

*ABSTRACTS of Selected Presenters*

Development Day: 3 December 2005

***Session 1: Linking Development and Climate Change***

***Chairs: Farhana Yamin, Institute for Development Studies and  
Richard Klein, Potsdam Institute for Climate Impact Research***

**Joel B. Smith, Status Consulting Inc.**

**Title:** Incorporating Climate Variability and Change into USAID Development Projects

In order to assess how climate change can be factored into development planning, USAID is examining how adaptation could be incorporated into specific development projects that are likely to be sensitive to climate. Three case studies will be identified through this effort, which will test a method to include climate change considerations into planning for future development projects. Lessons learned from these case studies will be integrated into a guidance manual on adaptation.

One case study is in La Ceiba, Honduras, a city sandwiched between the Caribbean and 2500 meter high mountains a few kilometers from the coast. It is prone to flooding, vulnerable to coastal storms, and was badly hit by Hurricane Mitch. Climate change may likely result in increased sea level and it could increase freshwater flooding risks. With support from USAID, we are examining how consideration of climate change can be factored into plans to develop La Ceiba's coastal area, reduce flood risks and improve drainage.

The second case study is in Polokwane (formerly Pietersburg), South Africa. Infrastructure is being built to supply water to the municipality of Polokwane for urban, agriculture, mining, and other uses in this semi-arid area that is already prone to drought. Climate change could increase risks associated with floods and droughts of greater severity. The water supply and management infrastructure plans will be examined to see how effective, costly, and feasible it would be to make them less vulnerable to severe floods and droughts and other potential risks from climate change. A third case study will be identified later this year.

The case studies involve close consultation with stakeholders about how vulnerability of projects and adaptation should be examined. Initial meetings with stakeholders to scope out analysis have been held and the analysis is underway. Analysis of vulnerability and adaptation of projects will be carried out by researchers in developing countries. Results will be presented to stakeholders in 2006 so they can determine whether designs should be altered to account for potential risks from climate change.

**Andrew Simms, new economics foundation**

**Title:** The Price of power: Micro-generation with renewables – where poverty reduction and tackling climate change meet

Access to energy supports all the Millennium Development Goals but current energy paths threaten to do the opposite and undermine progress on human development. What are our choices, and what are the obstacles for creating a global sustainable energy system.

**Anne Hammill, on behalf of IISD, Intercooperation, PIK, and CICERO**

**Title:** Screening for Mainstreaming Adaptation to Climate Change

The need to mainstream climate change adaptation into development assistance is increasingly recognized, yet most bilateral and multilateral development agencies are only just starting to take an interest. Over the past five years a few development agencies have screened their project portfolios, generally with two goals in mind: (i) to ascertain the extent to which existing development projects already consider climate risks or address vulnerability to climate stress, and (ii) to identify opportunities for incorporating climate change into future projects. As each screening was conducted independently, the broader lessons from each of the screenings have not been systematically analyzed. This paper assesses the screening activities to date, focusing on both the results and the methods applied. Based on this assessment, we identify an opportunity for development agencies to expand their current focus on climate-development linkages and to make adaptation mainstreaming operational. We present a portfolio-screening tool that is currently under development, which will allow agencies to assess systematically the relevance of climate change and adaptation to their ongoing and planned development projects. The tool will be compatible with agencies' institutional procedures, planning mechanisms and modes of operation, allowing screenings to be conducted with relatively little effort.

**Pierre Mukheibir, University of Cape Town, South Africa**

**Title:** Adaptation Strategies for Water Resource Management at Local Municipal Level

Water is a limiting resource for development in South Africa and a change in water supply could have major implications in most sectors of the economy. Current modelling scenarios suggest that there will be significant climate change impacts in South Africa, which are expected to alter the present hydrological resources in southern Africa and add pressure on the adaptability of future water resource management. The western part of South Africa frequently experiences periods of drought. The local communities and municipality have developed various strategies to cope with the variable climate induced impacts.

With this in mind, this paper presents an assessment of the adaptive capacity of small towns and communities in the Northern Cape province to climate variability, specifically drought. A list of strategies currently practiced during climate variability was developed through local stakeholder consultation. A set of sustainable development criteria are presented. The prioritization of these criteria by various government sectors is discussed.

Using these criteria and a simple MCA tool, a priority list of strategies has been developed that would most likely reduce vulnerability to climate change induced impacts and ensure future water security. Finally, constraints and barriers to achieving the successful implementation of these strategies are discussed.

**Julio García Vargas, National Environmental Council - CONAM**

**Title:** Climate Change Action in a framework of development: case studies for the Piura and Mantaro basins in Peru

We detail the experience of the PROCLIM Program as a case that may assist policy makers and practitioners to grasp a robust conceptual and hands on framework to structure activities targeting climate change in a framework of development. This case depicts the ways to trigger and optimize capacity building activities considering climate change as a menace to sustainable development. We identify and analyze the operative synergies between climate change and development action in the Piura and Mantaro basins of Peru. Among the benefits that will be discussed in detail are the implementation of raising awareness strategies, top-down and bottom – up approaches for adaptation proposals involving local communities and government agents at the local, regional and national levels and the participative design and implementation of regional measures and official decrees targeting climate change and development integrating Development, Disaster Management, Adaptation Science, Community-based Adaptation and Climate Change

**Ian Burton**

**Title:** The Munich Climate Insurance Initiative

There is a problem of climate change and increasing disaster losses that threaten development, increase poverty. There is an opportunity for insurance to play a role in spreading risks and promoting adaptation. There is a range of possible instruments and there are some serious obstacles that need to be addressed. Some form of public private partnership is needed. Things are beginning to happen spontaneously with leadership from international financial institutions. There is a need to generate more participation, more technical inputs, more awareness and more momentum.

Recommendations:

- Insurance must gain a prominent place on the climate agenda.
- More pilot projects and experiments are needed.
- Links and integration with a reformed disaster assistance effort are needed
- SBSTA should take up insurance in its new 5 year programme of work on adaptation.
- Insurance planning should occupy an important place in the post-2012 negotiations,
- The MCII stands ready to cooperate with other interested parties in feasibility and design studies.

## **Session 2: Health and Climate Change**

**Chair: Bettina Menne, World Health Organization**

### **Kristie L. Ebi, Exponent**

**Title:** Using Disease Surveillance and Response to Facilitate Adaptation to Climate-Related Health Risks

Climate-sensitive vector-borne diseases such as malaria and yellow fever, although controlled in developed countries, continue to be important public health problems in most of the world. Surveillance systems are a key public health measure implemented in developed and developing countries to provide early intelligence on the emergence or re-emergence of diseases at specific locations in time for effective responses to be mounted. These systems currently strain to cope with population growth, increased movement of people, animals, and commodities, and other societal changes. Few surveillance systems account for and anticipate that climate change could facilitate the spread of vector-, tick-, and rodent-borne diseases, including into regions where the diseases are currently controlled. In order to address this additional risk, surveillance systems need to be modified to take into account changing weather and climate conditions, and need to be implemented in locations where climate change may foster the spread of diseases and vectors. Because both weather and disease data need to be monitored, collaboration is needed across sectors on the location of surveillance sites. Effective surveillance systems are timely, have sufficient coverage, good quality data, and have adequate resources for response activities.

### **Rais Akhtar, University of Kashmir**

**Title:** Impacts of climate change on health and people's adaptation strategies in a mountain region

There has been relatively insignificant empirical research on the potential impacts of climate change on health and people's adaptation strategies in a mountain region. However, predictions have been made that climate change will lead to altitudinal rise in malaria and the incidence of other vector borne diseases.

The study, based on randomly selected 200 households from different geographical zones, discusses the scenario of the impact of climate change on health conditions in the mountainous areas of Kashmir, and what types of adaptation strategies being adopted by people living at different altitudinal zones and involved both in agricultural and urban activities. The paper highlights that increased warming in mountainous areas resulted in the reduction in quantity of water available for drinking and irrigation purposes, because of the change in water regime, leading to increased number of waterborne diseases.

Despite the increased cases of waterborne diseases, the study noticed a decline in respiratory diseases as warming increase caused a lesser use of traditional KANGRI (a kind of earthen pot with live coal) during winter season. People perceive that large scale construction of concrete buildings replacing wooden structure, and increased deforestation in mountainous areas, have resulted in increased warming in the region.

The paper also examines the adaptation strategies adopted by inhabitants of different areas of Kashmir mountains. Practices of storing water for summer months, change in house structure-with large windows and doors, and practice of frequent bath, are some of the strategies being adopted by the inhabitants in the last one decade. Use of electric fans and even air conditioners and the fridge have now become important household items for the inhabitants. Some 15-20 years back people hardly felt the need of such electronic items. There is need to conduct micro-level surveys in mountainous areas so that a holistic assessment of people's adaptation strategies may be obtained.

**Stephen J. Connor, International Research Institute for Climate & Society**

**Title:** Anticipation, adaptation and climate risk management for health

Advances in climate science and earth observation offer opportunities to develop and apply new knowledge to real world problem solving. Climate prediction is based on understanding interactions between ocean-atmosphere-land systems. Are we able to see patterns in the interactions - use those patterns to understand climate impacts better - and use this knowledge to predict and monitor changes in disease risk?

Many infectious diseases are climate sensitive – but this recognition alone is insufficient to guide control policy, planning, training and implementation. An integrated approach to epidemic disease risk management, incorporating vulnerability assessment, climate prediction, environmental monitoring, health surveillance, and control response planning has been established. Here we present an example of its adoption in epidemic malaria control in Southern Africa.

Many of the Millennium Development Goals and national targets are climate sensitive, and recognizing the varying context and changes in associated risk are vital – both to *measuring* and *achieving* the MDGs. The Working Group on Climate Change Detection argues we need more effective 'climate proofing' in development planning, policy and implementation. If we can achieve this in the health sector then we go a long way towards increasing the resilience of communities in developing countries facing adaptation to climate change.

**Charmaine Heslop-Thomas, University of the West Indies, St. Andrew, Jamaica**

**Title:** Vulnerability to dengue fever in Jamaica

There has been a significant increase in the incidence of dengue fever in the Caribbean over the past two decades. Recent research has established a link between these epidemics and increases in air temperature some of which occurred in El Niño years. There is however a deficit of studies regarding vulnerability and adaptability to increased dengue transmission under a changing climate. This study examined vulnerability to increased dengue transmission in one Caribbean country namely, Jamaica, under a changing climate. It adopted a mixed methodology –expert interviews and a questionnaire survey backed up by secondary data to assess the capacity of the country to respond to any crisis as well as its capacity to respond to the challenges posed by outbreaks of dengue fever. The results of the study revealed that Jamaica's inability to achieve any real economic growth since the 1970s has affected its ability to respond to any crisis including a dengue epidemic. Interviews with the Ministry of Health revealed that resource problem limits the ability of this organization to respond adequately to present conditions regarding dengue and interviews conducted with other public sector agencies revealed that the threat of sea level rise to the country was their foremost concern.

**Ana Rosa Moreno, The US-Mexico Foundation for Science**

**Title:** The Socio-Economic Benefits of Climatological Services to the Health Sector

The ability to forecast weather has greatly improved in recent years, especially with the use of remote sensing. The increased accuracy of climate predictions, and improving understanding of interactions between weather and infectious disease, has motivated attempts to develop models, which predict changes in the incidence of epidemic-prone infectious diseases. Such models are designated to provide early warning of impending epidemics which would be invaluable for epidemic preparedness and prevention.

Weather and climate forecasts and early warnings may be used to provide information, which enables and persuades people and organizations to protect themselves and their property, and thereby reduces the deaths, injury and damage caused by the hazard. EWSs should be understood as credible and accessible information systems designed to facilitate decision making in the context of disaster

management agencies in a way that empowers vulnerable sectors and social groups to mitigate potential losses and damages from impending hazard events

EWSs can have direct health and economic benefits. Large regional variations in economic value are to be expected, because of the different mitigative and adaptive policies needed in different parts of the world and the flexibilities in response which only some regions will be capable of.

### **Session 3: Disaster Management and Climate Change**

**Chairs: Madeleen Helmer, Red Cross/Red Crescent Climate Centre and Sarah La Trobe, Tearfund**

#### **Ralf Ernst, Technical Advisor Climate Change (UNOPS), CDMP**

**Title:** Climate Change and the Comprehensive Disaster Management Program (CDMP) in Bangladesh

**Presenter:** Tarik-ul-Islam, UNDP, Bangladesh

Bangladesh is a disaster prone country due to its geographic location, and climate change will enhance the country's risk to be subject to even more climate-related disasters, such as floods, droughts, tropical storms and cyclones.

In 2004, the Government of Bangladesh in cooperation with DFID and UNDP, started implementation of the Comprehensive Disaster Management Program (CDMP). The CDMP aims to achieve a paradigm shift in national disaster management from a conventional response and recovery approach to a more comprehensive risk assessment and reduction approach. For the first time, possible climate change impacts are being included in the risk assessment process and in disaster preparedness and management activities.

Integration of climate change into the Comprehensive Disaster Management Program is being achieved through

- capacity-building of government institutions,
- climate change modeling,
- strengthening the knowledge and information basis on climate change,
- strategies for awareness-raising, advocacy and coordination, and
- pilot projects to support livelihoods adaptation to climate change in the agricultural sector.

The presentation provides an overview of the status of project activities.

#### **Pablo Suarez, Boston University Department of Geography**

**Title:** Reversed mainstreaming? Rethinking the role of climate change in community disaster management

The climate change agenda is increasingly embracing the concept of "mainstreaming": promoting adaptation by integrating policies and measures to address climate change into ongoing sectoral and development planning and decision making. While mainstreaming is seen as a more efficient way to use resources at the macro level, practitioners on the field report that it is not at all easy to convince vulnerable communities about the need to invest in long-term planning, particularly when their most immediate basic needs remain unfulfilled. Drawing from participatory climate workshops at the community level in Argentina, Bangladesh and Mozambique, this paper proposes a new role for climate change information in the context of community disaster management. The main argument is that, in addition to mainstreaming (i.e. forcing) long-term adaptation into existing, more urgent activities, the reverse process can be explored: There is an opportunity to use climate information to strengthen ongoing activities meant to address the immediate time horizon, such as food security, water, health and other dimensions of disaster risk reduction. For example: subsistence farmers in Mozambique tend to explain the 2000 floods or the recent sequence of droughts through supernatural intervention (such as punishment from God, an expression of ancestors' anger, or bad luck). As a consequence they think that these events are unlikely to happen again, therefore reducing their willingness to set up early warning systems or to replace maize by drought-resistant crops such as cassava. Bringing climate change awareness to rural areas can help farmers see that extreme events are more likely to occur again anytime. A participatory process at the community level can create incentives to embrace new practices that are better suited for coping with current variability. While ongoing activities could be used as a vehicle to implement adaptation, climate change information and resources can strengthen existing projects, improving communities in such way

that they will not only improve their short-term horizon but also be better able to adapt to a different climate.

**Rana Izci, Marmara University**

**Title:** Istanbul, Disaster Management and Climate Change

Current urbanization trends bring on competing demands of economic growth and environmental protection in Istanbul like in many other mega cities. However the size and vulnerability of informal settlements in high risk zones with poor building-codes, on the other hand, raise significant concerns for human security in Istanbul when increasing frequency of natural disasters is coupled with climate hazards. Moreover high population growth distresses particularly energy and transport structures, water supply systems and rich local ecosystems within the city on which the resilience of Istanbul and its surrounding area vastly depend. As a coastal mega city with 68 main rivers, as a popular tourist destination and as the most important centre of commercial and financial activities, vulnerability of Istanbul to natural disasters is also one of the key determinants of Turkey's overall vulnerability and adaptive capacity at the national level. The main aim of this paper therefore is twofold: First to question the extent to which Turkey Climate Change Enabling Activity Project can provide fundamental tools to increase adaptive capacity of Istanbul and secondly to explore whether adaptation policies to climate change can contribute to disaster preparedness of any kind and risk management in Istanbul.

**Ana Rojas, Both ENDS**

**Title:** Disasters and Non-governmental and Community-based Organizations

Climate change is expected to lead to an increase in the number and strength of natural hazards produced by climatic events. This paper presents examples of how non-governmental organizations (NGOs) and community based organizations (CBOs) have experienced variations in climate, and how they have been incorporating their findings into the design and implementation of local adaptation strategies. Local organizations incorporate climate change and climatic hazards into the design and development of their projects. Projects designed to increase the resilience of local livelihoods are good examples of local adaptation strategies. To achieve up-scaling of these initiatives, there is a need for improving information exchange between NGOs, CBOs and academia. Moreover, there is a need to bridge the gap between scientific and local knowledge in order to produce projects capable of withstanding stronger natural hazards.

## Adaptation Day: 4 December 2005

### **Session 1: Adaptation Science**

**Chairs: Neil Leary, SysTem for Analysis, Research and Training (START) and Tony Nyong, University of Jos**

**Monica B. Wehbe, Universidad Nacional de Río Cuarto**

**Title:** Macro-Economic Reforms and Agriculture Policies In Developing Countries: Impacts On Social Vulnerability In The Argentinean Pampas And Mexican Coffee Sector

While climate is a primary determinant of agricultural production, agricultural systems are also highly sensitive to other stressors such as socio-political changes. Not only can the simultaneous impact of environmental and socio-political stress produce new circumstances of livelihood insecurity, but also the responses of farm systems to socio-political stress can alter their sensitivity to future climate impacts.

The 1990s were a decade of radical change in both macroeconomic and sector policy for many Latin American countries. The economic policy agenda epitomized by the Washington Consensus had profound impacts across the continent. Programs of market liberalization, privatization and deregulation were adopted by most of the continent's larger economies in order to facilitate their integration into regional and global markets.

These changes entailed significant restructuring of agricultural production, producing changes in technology, land use and introducing new forms of relationships between farmers and the state. At the farm level, the impacts of these changes have been quite uneven as a function of the existing heterogeneity in the agrarian structure and resource distribution. This paper shows how the transformation of agriculture as a consequence of political and institutional changes has affected the livelihood security and vulnerability of family farmers in two different Latin American socioeconomic and climatic contexts: the center-south of Cordoba, Argentina and central Veracruz, Mexico.

In Córdoba, family grain and livestock farmers have faced a gradual loss of control over land resources and the technology necessary for competitive production. While there have been regional economic gains resulting from these trends, the impact on family farmers has been largely negative, resulting in the expulsion of many rural residents from agricultural activities and rising concerns over the environmental impacts of expansive agriculture.

In Veracruz, after profound domestic and international changes in the structure of the coffee market, the survival of smallholder coffee farmers now depends critically on their capacity to diversify and invest technologically in their production. Past policy interventions in the sector replaced farmers' previous risk coping strategies and generated a strong dependence on the public sector that now is inhibiting adaptation.

The present vulnerability of family farmers is highly tied to these structural changes. In both cases, sector reforms combine with changing patterns of climate variability to increase the sensitivity of smallholder farmers to extreme events and to reduce their capacity to address their livelihood security. Despite important differences in the structure of production in the two case studies, the analysis illustrates how the similar patterns of broad-scale policy change in each country are altering the availability of resources as well as the viability of strategies farm systems formerly employed to address environmental risk. The future vulnerability of the farmers to climatic risk in each case will depend in large part on their capacity to respond to present socio-political stresses.

**Balgis Osman Elasha, Sudan Higher council for Environment and Natural Resources**

**Title:** Adapting to Climate Change: Linking local coping mechanisms to development policies and strategies

This paper is an attempt to provide basic ideas on the impacts of policies and institutions in the livelihood of rural people in fragile ecosystem in Sudan. It is written with the hope that it will help improve the understanding the impacts and the role of policies and institutions in shaping the livelihoods of poor people.

It is based on the outcome of a research work by the AIACC\_AF14 project in Sudan. The project is part of the "Global Assessment of Impacts of and Adaptation to Climate Change (AIACC)" which is funded by the GEF through UNEP, executed by the International Academy of Science and implemented by HCENR. The main objective of this project is to enhance the scientific and technical information, to assess the impact of climate change and to design cost-effective response measures which are needed to formulate national policy options. Three case studies were conducted to assess the impacts of climate change on a range of socio-economic sectors and ecological systems at the national level and develop a range of adaptation options. The goal of the case studies was clarify and establish that certain sustainable livelihoods (and natural resource management) measures increase a community's resilience to today's climate-related shocks, and that it is possible to determine how such measures can be effectively implemented, supported and up-scaled, for lasting impact. To show this, each case study attempted to provide an assessment of SL/EM strategies adopted by the communities as well as assessing the local and national policies and conditions that support or inhibit successful measures. An important assumption on which the project was based is that: sustainable livelihoods can fill the practical and conceptual gap that exists between local vulnerability to climate change and national/ intergovernmental policy processes.

**Rodel D. Lasco, ICRAF Philippines Liaison Office**

**Title:** Tradeoff Analysis of Adaptation Strategies for Natural Resources, Water Resources, and Local Institutions in The Philippines

Our AIACC study assessed climate change impacts on and vulnerability of natural (forest, water) and social systems in the watershed. In addition, we identified potential adaptation options for these systems. This paper presents an approach on how to analyze sectoral adaptation options by looking at the tradeoffs between them. The main target of this paper is policy makers at the local and national level in the Philippines. The approach proposed here requires minimal technical training and could be readily used by the target audience.

Our main hypothesis is that specific sectoral adaptation strategies may complement or conflict with adaptation strategies for other sectors. Adaptation strategies for each sector (natural ecosystems, agriculture, water, local communities) have been identified through multi-sectoral consultation workshops, experts meetings, and focus group discussions. What is lacking is an analysis of how sectoral strategies reinforce or conflict with those of other sectors. For example, one of the adaptation strategies in the forest resources sector is reforestation or planting of forest trees in denuded areas. Such as strategy could lead to lower water yield, adversely affecting water supply for power generation and irrigation. At the same time, tree planting activities may have positive effects on local communities (e.g. greater fuel wood supply).

We conducted a cross-sectoral analysis of recommended adaptation strategies to determine potential synergies and conflicts between them. An attempt was made to identify "best bet" and "win-win" adaptation strategies based on the foregoing analysis.

We conclude that adaptation strategies in one sector could have positive and/or negative impacts on other sectors. Negative impacts should be mitigated and positive impacts enhanced. We have shown that

cross sectoral analysis of adaptation strategies should be employed at the watershed scale to maximize synergy and minimize conflicts.

Our study qualitatively assessed the tradeoffs and cross-sectoral impacts of climate change adaptation strategies in watersheds in the Philippines. Future research should focus on quantifying the trade-offs between sectoral adaptation strategies.

**Evans Kituyi, University of Nairobi**

**Title:** Climate Change Adaptation and Emerging Challenges for African Institution

Integrating climate change adaptation into policy processes and decision making across a range of sectors and scales is a critical next step in managing climate change and its impacts. Efforts to achieve this objective might be undertaken under the direction of the UNFCCC or independently through actions supported by governments. Economic and social development at all levels needs to be undertaken with an eye to ensuring that it is “climate proof” and “climate friendly”. Doing so will require mobilization of human capacity and knowledge, institutions and governance, tools and technologies, and appropriate financial resources. This is predicated on the thought that past failure by African countries to integrate adaptation considerations into key policies were attributed to existing weak policymaking processes, institutional linkages and programmes. The paper reviews mandates and programmes of a range of key regional (African) and national institutions with a view to quantifying their contribution to climate change adaptation in Africa. Specifically, it will establish reasons why the programmes of such institutions have so far failed to influence policy and decision-making processes and propose an alternative institutional framework for mainstreaming the region’s key adaptation concerns into national policy and decision-making programmes in the context of the region’s development agenda.

**Emilio Sempris, Water Center for the Humid Tropics of Latin America and the Caribbean**

**Title:** Mainstreaming Earth Observing System Products into Decision Making in Mesoamerica through the Implementation of the Regional Visualization and Monitoring System (SERVIR)

The Regional Visualization and Monitoring System for Mesoamerica (SERVIR, in Spanish) has been established at the Water Center for the Humid Tropics for Latin America and the Caribbean (CATHALAC). SERVIR intensively utilizes NASA data, technologies, and products to collect, archive, process, model and distribute massive raster and vector data, and implement multiple georeferenced decisions support tools in the areas of climate change, disaster management, land planning, terrestrial carbon stocks, forest fires monitoring, water resources and coastal zone management. Its computation architecture interconnects seven Ministries of Environment of the Central American countries.

Technology transfer and capacity building are integral components of this regional effort. This coupled system, which is the first of its kind, is being developed by NASA at a test-bed facility at the National Space Science and Technology Center (NSSTC), and gradually migrated and deployed in the region by CATHALAC. Capacity building to governments takes place in the form of training workshops and in situ technical assistance in satellite data processing, GIS, DSS, weather now-casting and climate modeling.

## **Session 2: Community-based Adaptation**

**Chairs: Saleemul Huq, International Institute for Environment and Development and Atiq Rahman, Bangladesh Centre for Advanced Studies**

**Barry Smit, Kik Shappa and James Ford, University of Guelph**

**Title:** Community Vulnerability and Adaptation in the Arctic

This paper presents findings from a community-based study of vulnerability and adaptation in Nunavut Canada. The approach was designed to document the experiences of residents in Arctic Bay with changing conditions, especially related to climate, and their adaptive strategies to deal with climate-related risks. The field work was guided by a general model of vulnerability and undertaken by James Ford, Kik Shappa and other local partners, focussing on the livelihoods related to hunting (Ford and Smit, 2004).

Entry points and opportunities for adaptation policy are identified by the research. At a community level, efforts to promote and preserve traditional land based skills, especially among younger generation, will equip them with the skills to deal with current climatic risks and climate change. At a Territorial level, adaptation policy makers will have to work with regulatory regimes to ensure that harvesting quotas and regulations allow for flexibility in light of changes in the accessibility of hunting areas and alterations to the timing of animal migrations predicted.

**Lisa Schipper, International Water Management Institute**

**Title:** A Closer Look at Water Resources Management for Adaptation: Small-Scale Irrigation for Adapting to Droughts in Ethiopia

This paper is based on recent fieldwork for an on-going IWMI-led project to examine the impacts of irrigation development on rural poverty and the environment in Ethiopia. Irrigation is one of the most prevalent types of water resources management for reducing the effects of rainfall variability on crop production and has been applied for centuries in many regions around the world. In Ethiopia, which is highly sensitive to El Niño and its corresponding La Niña, rainfall variability has been considered one of the major causes of recurring famines. Despite this, agriculture in Ethiopia is mostly rainfed and small-scale irrigation development is only now emerging as a possible solution to the country's food insecurity problems. With 85% of the population involved in agricultural activities, climate variability also affects livelihoods on a large scale throughout the whole country. Existing irrigation is considered inefficient, and represents only about five percent of the country's estimated irrigation potential. Nevertheless, there are a number of social, cultural and institutional hurdles to conquer before irrigation can be effective in securing livelihoods in Ethiopia. The project analyses institutional conditions for irrigation in Ethiopia, while quantifying impacts of irrigation development on poverty and environment in order to build knowledge on the impact of irrigation development on the economy, society and environment in Ethiopia. The findings will help guide investments in Ethiopia based on lessons learned about failures and successes in irrigation development to date. But the findings also offer lessons for planning Ethiopia's strategy for adapting to climate change.

With the onset of climate change, planners are looking to irrigation as a possible measure to assist farmers in adapting to changes in rainfall patterns. Thus, one of the project's components specifically explores the potential for irrigation to reduce the impacts of drought on different groups in the vicinity of the irrigation schemes. Based on a detailed study of two irrigation schemes at different locations in Ethiopia, the research examines potential benefits to farmers with and without access to irrigation, pastoralists and other actors, which result from the presence of the irrigation system in the case study regions. Benefits and potential costs to livelihoods are discussed and put into the context of Ethiopia's development picture and the expected impacts of climate change.

The main goal of this paper is therefore to explore the links between small-scale irrigation and reduction of vulnerability to drought to uncover how and whether irrigation can be a potential adaptation to future climate change. Focusing on the role that can be played by improved water resources management to respond effectively to climate risks, the paper outlines Ethiopia's socio-economic situation, stressing the significant role of food aid in dampening stakeholders' creativity and capacity to respond to drought. While irrigation may be an effective tool for defeating short-term risk, adequate consideration of social, cultural and political issues in irrigation planning is vital for the success of such measures in the long term under climate change.

Ethiopia offers an example where reducing vulnerability to drought may have a significant positive effect on improving livelihoods, despite the numerous macro-level issues that currently create barriers to the country's sustainable development. Importantly, irrigation cannot be expected to eliminate Ethiopia's drought risk or to guarantee food security for everyone in the country. However, it may have a considerable impact on empowering farmers who have access to irrigation as well as those living close by. Furthermore, this empowerment could be key to reducing the dependency on food aid that penetrates the country profoundly and ultimately to reducing vulnerability and ensuring enhanced capacity to adapt to climate risk.

**Jeroen Aerts, Institute for Environmental Studies, Free University**

**Title:** Adaptation to Droughts: Developing community based sand dams in Kitui, Kenya

The ADAPTS program aims at supporting adaptation to climate change in water policies at the local scale. One of the ADAPTS pilot areas is located in Kenya within the district of Kitui, 150kms east of Nairobi. During the last 10 years, a local NGO called 'SASOL' has implemented a methodology to mitigate droughts by developing so called 'sand dams'. A sand dam is designed such that water is stored in the sand that is kept behind the dam as an artificial aquifer. In this way, evaporation losses are limited and water can be extracted from the sand in the dry season using wells.

A sand dam cost about U\$ 5000 in material costs and are built through community inputs. SASOL has developed 435 dams in ten years time and have provided safe drinking water to about 60,000 – 65,000 people at an investment of about U\$35 per capita. The average walking distance to water per capita (one of the prime targets of the Kenyan government) has been reduced dramatically and as a result, other economic activities have been started diversifying the income base of families. In general, the increased availability of water boosted agricultural production of the region and has significantly helped communities adapting to unfavorable climate conditions.

Through the success of the project, up scaling to other regions is currently being discussed. However, three issues need to be addressed before up scaling can effectively be implemented. This research provides directions to these issues, which are:

- How vulnerable are sand dams and their users to long term effects such as climate change?
- What are the technical innovations of the dams in order to make them climate proof? How much water is exactly stored, how can the process of community participation for construction be optimized?
- How can institutional knowledge be further developed to upscale the methodology to other regions. For example, how should farmers be organized to build and maintain the dams and which level(s) of government should be involved?

**Daniel Davou Dabi, University of Jos**

**Title:** Incorporating Community-based Adaptation Strategies into Rural Development Policies in a Developing Economy

Agriculture is the major economic activity in the rural areas of sub-Sahara Africa. It provides livelihood and gainful employment for more than 70% of the population. This sector of the economy has suffered from inappropriate policy measures and environmental constraints of climate variability, especially,

recurrent droughts in the Sahelian belt of the region. These conditions are expected to get worse due to climate change (IPCC, 2001). The paper surveys the agricultural development initiatives adopted in past rural developments policies in developing countries: the traditional agriculture times prior the 1950s (the pre-colonial period); the economic-growth- and modernization era of the 1950s and 1960s (the colonial and early independence period); the growth-with-equity period of the 1970s; the economic-growth and policy reform period of the 1980s; and rural development policies during the 1990s. These policies have been mostly based on “top-down” approaches to development which have not benefited the most vulnerable poor rural households. Field survey data and focus group discussions from 27 communities selected from the Sahelian belt of northern Nigeria reveal the wealth of indigenous knowledge systems. The paper therefore calls for the incorporation of community-based adaptation strategies, “bottom-up” approaches into development policies during this millennium to ensure sustainable rural economic development in the area.

**Ahsan Uddin Ahmed, Bangladesh Unnayan Parishad, and Angie Dazé, CARE Canada**

**Title:** Piloting Community-Based Adaptation Activities: Early Experiences in Bangladesh

Adaptation to the impacts of climate change is emerging as a critical concern in many parts of the world. A methodology for community-led adaptation was piloted in the southwestern region of Bangladesh to develop, test and share the knowledge, tools and technologies required to enhance the adaptive capacity of communities. The project design was based on a participatory vulnerability assessment, which identified people’s priority areas of vulnerability and indicators of well-being, as well as current coping abilities. Among the ten elements of vulnerability most frequently identified in the assessment, the majority will be directly affected by the predicted impacts of climate change: salinity, flood, waterlogging, drought, wind/storm, and erratic rainfall.

Preliminary findings indicate that: focusing on practical activities for households to strengthen their livelihood base enhances their capacity to cope by creating a margin of stability for subsistence households; capacity development, awareness raising and advocacy promotes community-based adaptation; and building on the knowledge, contacts, and expertise of NGOs and local institutions contributes to sustainable adaptation. Through the process, reliance on drastic coping strategies was reduced, while participation in local organizations and access to services was increased. A community-led approach to reducing environmental vulnerability can create positive changes in the short term, while at the same time addressing the root causes of poverty and developing adaptive capacity for the future.

**Aliou Faye, IUCN Mali Country Office, and Md. Abdul Quddus, Intercooperation Bangladesh**

**Title:** Assessing and enhancing project impacts on local adaptive capacity – Experiences from Mali and Bangladesh

Since 2001, IISD, IUCN, SEI-B and Intercooperation have been working together to strengthen the role of ecosystem management and restoration activities in reducing community vulnerability to climate change. While the overall goal is to enhance the adaptive capacity of local communities, the initiative’s current entry point is at the project level. Community-level projects may improve adaptive capacity or unwittingly constrain it. Recognizing this, the project partners are currently developing a tool that will enable project planners and managers to assess and enhance a project’s impacts on community-level adaptive capacity. The tool allows project planners and managers to: (1) Identify the impacts of current climate hazards and climate change in the project area; (2) Identify the key livelihood resources that are most affected by these impacts and central to local coping strategies; (3) Assess how project activities affect the availability of and access to these key livelihood resources; and (4) Adjust the project so that the availability of / access to these key resources is strengthened. While the tool is currently undergoing testing, preliminary results from Mali and Bangladesh have demonstrated its value in raising awareness on climate change issues and in delivering concrete project adjustments to enhance community level adaptive capacity.

### **Session 3: Experience with NAPAs**

**Chairs: Tom Downing, Stockholm Environment Institute and  
Bubu Pateh Jallow, Least Developed Countries Expert Group**

#### **Lobzang Dorji, Forestry Division, Bhutan**

**Title:** Experience with NAPA

Bhutan which lies on the fragile mountainous ecosystem of eastern Himalayas is heavily dependent on climate sensitive sectors like agriculture, forest and hydropower. Like any other country, Bhutan too, has off late been subjected to climate extremes and variability. Realizing that the LDCs have limited ability to adapt to adverse impacts of climate change, the decision by the UNFCCC Conference of Parties to create adaptation funds for the LDCs provides good opportunity to address the immediate and urgent needs of LDCs to address the concern.

As outlined in the annotated guideline for preparation of NAPA, Bhutan in its NAPA formulation process, adopted complementary, multidisciplinary and consultative approach. A team was formed with representation from all the government and non-government agencies, and private and semi-government sectors. Based on the vulnerability assessment done for the Initial National Communication, 5 thematic areas (Agriculture and Livestock, Natural Disaster and Infrastructure, Forest and Biodiversity, Human Health, and Water Resource and Energy) were chosen. After conducting the team composition analysis, thematic teams were formed and they were mandated with synthesis of information and data, vulnerability assessment and develop appropriate adaptation measures. The findings of the thematic assessment groups were then subjected to wider stakeholder consultation. The stakeholder composition consists of District Sector representative, Dzongkhag Yargay Tshokchung (District Development Committee) Chairman and Geog Yargay Tshokchung (Block Development Committee) Chairmen from all the 20 Dzongkhags (Districts).

The immediate and urgent adaptation measures were identified based on the thematic assessments and inputs from the stakeholder consultation. Besides lack of capacity and adequate awareness on climate change and its impacts, the NAPA formulation has been successful through the seer effort by realizing the serious implications that adverse impacts of climate change could have on people, their livelihood and environment. However, lack of credible climate data and capacity to conduct in-depth technical assessment on risks associated with climate change impacts have been one of the major huddle in formulating the NAPA.

#### **Momodou Njie and Bubu Patel Jallow, Department of State for Fisheries and Water, The Gambia**

**Title:** Adaptation to Climate Change for Agriculture in The Gambia: an explorative study on adaptation strategies for millet

SWAP-WOFOST, an environmental and biophysical model was used to infer the impacts of climate change projections of two GCMs, ECHAM4, and HadCM3, downscaled to the Gambian situation. The analysis further investigates the question of economic efficiency of adaptation strategies selected on the basis of their potential for minimizing climate change impacts on crop production.

The study demonstrates that climate change impacts depend on the magnitude of global warming, and statistical moments of ECHAM4, and HadCM3 precipitation projections. Whilst irrigation outranks other strategies investigated in terms of crop production potential, its economic efficiency is only guaranteed under specific conditions. All facts considered, no single out-ranking adaptation strategy for agricultural crop production in the future was found in the study. Rather, our results indicate a combination of business as usual with fertilization, in the near future, and irrigation in distant future, as the best way forward.

**Nagmedlin Goubti, Sudan Higher Council for Environment and Natural Resources**

**Title:** NAPAssess: A Decision Support Tool for Use in the Sudan NAPA Process

In the preparation of its National Adaptation Programme of Action, Sudan is using a new analytical tool called "NAPAssess" to establish country-driven criteria by which to evaluate and prioritize adaptation initiatives, and make consensus-based recommendations for adaptation activities. NAPAssess is an interactive tool that facilitates multi-criteria assessment (MCA) in a stakeholder context. The tool is organized around a multi-stage process that consists of identifying vulnerable priorities, defining potential adaptation initiatives, developing stakeholder-driven evaluation criteria, assigning weights to the various criteria, and finally prioritizing initiatives for best meeting the urgent needs of Sudanese communities who are most vulnerable to climate change. The experience thus far suggests that NAPAssess is able to contribute to a transparent, user-friendly process for developing, weighting and applying adaptation project evaluation criteria and is being used to support and simplify the entire NAPA process in Sudan. This is due primarily to the fact that it has been specifically designed to help store information from ongoing stakeholder consultations regarding local vulnerability and potential adaptation options, as well as being a tool for sharing project information with stakeholders from across the country's five ecological zones participating to the NAPA. This paper briefly describes the evolving role of NAPAssess in the Sudan NAPA process by a fourfold focus, a) the use of multicriteria assessment in the Sudan context, b) linkages between the tool and LEG Annotated Guidelines, c) the various computational comprising the tool, and d) an illustrative case study from one of the stakeholder consultations where the tool has been used.

**Mozaharul Alam, Bangladesh Centre for Advanced Studies**

**Title:** Stakeholder Consultation: Experiences and Learning from Bangladesh NAPA

The Least Developed Countries (LDCs) are preparing National Adaptation Programme of Action (NAPA) as a response to the decision of the Seventh Session of the Conference of the Parties (CoP7) of the United Nations Framework Convention on Climate Change (UNFCCC). The Annotated Guideline prepared by LDC Expert Group (LEG) is being used for preparing the NAPA where involvement of different stakeholder including multi-disciplinary team of expert, government and non-government agencies and local level peoples suggested as an integral part of the preparation process. Bangladesh NAPA preparation process has organized four sub-national stakeholder consultation workshops as well as national stakeholder consultation workshop for prioritizing suggested projects to address adverse effects of climate change. In addition, the sectoral working groups have organized meeting with different sectoral agencies on how to integrate adaptation measures into sectoral policies and plans.

This presentation will give an inside of experiences gathered from the regional stakeholder consultation workshops, meeting with different agencies and national consultation. The presentation will highlight main learning including understanding and knowledge of different stakeholders on climate change, barriers for integration into sectoral policies and plans, etc. For example, differentiation of other environmental and development problems with climate related problems was one of the key difficulties during sub-national stakeholder consultation.

**Peniamina D Leavai, Ministry of Natural Resources, Samoa**

**Title:** Samoa's Experience with National Adaptation Programme of Action

This paper shares Samoa's experience in preparing its National Adaptation Programme of Action (NAPA) and the lessons learned from this project. To identify the most urgent and immediate adaptation needs to be included in the NAPA, Samoa developed a unique and highly effective approach and methodology. After two years of comprehensive information and data collection, and most importantly countrywide consultations, Samoa's NAPA preparation project has achieved its objectives.

The Climate Synthesis Report (2004) is one of the major outputs of the NAPA project and has created opportunities for synergies with other multilateral agreements for collaborative and integrated adaptation responses, particularly with the Convention on Biological Diversity (CBD), and the United Nations Convention to Combat Desertification (UNCCD). A nationally driven set of criteria for prioritization has also been developed and utilized to prioritize the adaptation actions in the national programme. The development of Samoa's NAPA has been an exceptional learning experience for those involved, particularly the National Climate Change Country Team (NCCCT) and National Task Team (NTT). By adopting an integrated approach, all the relevant stakeholders (both in government and non-government organizations) are able to work hand in hand to ensure that those whose livelihoods are most vulnerable to adverse impacts of climate change were able to highlight the urgency and immediacy of the adaptation needs.