATM. Because the review team does not possess the technical expertise on all aspects covered in the SNC, the assistance of the NCSP to review the chapters was requested. The final report will also undergo an overall technical peer review by an international experienced consultant.

Recommendations

The NC process is very important and could also contribute to development planning for the country. The basic data for qualitative reporting lies in ongoing research and data gathering. It is important that policy and institutional structures are in place for carrying out activities in between preparation of the national communications. Fundamental elements of these structures are:

1. Dedicated departments within the Government to coordinate and monitor NC activities. Departments/persons should be specially assigned and trained to coordinate and monitor NC activities on long term, and not depending on a random ruling political party. This way capacity is built within the government.
2. Cross sectoral coordination. This is essential for input of all sectors to the NC process. This should be institutionalized and not on an ad hoc basis for only NC purposes.
3. Ongoing data gathering. The data collection for the SNC has been reported difficult. The overall improvement of National communications in the future is a “work in progress”. This includes having full time personnel who are engaged in data collection, operating under a legal mandate to request data from institutions and corporations. The process would benefit from requesting data on a yearly basis to avoid having a data gap of several years at the time the next reporting starts. In this light it is recommended that a specialized environmental statistics unit within Statistics Bureau is created. Organizations need to be sensitized for making data (suitable for analysis and interpretation) available not only for the purpose of the national communications but as valuable input for development and implementation of national policies on sustainable development and environment.
4. Ongoing research activities. A lot of data to be included in national communications depends on research activities that take longer than the period assigned for the preparation of the National communication. A cooperation agreement with Research institutions, like the University, should be set up. The Environmental Sciences department of the Faculty of Technology of the University of Suriname acknowledges the need to identify the critical areas that are vulnerable to climate change. Through baseline studies and the continuous monitoring of critical measurements, changes can be effectively determined. (e.g. observation of the coastline erosion process, monitor microorganism that thrive at rising temperatures and damp conditions, research on new crops and breeds that are less susceptible to climate change, etc.)
5. Continuous awareness and education/training of institutions, private sector. Due to limited availability of financial resources awareness raising activities are being conducted on an ad hoc basis. The stakeholders need to be aware that Climate Change is everybody’s concern and sensitized in order to cooperate in the preparation of the national communications.
6. It is necessary to implement legal and technical infrastructures that supports effective and efficient data collection, assessments, monitoring and evaluation of climate change related indicators in between communications. As data collection for the GHG inventory is on a voluntary basis and is time consuming and can have financial implications, not all stakeholders are providing full support as requested. It is therefore recommended to create the legal base (e.g. through the statistics law or environmental law) to request data from stakeholders. The only possible way within the timeframe and available budget of the SNC to initiate the implementation of the aforementioned recommendation is through the implementation of an awareness plan that is not only focused on spreading the content of the SNC but also on the weaknesses of the process, the lessons learned and the way forward.

Concluding remarks

The SNC provides not only baseline data but also recommendations for Mitigation and Adaptation. The SNC should not only be used as a reporting instrument for the country, but is rather a document that provides policy guidance to the Government. It provides a basis for further elaborating on a long term policy/ vision for the country on Climate Change.

The quality, intensity and durability of climate change activities, including research, awareness, education, adaptation and mitigation, depend on a long term vision of the Country whereby Climate Change is considered a priority issue.