

The Biodiversity Connection

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The convergence in development thinking on the need to mainstream risks of changing environment is unprecedented. While governments and other agencies have endorsed the need for such efforts, there is no consensus on how to implement them. One area that needs attention is the shift towards thinking that implementation of risk management is the way out as against assessing the fact, if the risk is due to development and growth. Mainstreaming risks is currently a scientific and policy debate rather than a political one

One of the ongoing debates within the Rio Convention processes (CBD, UNFCCC and UNCCD) has been the need for synergies in actions at local level. The Joint Liaison Group set up by the Convention Secretariats is suggesting some ways forward which are being followed by a rigorous study on issues of biodiversity and climate change undertaken by the CBD SBSTTA (Subsidiary Body on Scientific, Technical and Technological Advise) Bureau.

One clear signal that is emerging globally is that mainstreaming risks due to climate change can be addressed through sectoral and cross-sectoral approaches. The sectoral approaches are understood better, while cross-sectoral issues are still poorly understood and have received limited attention

Mainstreaming risks into local livelihoods is also important. The examples of economic planning for disaster management around the world indicate that the climate change vulnerability of people is imminent but can vary

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from marginal to extreme. In the case of extreme events, it is too hard for us to predict the costs. As a result, the remaining option is to manage economic losses by improving disaster preparedness and establishing disaster relief funds. On the other hand, less severe, but measurable events should receive more of our attention. Macro and micro economic analysis of such events are needed urgently. This will help us work with national governments and local communities to develop preparedness plans for the future.

Clearly, science and technology are finding ways of dealing with these emerging dilemmas but they are at a risk of becoming the victim of their own successes. To avoid this, science and technology must meet the society's needs as they generate economic growth.

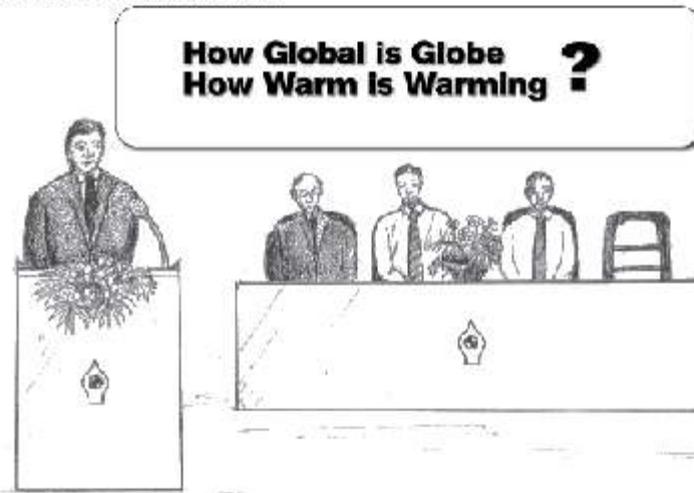
Countries and development practitioners must strive to use development alternatives as well as to refine options for sustainable development by reflecting and challenging issues of increasing poverty and diminishing livelihood opportunities. The costs of adaptation are local rather than global.



Considering this, IUCN Regional Biodiversity Programme, Asia (RBP) is undertaking a range of activities at national and regional levels to bring in synergies not only among the biodiversity, climate change and desertification sectors but also with development planning. During April 2003 the programme organised a Asia Regional Workshop on Mainstreaming Biodiversity and Climate Change in collaboration with UNDP, Government of India and IISD. Details of this workshop and synopsis of the Outcomes are presented elsewhere in this newsletter.

In addition, RBP is currently working at country level on mainstreaming biodiversity into National Adaptation Programmes of Action (NAPA). IUCN in Asia is also beginning several activities on Climate Change and Synergies.

You are welcome to visit our website www.biodiversityasia.org to provide comments and suggestions and to provide us with an opportunity to hear your opinion.



Editor's Note

Dear Connoisseur,

It gives me immense pleasure to present you the latest of *Biolog*, which focuses on climate change and biodiversity. Climate change is a serious environmental concern where national economies are based on climate-sensitive sectors such as agriculture, tourism, and coastal and marine resources. The Asia region with its high population growth rates, low GDPs, higher air, water and noise pollution levels, and limited forest cover is vulnerable to changes in climatic regimes resulting from sea level rise, and increased frequency of floods and droughts

The *Perspectives* section in this issue addresses interlinkages between climate change vis-à-vis sustainable livelihoods and water resources from a developing country perspective. *In focus* highlights synergies between conventions, impacts of climate change on species and ecosystems, the Clean Development Mechanism (CDM) and sustainable development. The *Country and Regional Round-up* section covers impacts of climate change on wildlife in Bangladesh, reports on the dialogue on water and climate change in the lower Mekong region and includes a report of the Asia Regional Workshop on mainstreaming biodiversity and climate change, organized by IUCN-RBP in partnership with UNDP and Government of India.

We hope you will enjoy reading this edition. We welcome your suggestions and inputs for making *Biolog* more informative, technical and responsive!

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The View From Gland

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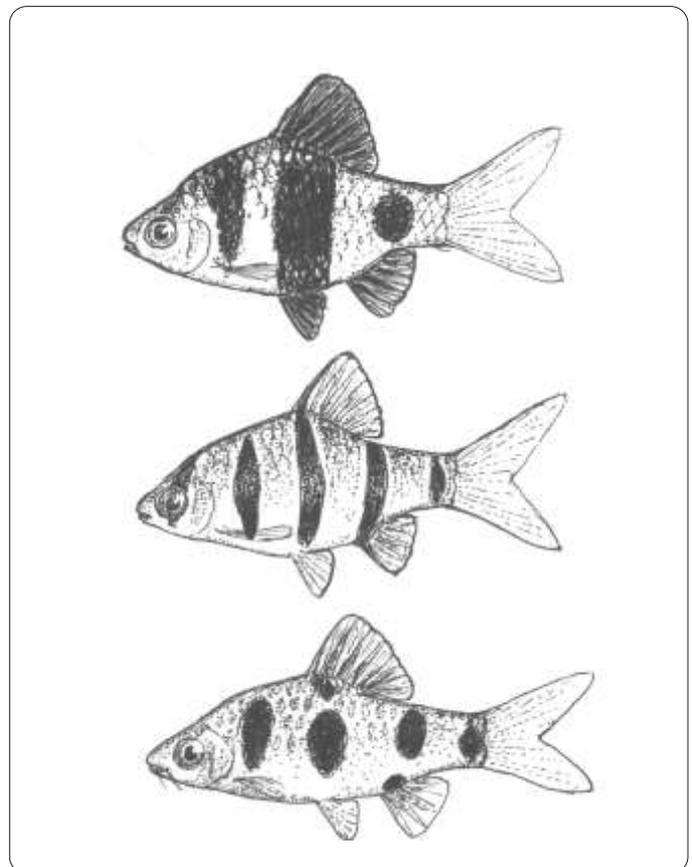
Losing biodiversity is no trivial matter, and climate change poses a significant challenge to the planet's biodiversity. Changes in the abundance of species -- especially those that influence water and nutrient dynamics, trophic interactions, or disturbance regimes -- affect the structure and functioning of ecosystems. Diversity is also functionally important, both because it increases the probability of including species that have strong ecosystem effects and because it can increase the efficiency of resource use. Species that serve similar functions in ecosystems may be sensitive to different environmental factors, thus contributing to the stability of ecosystem processes. Thus changes in climate that affect species composition and diversity are likely to profoundly alter the functioning of the biosphere and change the flow of benefits to humans from such functioning. However, our understanding of such relationships is very incomplete and many surprises may be in store.

The complexity of the issues and the momentous implications for society call for close collaboration between ecologists studying biodiversity, meteorology, climate, and policy-makers seeking to guide investments, regulations, and incentives. But such collaboration faces several challenges. First, considerable uncertainties and risks surround predictions of the implications of ecological changes. Policy options advocated may involve substantial investments that can have significant social, political, and economic consequences. Developing more reliable predictive power could help society mitigate potential negative impacts and facilitate the adaptations of ecosystems to global changes, thereby minimizing plausible damages and maximizing potential opportunities. We need better understanding of the behaviour of complex environmental systems so that we can analyze the ecological, social, and economic consequences of global climate change.

While the ecological effects of climate change on biological diversity could well be traumatic, they will only amplify the impacts that are already being imposed on natural systems by humans. As human

populations and levels of consumption of natural resources (including energy) continue to rise, so too will the impacts of humans on natural systems. Major changes in the ecological-economic-political-social feedback system can reasonably be expected to follow major changes in climate, thereby precipitating major changes in human civilization.

Climatic variation has had dramatic impacts on human societies of the past, often being implicated in the fall of ancient civilizations. Modern society, for all its technological marvels, is not immune to climatic impact. In fact, it may well be that our highly specialized society, dependent as it is on a very wide range of resources, energy, alliances, transport, and so forth, is more vulnerable to change than are local communities that control most of the main inputs to their lives. Considerable social consternation could be generated when projected shifts affect agricultural production, particularly since the cause was economic activities (i.e., CO₂ production) that directed differential costs and benefits to various groups. In essence, greenhouse gas-induced environmental changes create an issue of "redistributive justice". The social instability that is likely to follow from such social consternation means that we must generate very robust systems of resource management, able to survive the major social changes which may well arise.

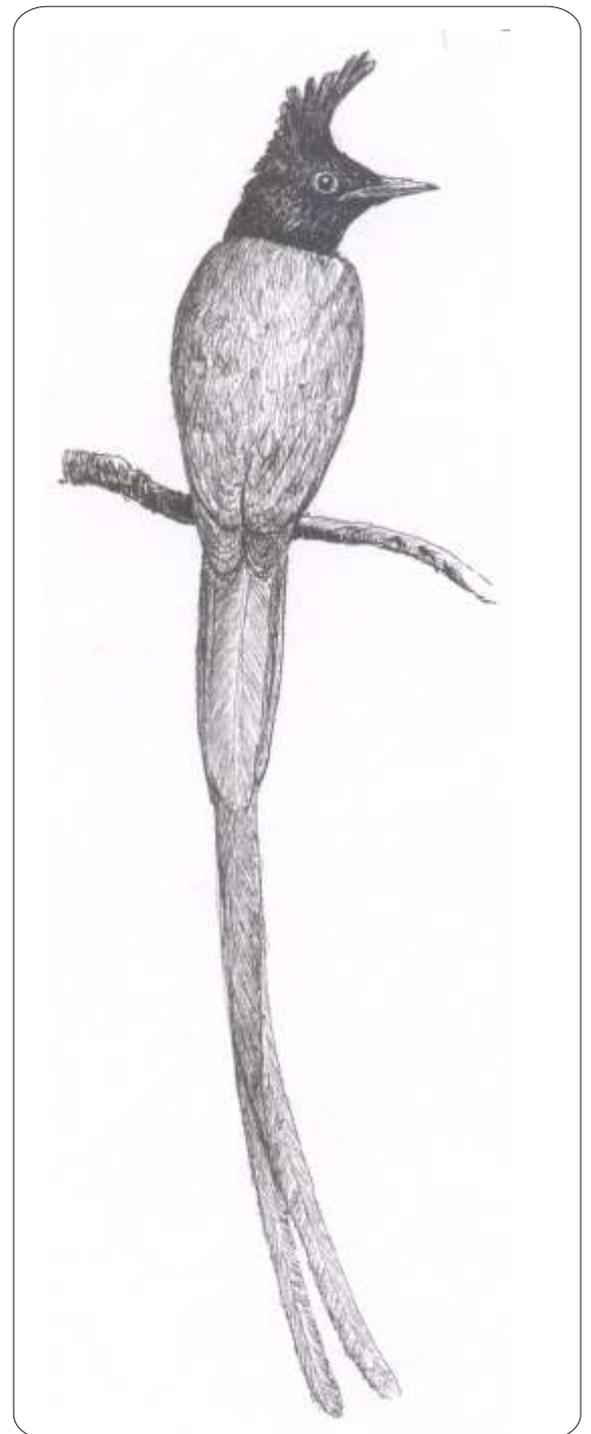


The biological changes brought about by climate change will certainly affect people directly. Changing climates that change the distribution of rainfall will also change the kinds of land use that are possible in various parts of the world, for example turning agricultural land into land more appropriate for grazing, changing the places where irrigated rice can be grown, and so forth. Such fundamental changes in food production historically have led to changes in societies, including through the impacts of famines, war, and social upheaval. While history is not an infallible predictor of the future, the social impacts of climate change are so far-reaching that they must be brought more forcefully to the attention of policy-makers.

- The overriding influences on biodiversity over the next few decades are likely to remain energy-mediated land use changes and related human impacts such as invasive alien species and pollution. The challenge posed by energy development and associated climate change needs to be addressed through thorough risk assessments. What are the appropriate responses? Here are five suggestions :
- Establish high-level joint implementation units for the Conventions on Climate Change and Biodiversity as a means of incorporating climate change considerations into biodiversity strategies and action plans, and building biodiversity concerns into planned responses to climate change.
- Ensure that all energy development projects, including alternative forms of energy, are preceded by detailed environmental impact assessments that thoroughly address potential impacts on climate change and biodiversity
- Ensure that any carbon sequestration measures are consistent with biodiversity conservation objectives and include forest conservation measures by developing countries as eligible for payments under the Kyoto Protocol's Clean Development Mechanism.
- Support a greatly increased research effort on linkages among energy, biodiversity, and climate change, including collaboration among several disciplines to understand better how the functions of ecosystems respond to climate change, and create national programmes for inventory and monitoring, as a basis for assessing status, trends, and impacts of climate change and biodiversity.

- Greatly expand the scale of areas being managed for the objectives of the Convention on Biological Diversity, using a bioregional or large ecosystem approach covering millions of hectares (often crossing international boundaries) that will enhance adaptability to changing climates.

Our current patterns of energy use are driving forces that are causing environmental degradation, including both biodiversity loss and impacts on climate change. Timely actions to address market and policy failures can facilitate implementation of both the CBD and the FCCC, and ensure that modern society can continue to develop without further losses of biodiversity.



Perspectives

Water and Climate Change: Adapting to uncertainty

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If one has to write down what we know for certain about the future impact of climate change, it would make a very fast read. Scientists say we can generally expect increasing instability of water and atmospheric cycles and more intense climate fluctuations. What are considered extreme events today are likely to be tomorrow's norm. It appears that the water crisis faced by people in many parts of the world today is destined to get even worse. We can already see many of the signs. Melting glaciers, thawing permafrost and changing rainfall patterns are causing widespread damage, as the recent floods in regions as far apart as China, Europe and Southern Africa have shown. How much change we experience depends in part on how much we reduce carbon dioxide emissions, the main culprit of climate change. This is no longer time of certainty. When even the experts are not sure of the magnitude and rate of climate change, all we can do is 'prepare to adapt' to whatever the future brings. For that we need coalitions of politicians, scientists, managers and civil society to assess risks and identify responses.

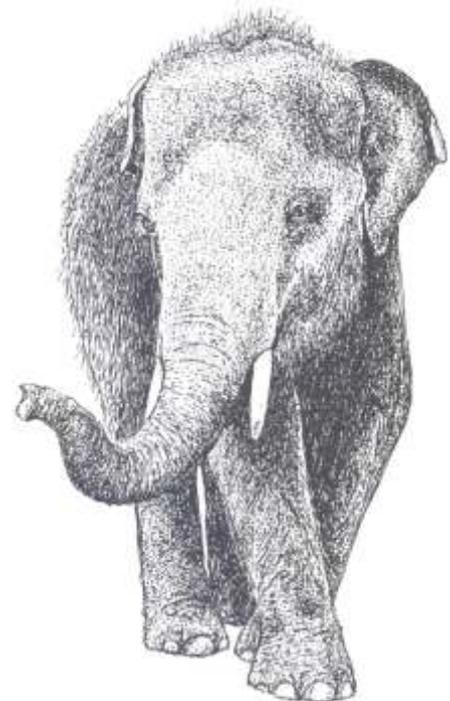
At the 3rd World Water Forum in Kyoto, Japan (March 2003), IUCN launched a report "Change: Adaptation of water resources management to climate change. Based on regional dialogues in Central America, the Mediterranean, Southeast Asia, Southern Africa, and West Africa, it highlights the actions being taken by water professionals and suggests how others can follow suit. The report makes it clear that adaptation requires much more than specialized knowledge and technology. It demands no less than a transformation of society, and the investment of effort and resources into building the adaptive capacities of people and institutions. It demands flexibility and the ability to apply innovative solutions to local situations.

Examples are within our reach, however. One is "Growing with the sea", a Dutch initiative to link

coastal defences to nature conservation. Excess water will be stored in low-lying areas to supply water for industry, agriculture and human consumption, create a habitat for important species and provide recreational opportunities. This plan combines the long-term aspects of adapting to climate change with direct, short-term benefits to society.

Another example is from Costa Rica, a country 98% dependent on hydropower and thus particularly vulnerable to changes in rainfall. The country's Electricity Institute has developed a nationwide strategy to reduce energy consumption and encourage efficiency. By means of a newspaper, radio and television campaign coupled with market incentives, the initiative encourages people to assume individual responsibility for sustainable water management.

These initiatives illustrate how water managers are finally beginning to look beyond their models and sluices and talk to the people who live with water and depend on it.



Climate Change and Sustainable Livelihoods

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The existence of anthropogenic induced climate change is now generally accepted amongst the scientific community, and is increasingly recognised as a development as well as a scientific issue. Although policy negotiations continue at international and national levels, the interface between climate change and local sustainable livelihoods is gaining increasing attention, both in terms of mitigation and adaptation activities. This requires understanding and actions to be developed at both the global (or top-down as well as local (or bottom up) levels (figure 1).

Developing countries have released proportionally less greenhouse gases, but involvement in mitigation activities may allow them to take advantage of opportunities available through the Clean Development Mechanism (CDM) under the Kyoto Protocol. This mechanism allows developed countries to take credits from CDM projects in developing nations, and also aims to assist developing countries hosting CDM projects to achieve sustainable development. Project level sustainable development is more likely to be achieved if local people are involved. For example, a monoculture forest might be an effective carbon sink, but is likely to provide fewer livelihood benefits to local people than a mixed age, mixed species forest

The impacts of climate change are unlikely to fall randomly and are likely to be most adverse for the most vulnerable regions and communities, which are (almost by definition) the poorest and have the lowest adaptive capacity regarding livelihood options. Those most likely to suffer the adverse impacts of climate change need to be provided with the necessary information for them to be able to take

Precautionary measures to deal with these impacts. Efforts must also be made to encourage local input into national policy making processes, such as preparation of National Adaptation Plans of Action (NAPA).

The policies for human, economic and environmental costs of adaptation and mitigation on sustainable livelihoods should encompass donors, experts, policy-makers and should use participatory approaches to incorporate local peoples' priorities into projects and policies to this end. Such approaches have shown that local people often have a greater sophisticated technical knowledge than anticipated. Indeed, many local communities have already developed systems, such as rapid deconstruction of their houses in times of flood, which enable them to cope better with the impacts of climate change.

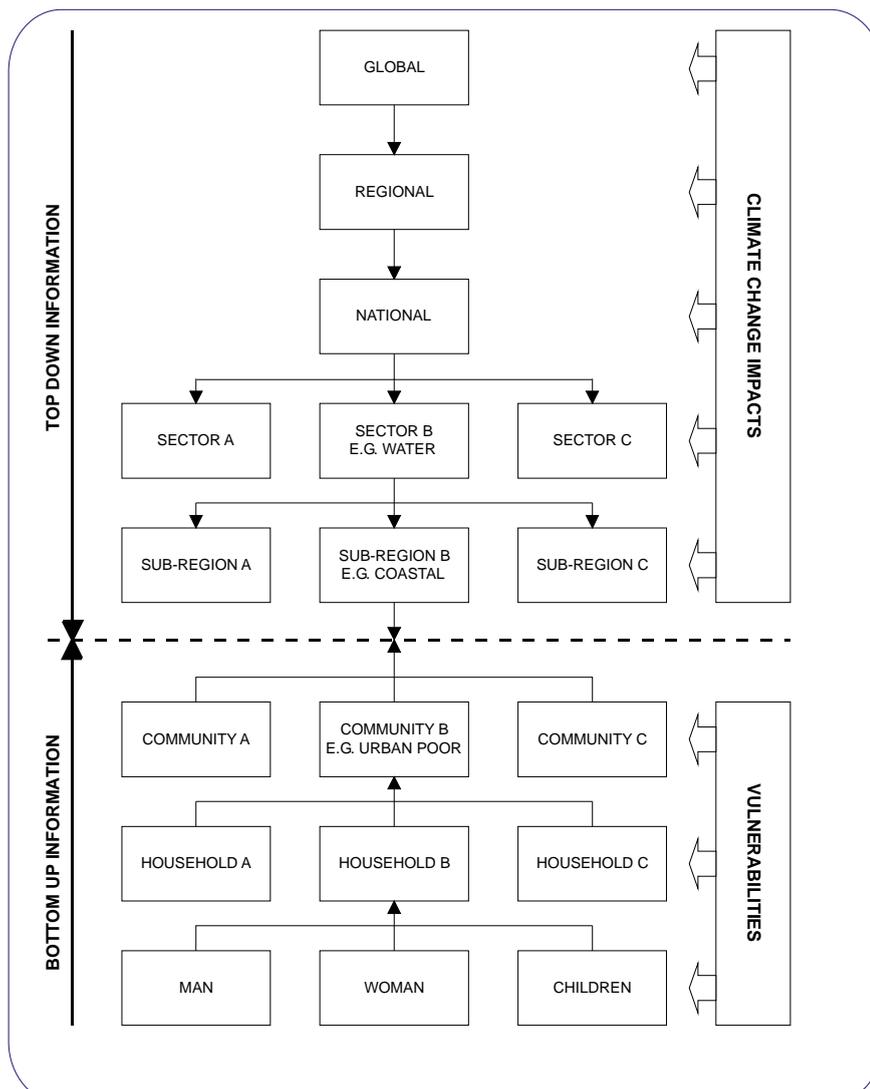
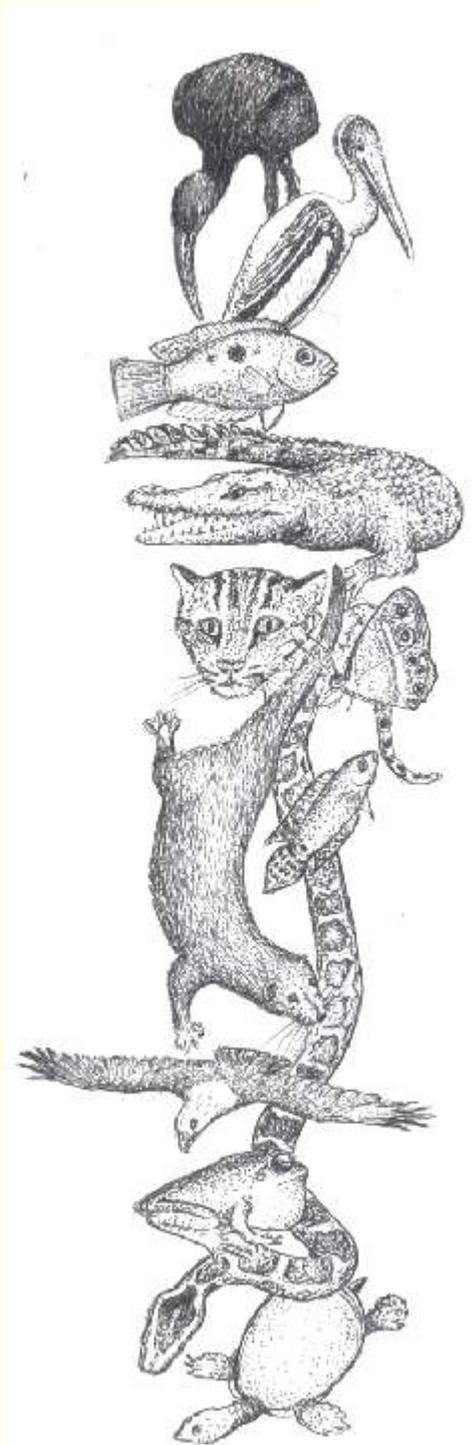


Figure 1. Assessing climate change impacts and vulnerability at different sectors and levels

Further Reading

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In Focus

Synergies between Conventions: An Assessment

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Introduction

The recently concluded World Summit on Sustainable Development (WSSD) in agreement with several national governments, international and multilateral organisations, stakeholders and communities declared specific goals with regard to sustainable development. Despite these commitments many are concerned with the lack of integrated on-the-ground work to deal with better environment. Even though Rio gave birth to three international Conventions, namely the Convention on Biological Diversity (CBD), UN Framework Convention on Climate Change (UNFCCC) and the Convention to Combat Desertification (CCD), the implementation of these Conventions are at varying stages. The Forestry Principles (FP) derived directly from the Rio Summit is often forgotten.

Each of these instruments focus on a particular set of problems, yet each also recognises that activities to address its own issues must also take into account those of the other instruments. Inter-dependency of these instruments are visible, imminent and required. Incidentally at national level all these three Conventions fall under the purview of agencies looking after environment and natural resources. Yet, these are dealt by separate departments and institutions, often with a high degree of disconnect. Such disconnects lead to ineffective implementation, though not individually at Convention level, but collectively to achieve sustainable development.

The barriers to achieve synergies are technical (lack of understanding of cross-sectoral issues, information, impact assessments etc.), political (inter-departmental conflicts, issues of 'territoriality', lack of guiding principles and understanding at policy making level) and cultural (thoughts of not overstepping boundaries and lack of insight to working at local or ground levels). In the face of these challenges there is a need to develop and enhance synergies between the instruments in terms of their implementation at local, national, regional and global levels. In some cases synergies and integrated approaches exist and can be built upon and in some cases efforts are needed to stimulate collaboration, cooperation and harmonization

Achieving Synergies

Linkages in Processes

The principles of three Conventions have elements in common. In addition they also have certain processes that are common or linked. A few of these include the following:

Scientific Linkage

Scientific assessments are key to informing the negotiation processes. These assessments include an estimate of the socio-economic implication of Climate Change, biodiversity loss, desertification and deforestation. Fundamentally, these assessments are linked when we need to interpret them for environmental protection and sustainable development. For example, the linkages between Climate Change and forests, land and biodiversity are explicit. Widespread deforestation converts forests into Carbon dioxide and reduces the vegetation cover for storing Carbon dioxide. By removing this cover, deforestation reduces the water retention capacity of the soil and increases soil erosion. This, in turn can lead to changes in temperature and topographic pattern leading to desertification and warming. Thus sustainable management of forests are needed. Deforestation also affects biodiversity in the ecosystem and in turn affects the livelihoods of local communities living in the area.

Thus, actions taken to address one element of the above can have many incremental benefits to the other. Though we understand the scientific linkages well, operational linkages at Convention levels are a bit myopic.

Implementation linkages

- The key environmental agreements also contain many similar requirements for action, research, reporting and other necessary activities agreed by their signatories.
- Approaches to goals The instruments adopt similar approaches to achieve their goals. They recognise needs for national action guided by international experiences. All of them recognise the need for capacity building, awareness raising as a pre-condition to their successes. All of them also identify need for cooperation
- Approaches to activities: All of these instruments promote activities of research, assessments, information exchange, training, development of strategies and action plans and inventories. However, the decisions of design and detail are left open for interpretation by individual governments

- **Subsidiary Bodies for Scientific and Technological Advice** All the Conventions require creation of an international body of scientific and technical expertise. CBD works through SBSTTA, UNFCCC through SBSTA and CCD through Committee on Science and Technology. However, the linkages between these bodies are weak and wanting

How to Promote Synergies and Linkages ?

It is truism that we work in a world in which governments work primarily in a sector-based mode to develop and implement their policies and programmes. We need to bring in some changes to this scenario. Suggestion or recommendation for this include the following:

- Enhancing the institutional outlook
- Building capacities both at personal and institutional levels
- Modifying National Planning processes
- Strengthening information base.

Both CBD and CCD, through Articles 18, call for the establishment of a Clearing House Mechanism to share information. However, the UNFCCC does not have such a provision. However, the IPCC fulfils the need to a limited extent. Considering the need for both technical, scientific and policy information in addition to sharing experiences, a CHM for Climate Change may be very useful. Learning from the experiences of other CHMs, it is important that the CHM on Climate Change should be designed to cater to the needs of cross-sectoral issues. Unlike the CBD, CCD, CHMs, the UNFCCC CHM can be the effort of IPCC and be supported by a consortium of agencies like UN agencies, NGOs, IGOs and others.

The establishment of a Climate Management System can also be thought of. Recent advances in ICTs with combinations of contemporary methods of education and distance learning can provide opportunities for a wide reach and use of information by rural communities in decision making.

Recent examples of Water and Climate change studies and impacts of climate change on rural livelihoods in Bangladesh clearly demonstrate the fact that it is not extreme events in Climate that will affect rural people but marginal fluctuations that imbalance their livelihood securities. ICTs provide a powerful tool for monitoring and informing local people on issues

of climate change. Experiences from several developing countries reiterate the successful use of ICT in decision making. Similar attempts to that of IPCC should be made and information provided at local level for other Conventions also.

All the three Rio Convention requires parties to develop strategies and action plans to implement the provisions and decisions of CoP. Countries also submit National Reports regularly. However, they do not require or encourage countries to address cross-convention synergies in both strategies and action plans. Several countries have already developed NBSAPs under CBD. Many of them are being revised and implementation options revisited. Given this it is critical that NBSAPs address issues of climate change and desertification. Guidelines on how to undertake this task should be developed soon.

Several LDCs are developing/required to develop NAPAs as decided by UNFCCC CoP. However, exact methods and elements of NAPA are still unclear. LDCs are particularly prone to be more impacts by climate change and might find it challenging to address issues of vulnerability and adaptation (V &A). Guidelines and specific recommendations should be provided on how to integrate biodiversity and desertification concerns into NAPAs. The planned dialogues at regional levels by UNFCCC on NAPAs must address this issue comprehensively.

It is important that policy makers and scientific community in a country understand the issues under the conventions and collectively come to conclusions on what is appropriate for them. Several countries do not have a chance to undertake such a dialogue or discussion. Provision of opportunities and platforms for such actions will be needed if we want to include the excluded.

The 'voice' of developing countries in deciding strategies and actions should therefore be enhanced through creation of opportunities for policy dialogues and implementation discussions especially prior to CoPs and SBSTAs.

Climate Change and Ecosystems

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Climate change is the most significant, far-reaching and globally pervasive environmental threat humanity is facing today. The repercussions of climate change on ecosystems are likely to be considerable, yet they have received little attention so far. Natural ecosystems are likely to be less adaptable than human systems to climate change, being already constrained by burgeoning population pressure and agricultural land-uses, in addition to threats from other developmental activities. Climate change is rarely factored into considerations about the future of threatened and endangered species. For instance, the Golden Toad in Costa Rica's cloud forest may be the first species driven to extinction by climate change, although the full explanation remains unclear. Similarly, Mosquitoes in the United States are hibernating later as winters get warmer. This could be the first genetic adaptation to global warming to be identified. At the same time many species that are currently not endangered face an uncertain future as habitats shrink, shift, change and degrade.

Ecosystems, together with their myriad plant, animal and microbial species, are complex systems whose structure and function are intimately influenced by climatic regimes. Responses to climate change

involve patterns and processes over a wide range of temporal and spatial scales, from the nearly instantaneous physiological responses of individual organisms, to shifts in species distributions from one year to the other, to large-scale shifts in biomes over decades and centuries, and to shifts in the genetic makeup of populations over millennia. As yet, our understanding of the role of climate in ecosystems, or for that matter in the biology of individual species, is incomplete, and our ability to predict future responses is neonatal. Much work remains to be done in furthering the science of climate change assessment, in developing realistic dynamic models, in understanding interactions of species with their environment and with each other, in amassing baseline data on species distributions, and in making baseline and climate change scenario data sets widely available within the scientific community. Impact assessment in the biodiversity sector has broad scope. Techniques are available at several levels of biological organisation, including populations, species, communities, ecosystems, and biomes. Depending on the resources available, many techniques may be used within each level, from simple screening based on data in the literature, to the collation of expert judgements, to statistical descriptions of existing climate relationships, and to the creation of dynamic simulation models. Most of these techniques are undergoing active development, and steady improvement is expected in the years to come.

Table 1. Examples of some ecosystem types sensitive to climatic change

Ecosystem/Biome	Key Climate Sensitivities
Alpine/Montane ecosystems	Temperature, precipitation
Arctic ecosystems	Temperature
Boreal forest	Temperature, fire regime, soil moisture
Coastal wetlands	Sea level rise, storm surges
Coral reefs	Sea surface temperature, storms
Island ecosystems	Sea level rise, temperature, Storms
Mangrove forest	Sea level rise, storm surges
Tropical forest	Drought, floods, fire regime, seasonality, hurricanes

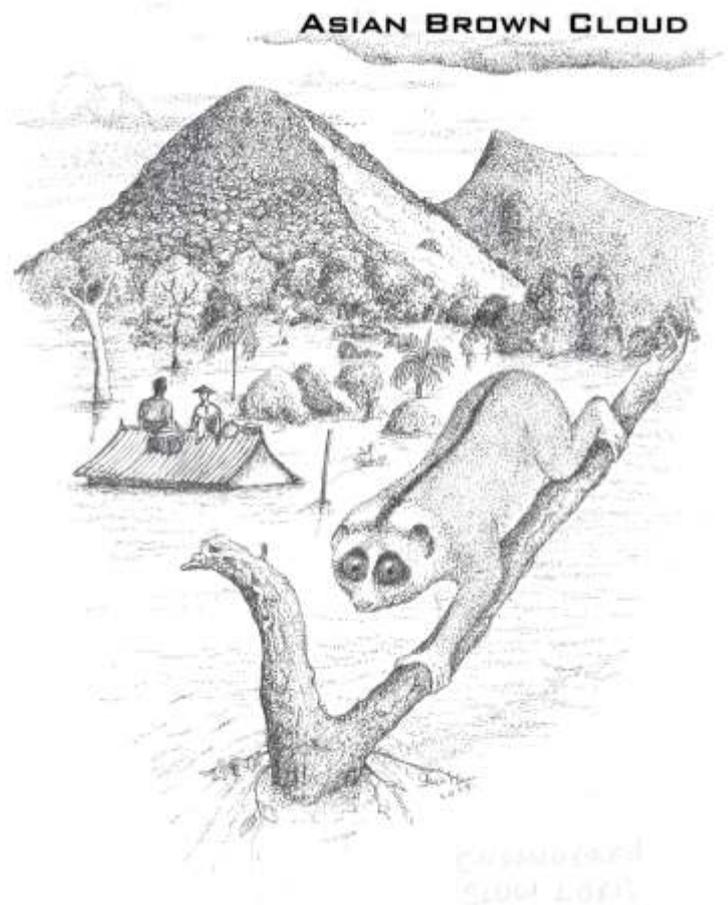
Even more rudimentary than our understanding of the role of climate in natural ecosystems, is our ability to sustainably manage them. Natural ecosystems are much more complex than human systems, and possibilities for emergent and unexpected behaviour are manifest. Our history of interactions with natural systems provides many more examples of mismanagement than with success. The primary goal of adaptation in the biodiversity sector is to ensure that natural systems are able to respond to climate change to the limits of their capabilities. An effective strategy for achieving this is to reduce or remove existing pressures. Many of the same principles that are currently used to minimise negative impacts of development on natural systems find direct application in avoiding the potential negative impacts of climate change, such as the designation of interconnected and comprehensive reserve networks, and the development of ecologically-benign production systems. A significant challenge is to incorporate biodiversity thinking into adaptive responses in other sectors, to ensure that future development activities do not further jeopardise the world's non-renewable biological resources.

Recent studies across the globe demonstrate that rapid rates of global warming are likely to increase rates of habitat loss and species extinction, most markedly in the higher latitudes of the Northern Hemisphere (Table 1). Further, extensive areas of habitat may be lost to global warming and many species may be unable to shift their ranges fast enough to keep up with global warming. Rare and pocketed populations of species in fragmented habitats such as those surrounded by large water bodies, human habitation and agriculture are particularly at risk, as are montane and arctic species.

Mitigation options are being explored to minimise long-term impacts of human-induced greenhouse gases on the Earth's climate, whilst a wide range of 'sectors' are considering how they might adapt to the inevitable effects of climate change in the shorter term. There is already clear evidence to show that ecosystems from the poles to the tropics in both hemispheres are being affected by climate change. Species migrations, extinctions and changes in

populations, range, and seasonal and reproductive behaviour are among a plethora of responses that have been recorded. The pace of these changes is expected to increase in decades to come. As the potential responses of natural systems to human-induced climate change are inherently limited, the ideal strategy is to minimise the amount of change itself. However, as climate change is an inevitable process, the following mitigatory and adaptive measures are suggested to help circumvent adverse impacts on ecosystems, species and on the sustainable livelihoods of communities that are dependent on them

- Encourage pro-poor and community-based natural resource management to minimise adverse effects of climate change
- Improve available information about climate impacts on ecosystems for informed decision making
- Integrate adaptation activities within mainstream planning frameworks
- Integrate climate adaptation into national, sub-national and sectoral planning processes
- Promote insurance against climate change impacts
- Enhance international financing of adaptation within the budget process of developing countries
- Strengthen the role of development agencies in supporting adaptation



Clean Development Mechanism and Sustainable Development

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An important outcome of COP-8 was to make the Kyoto Protocol's Clean Development Mechanism (CDM) fully operational. The decision also adopted the simplified modalities and procedures for small-scale CDM project activities. Of the three flexibility mechanisms in the Kyoto Protocol designed to engage the market place in meeting the commitments of the developed countries, CDM under Article 12 of the Kyoto Protocol is the sole mechanism that involves developing countries. While public and private entities are eligible, the CDM is likely to be private sector driven, due to the fact that the CDM is a market-based mechanism and will be run like a business. Participation in a CDM project activity is voluntary and CDM investments will be market driven. CDM activities must lead to reductions in emissions, which will be transferable to the investor in the form of Certified Emission Reductions (CERs). Contributions to sustainable development in the host country are a primary product of CDM projects. The definition of sustainable development or how CDM projects should contribute to it is considered the host country's prerogative.

CDM promises additional resources for investment in renewable energy, energy efficiency and other projects which reduce greenhouse gas emissions in the South. Although CDM will not solve all development problems of host countries, it can potentially influence investments, technology and economic growth in the country. However, like other foreign investment, the frequency and success of CDM projects in developing countries will be influenced by their ability to present viable projects and ensure that all transactions including those promoting sustainable development proceed efficiently. The Non-Annex I (NAI) countries significantly differ in terms of national capacities to utilize technology, access finance and efficiently implement CDM activities.

Although, the CDM is an innovative instrument, it is relatively complex. The knowledge base to make CDM viable is rapidly growing and serious efforts are being made by the CDM Executive Board to make the final architecture coherent and efficient. There appears to be a high demand from the developing countries for initiating a CDM transaction. Its success however will be guided by clearly defined sustainable development priorities that are complemented by transparent, stable, participatory and efficiently administered governance regimes policies, laws and regulations in the country.

Simultaneously, CDM strategy must be examined from a long-term equity perspective, viz., how these projects can create capacity for implementation of mitigation activities and.

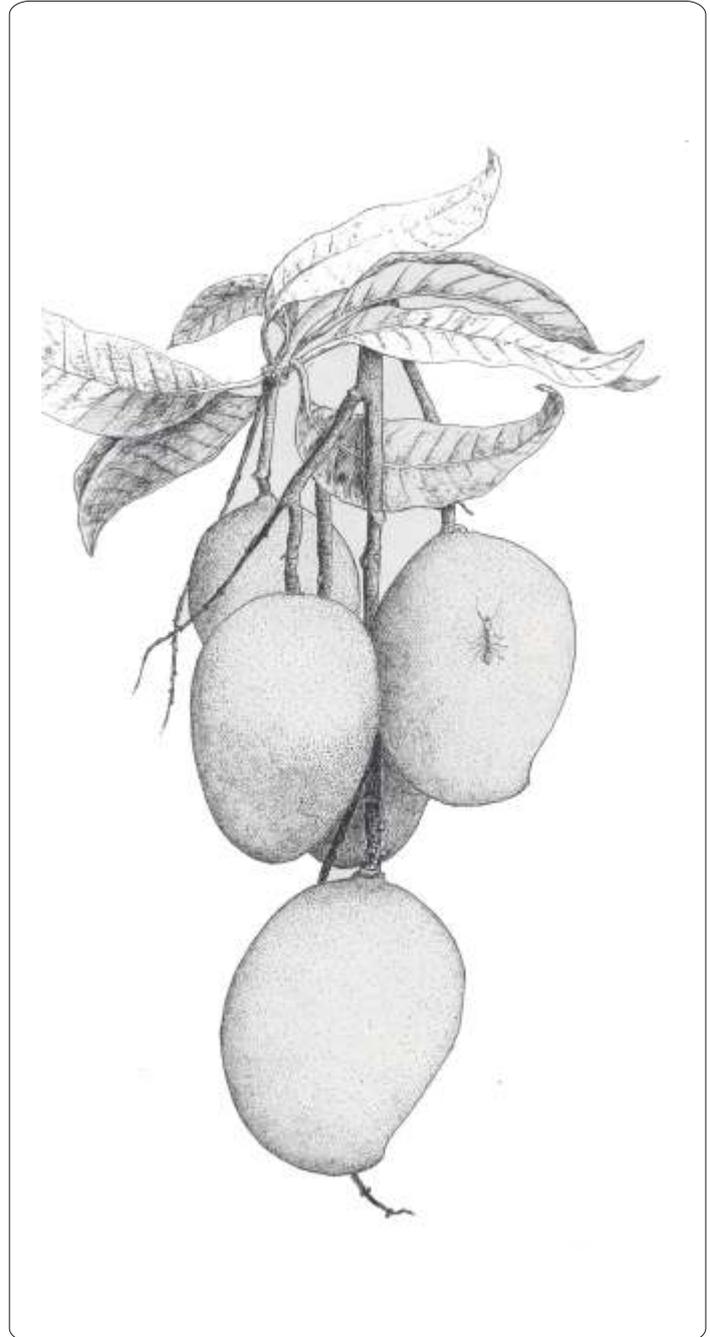


Enhancing the range of win-win options of sustainable development that result in a high-growth, low-carbon trajectory within the financial, institutional, and technological reach of host countries. Strengthening broad based capacity in developing countries that fully integrates equity concerns into the CDM will enable them to undertake future emissions reductions of the magnitude eventually required globally if we have to combat climate change while maintaining sustainable development. The key to this is long-term thinking

Until the carbon market evolves sufficiently, the private sector is likely to focus on “straightforward” projects that are commercially viable with the resulting Certified Emissions Reductions (CERs) providing an incremental benefit. UNDP's experience from the country level CDM activities is that, while a high internal rate of return is necessary, it is not a sufficient condition for attracting private sector investment. Even though a number of projects analyzed by UNDP in cooperation with host countries had a significantly high internal rate of return, investors did not take them up. Non-economic project barriers consisting of inadequate policies, institutions, legal framework, and lack of innovative and development oriented financial institutions, and human capacity were a major constraint to attracting foreign investment.

Similarly, learning from the pilot phase of Activities Implemented Jointly (AIJ) highlights the critical importance of adequate human, institutional and systemic capacity, enabling environment and information for its success. AIJ projects concentrated in countries and regions that had targeted policies, adequate capacity to undertake and implement projects, and transparent regulations and institutions that encouraged stakeholders' participation. Also learning by doing capacity development efforts were found to be effective in the success of the projects undertaken.

Low and fragmented skill levels in developing countries constrain internal responses to climate change challenges within the framework of sustainable development. In order for the host countries to fully embrace CDM as an integral tool for sustainable development, they must be empowered to be equal partners in negotiations with the developed countries and private sector. A critical element of the solution lies in capacity development and institutional strengthening to address limitations in the CDM implementation and governance regimes resulting from weak administrative



structures. This in turn would lead to transparency, efficiently administered policies, laws and regulations, accountability and participation of diverse stakeholders.

UNDP's country level activities also emphasize that in the absence of effective host country capacity to competently address issues relating to project approval, coherently articulated national, sectoral and technological priorities and transparently defined sustainable development criteria, CDM processes will incur prohibitive transaction costs. These issues constitute, *inter alia*, the primary responsibility of the host country's designated national authority (DNA) in accordance with the participation requirements under CDM rules.

Country & Regional Round-up

Dialogue on Water and Climate in the Mekong Region

IUCN-Regional Water & Wetlands Programme,
Bangkok

Currently and in the future, wetlands and water resources are being and will be affected by pressures from global change such as climate change, sea level rise, pollution (including acid rain), and land use or land cover change. Successes in wetland conservation and the continued viability of associated livelihoods will need to be measured against the potential impacts of these pressures. Water-based ecosystems are already undergoing changes due to increased climate variability and these changes are likely to increase in the light of future climate change. In the lower Mekong Region where communities and economies are heavily reliant on water and wetlands based livelihoods and commercial production, these changes are likely to have significant social impacts.

The Dialogue on Water and Climate project aims to assess the vulnerability of rural people who are reliant on water and wetland resources to climate change. In addition, it will produce information and enhance capacity to facilitate autonomous coping as well as to develop adaptation frameworks that will guide national and regional government policy makers and civil society. The major objectives of this project are

- To strengthen the capacity of governments, NGOs, the private sector and community organizations to evaluate the costs and benefits of climate change adaptation (development of a framework for action).
- To analyze the resilience of wetlands and water resources and associated livelihoods to climate change and identify hot spots of vulnerability.
- To identify and evaluate climate change adaptation options, especially natural resource-based approaches and the main barriers to implementation. These approaches should provide multiple benefits. They should, when possible, generate immediate economic returns to poor people, sustain and diversify their livelihoods, conserve ecosystems and where possible sequester carbon.
- To assist countries in a more integrated approach to the World Water Forum, the UNFCCC and the RAMSAR Convention on Wetlands

The Dialogue on Water and Climate in the Mekong region is coordinated out of the IUCN Asia Regional Office and the initial workshop was held in November 2002. IUCN commissioned a paper on Climate Change scenarios and anticipated effects on water and wetland resources in the Mekong region from UNEP Southeast Asia START Regional Center. IUCN held a workshop to disseminate the information and solicit input for preparedness and action. The workshop provided valuable feedback related to the current understanding of climate change adaptation in the region among various stakeholders. One of the important points that emerged from the workshop was a lack of understanding and the inability to conceptualize actual development and livelihood impacts of climate change-induced changes in water and wetland resources. The subsequent initiatives will attempt to address these shortcomings and develop comprehensive and practical directions for adaptation in the Mekong.

In this context the following activities will be initiated

Collection of secondary information and formulation of assessment methodologies.

In order to assess the vulnerability through participatory research, baseline information on hydrology, precipitation, extreme climatic events and socio economics will be useful for corroboration. It is likely that the information will be sparse, but will nevertheless be valuable in setting the scenario for the field-based participatory research. There are a number of vulnerability assessment methodologies currently in use for a variety of purposes. These methodologies provide a solid basis to develop an assessment methodology in the context of climate change and water and wetland resources in a rural setting in developing Southeast Asia countries.

Local Level Dialogues and Participatory Vulnerability Assessment

Local level dialogues and participatory vulnerability assessments will be carried in the four demonstration sites of the IUCN/UNDP/MRC Lower Mekong Biodiversity Conservation and Sustainable Use Program. The exercise will seek to identify current and future vulnerabilities of people and their adaptive capacities.

The assessment will attempt to identify vulnerabilities in the context of changes in the environment as in changes in flooding patterns, changes in seasonal flow patterns, changes in natural resources management methods, political changes affecting the use of water and wetland resources, fishing methods, farming methods, settlement areas

etc. This will give us a good understanding of which livelihood methods associated with water and wetland resources are most vulnerable, why, how and when they are vulnerable and how people dependent on these livelihood methods will cope. Then, using climate modeling information, current vulnerability will be linked to the future and it will enable us to assess the drivers of vulnerability.

The vulnerability assessment will consist of the following steps leading to an adaptation framework:

1. Climate change modeling
2. Hydrological and ecological impacts
3. Relating livelihoods to their exposure to risks: current vulnerability
4. Description of coping strategies for the identified livelihoods
5. Drivers of vulnerability: linking the present and future

National Dialogues

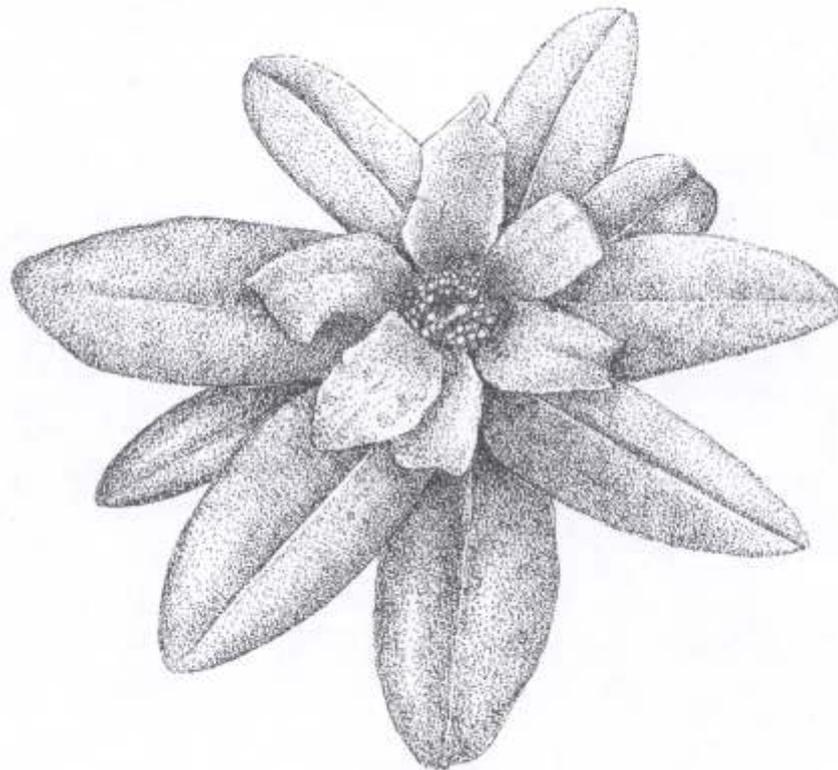
The output of these four local level dialogues will feed into four national dialogues. The participants at these dialogues will mostly consist of national government representatives, academics, private sector and NGOs and other organizations active at the national level. The focus of these meetings will be to promote the incorporation of climate change

induced changes in water and wetland resources into the national sustainable development agendas. This will focus on how to incorporate the potential impact of these changes into their long-term strategic planning processes. The outcome of these dialogues will:

a. Assist national policy makers in incorporating these possible changes into their long-term strategic planning processes in the agricultural, industrial, water management, disaster management and other relevant sectors. Using available information guidelines and indicators will be formulated to assess the vulnerability of communities to climate change. The outcome will enable decision makers to use climate information and the indicators to efficiently assess the vulnerability of people, livelihoods and their environment.

b. Assist national policy makers to prepare National Adaptation Programmes of Action under the UNFCCC mandates.

c. Provide IUCN and development organizations with information on capacity building needs and necessary interventions for climate change adaptation-related to water and wetland resources.



Mainstreaming Biodiversity and Climate Change-Asia Regional Workshop Report

Bhujang Dharmaji
Regional Biodiversity Programme, Asia

Rationale and Objective

As a plan of action to implement capacity building and get the thinking process on synergies between conventions rolling, IUCN-RBP in partnership with UNDP and Ministry of Environment and Forests, Government of India organised a Regional Workshop targeting biodiversity and climate change focal points of Asia on Mainstreaming Biodiversity and Climate Change between 06-11 April, 2003 in Wildlife Institute of India, Dehradun, India.

The workshop agenda was developed after detailed consultations in the region as well as with the Secretariats to the Conventions. The focus of the workshop was to achieve awareness raising, knowledge creation, developing policy inputs and information dissemination activities. The structure of the workshop was designed to be interactive, encouraging discussions between the resource person and participants during all sessions. To enhance teamwork and address issues of synergies more critically, two working groups were created based on participant interest and field of expertise during the initial group discussions.

About 40 participants from 12 countries participated. They comprised of senior policy makers, academics, non governmental organizations, development institutions, financial institutions and representatives from the various Convention Secretariats such as UNFCCC attended this workshop.



The workshop addressed the linkages between these cross-sectoral areas through identification of current practices used by countries for effective integration, as well as through exploration of areas where further attention is needed to stimulate collaboration, cooperation and harmonization. More specifically, the workshop investigated modalities of three conventions addressing biodiversity and climate change relate to one another (i.e. the Convention on Biological Diversity - CBD, the UN Framework Convention on Climate Change - UNFCCC, and the UN Convention to Combat Desertification- UNCCD), and how synergies among these conventions can be realised during implementation at the local, national and regional levels.

-Impact and Achievement

The workshop was considered as a milestone event in that it was the first time that CBD and UNFCCC national focal points from Asia came together to discuss mainstreaming climate change into biodiversity, biodiversity into MDGs, climate change into MDGs and prioritizing actions at national and regional scale for implementing the conventions on biological diversity, desertification and climate change at the country level. This was accomplished through a sharing of country experiences linking CBD, CCD and UNFCCC, country prioritization of possible actions and interventions, and development of two sets of recommendations on means of encouraging synergies, as well as linkages with the MDGs. The workshop was also seen as an opportunity to contribute to capacity development of national actions on synergies and create new channels for exchanging practices, views and options. Through the presentation on MDGs and WEHAB and the related discussion, participants were able to identify areas where climate change and biodiversity have the potential to impact on the achievement of MDGs, not only in goal seven (related to environmental sustainability), but across a number of other MDGs. This aided in facilitating cross-sectoral thinking and situating these two areas in the broader development discourse, particularly related to poverty reduction.

The way forward

The participants from the region were encouraged to submit a half page note on their country experiences, presenting case studies on recently completed projects. The resource persons of the workshop who shared their experience through lecture sessions, have been requested to contribute a full paper highlighting elements of mainstreaming biodiversity and climate change. A full set of proceedings will be

published before UNFCCC CoP 9. It is expected that the outcomes of this workshop will contribute, or have contributed to the following events related to the three Conventions-

UNFCCC

- SBSTA-18 and SBI-18 in Bonn during June 2003.
- Workshop on Synergies in Finland during July 2003
- LDC expert group and NAPA meetings in Bhutan during September 2003
- CoP-9 in Milan during December 2003

UNCCD

- Conference of Parties (CoP-6) to be held in Havana, Cuba during August 2003.

CBD

- SBSTA-9 in Montreal during November 2003
- CoP-8 in Montreal during March 2004

In addition, the outputs from this workshop would also feed into the process of SCBD and UNEP meeting on 'Achieving the 2010 Targets' to be held in London during May 2003.

The preparation of scientific guidance for the integration of biodiversity considerations in the implementation of the UNFCCC requires an understanding of the relevant provisions of the instrument, and actions taken to implement it. Based on the lessons learned from this activity and the feedback from the national focal points of CBD and UNFCCC in the Asia region, IUCN-RBP, Asia has initiated a pilot phase of activity to demonstrate country level implementation of synergies between conventions. As RBP is already working with countries like Lao PDR and Bangladesh in preparation of NBSAPs, incorporating climate change consideration into NBSAPs along with facilitation for development of NAPA in these two LDCs would be good case studies to demonstrate how synergies can work at the ground level.

It is also intended that the findings of this activity be broadly disseminated to raise the voice of Asia in key intergovernmental discussions and to replicate the methodology in other parts of Asia incorporating 'lessons learnt'. Efforts have also been made to partner with other like-minded institutions (eg. IISD), to take forward this initiative for a larger climate Change change portfolio.

Impacts of Climate Change on Wildlife of Bangladesh

Farida Shahnaz
IUCN-Bangladesh

Bangladesh, with a population nearing 130 million, is one of the least developed countries (LDC) in the world while also being one of the most vulnerable to the impacts of climate change. The climate change impacts range from an overall increase in sea level, atmospheric temperature, and rainfall to more intense natural disasters in the form of floods, cyclones, storm surges and drought.

Although Bangladesh is a small country, there are considerable regional variations in topographical factors such as coastal, floodplain, hoar, Barind tract (arid and semi arid area) and hills. For example, vulnerabilities to drought conditions are the greatest in the northwest region, whilst vulnerability to 'cyclone impacts are greatest in the areas

immediately bordering the coast). Low-lying coastal areas or adjacent to river deltas, estuaries that may be vulnerable to sea level rise and associated backwater flooding. They will face the most immediate consequences of climate change. The major impacts of climate change on the Biodiversity of Bangladesh includes loss of:

- Feeding and breeding ground of terrestrial mammalian fauna (Cats & Ungulates) in Sundarbans
- Habitats of Inter tidal beach fauna in southeast coast
- Extent of occurrence in nesting and feeding grounds of Marine Turtles and Migratory shorebirds
- Staging ground of migratory waders

A brief assessment of the impact of climate change and variability on faunal biodiversity in five distinct geographical zones within Bangladesh has been included below

Cause	Coast	Flood Plain	Barind Tract	Madhupur Tract	Haor Basin	Hills
Storm and Tidal Surge	Marine Invertebrates Corals, Mollusks High wave and unusual velocity dislocate aquatic life	Pollinators Impact on phenology in the form of physical damage	Birds Breeding Nest destruction	Arboreal wildlife Impact on feeding and nesting	Reedland Wildlife	Arboreal wildlife Impact on feeding and nesting
Flood and Drought	Impact of feeing and breeding grounds Narrow niche species Shorebird (mudflat, sand, beach dwellers) Brackish water species	Terretrial Fauna Fussorial (Annelids) Reptiles (snakes) Land dwelling mammals Cat fish production increased	Extent of occurrence would be reduced Less water h ole + High predation in small area of occupancy	High impact on ground dwellers Burrowing animals and shoot eaters would be impacted negatively	Extreme fluctuation impact on vegetation pattern and hydrology Reduced area of occupancy and over predation	Conflict with the usual cycle of wildlife Earlier or prolonged breeding cycle
Sea Level Rise	Estuary/Brackish water ecosystem would be shrunken Brackish water -based faunal diversity would be reduced	Invasion by Salt tolerant species Complex food chain	No pronou nced impact	No pronounced impact	Change in normal pattern of back water effect Possible invasion of species	No pronounce d impact

Bangladesh is very rich in herpetofauna which shares a major portion of the species found in South Asia. A total of about 148 species have so far been recorded from the country and additional species is believed to be found. The expected number thus to be around 160 species and so on. Out of 148 species 71 species are nationally threatened. The biggest threats to herpetofauna are the habitat loss/degradation. Climate change such as prolonged drought, cyclones/surges and salinity raise some times impacts heavily on the amphibian's population.

- Green frogs are among one of the threatened herpetofauna. Amphibians are indicators aquatic ecosystems and its associated floral and faunal state; they serve as bio-indicators for determining the quality of the environment. Green frogs are the indicators of presence fresh water ecosystem within a salt/ brackish water environment. They are the indicators of freshwater ecological balance, presence of aquatic vegetation and aquatic invertebrates. They are also indicators of micro-climatic condition and season
- Lizards are carnivorous, some of them are insectivorous. Monitor lizards take snakes as their feed. Commercially lizard skin is a valuable export item for the leather industry.
- Turtles are scavengers and keep water quality in balance. Some turtles are indicators of estuarine water quality (*Batagur baska*).
- Snakes are very vital component of wildlife biodiversity as they are genuine poikilothermal animals indicated the fluctuations of temperature and rainfall in an ecosystem. They are good controller of rodents and one of the main sources of nature tourism.
- This group of wildlife with special reference to crocodiles and snakes having very much close linkage with the culture and religions of the region.
- Marine Turtles are indicators of marine ecosystems. Nesting female is the indicator of sandy beach/sand bar and dune. Their breeding cycle is the indicators of rainfall. Marine turtle conservation programme was initiated in the Sunderbans from the year 1999. The nests are identified and protected by making fence. Regular patrolling is carried out to identify the nests. Nests are monitored regularly and eventually hatchlings are released in water. Awareness campaign is conducted in Dubla about the Marine turtle among the fishermen. Dead turtles are recorded in Register. Staffs were trained up on the turtle conservation. Mandarbaria coast of Sunderbans is the breeding ground of Olive Ridley turtles.

Sundarbans- The threatened mangroves

The Sundarbans of Bangladesh, which support a diversity of wildlife, are at great risk from rising sea level. These coastal mangrove forests provide habitat for species such as Bengal tigers, Indian otters, spotted deer, wild boars, estuarine crocodiles, fiddler crabs, mud crabs, three marine lizard species, and five marine turtle species (Green, 1990). With a 1-m rise in sea level, the Sundarbans are likely to disappear, which may spell the demise of the tiger and other wildlife. The Sundarbans forest, the home of many endemic species including the Royal Bengal Tiger, will be severely affected under climate change. A total of about 11 species of globally threatened herpetofauna is found in Sundarbans. These are Batagur, Peacock Soft-shell, Ganges Soft-shell, Narrow-headed Soft-shell, Black Pond Turtle, Yellow turtle Loggerhead, Green turtle, Olive Ridley, Hawksbill turtle and Asiatic Rock Python.

The mangrove forest depends largely on the freshwater supply along the Ganges system. Under climate change induced aggravated low-flow conditions, the Gorai system might not be able to supply adequate quantum of freshwater. The problem is likely to be compounded by withdrawal of surface flows in the upstream areas to offset increasing moisture stress. In such a scenario, salinity is likely to penetrate inland and the salinity regime, on which the succession process of the vegetation of the forest depends, will be disturbed, leading to a gradual decline in the forest vegetation. It is prognosticated that, poor quality shrubs will dominate with increasing salinity and high-value timber species will gradually disappear.

It has been projected that the sea level relative to Bangladesh coastline will rise about 45 cm by the year 2050 due to global warming. This will threaten the Sundarban Mangroves. If both freshwater zone and the moderate saltwater zone of the Sundarban Mangroves turn to become saltwater zone then the whole mangrove is likely to hold only those types of species, which now exist, in the saltwater zone. It means the saltwater ecosystem will swallow the other 2 ecosystems causing enormous damage to stocks and productivity of the forest as well as irreparable loss to the rich ecosystems and bio-diversity. Efforts to mitigate such a national crises will be limited not only by resource constraints but also by the availability of much required increased fresh water flow through the rivers and canals of the Sundarban freshwater zone.

Events

IUCN Events

GBF prior to Sixth Session of the Conference of Parties to the UNCCD

30-31 Aug 2003
Havana, Cuba
Contact: Caroline Martinet
Email: ccm@hq.iucn.org

GBF Prior to WTO Ministerial Meeting

5-7 Sep 2003
Cancun, Mexico
Contact: Caroline Martinet
Email: ccm@hq.iucn.org

World Park Congress

Durban, South Africa
7-18 September
Contact: Kishore Rao
E mail: parks-asia@hn.vnn.vn

Environmental Law Training Programme

24-28 November
Singapore
Contact: Balakrishna Pisupati
Email: pbala@sltnet.lk

IUCN-Regional Conservation Forum

9-12 December 2003
Colombo, Sri Lanka
Contact: Zakir Hussain
Email: hussain@iucnt.org

Global Biodiversity Forum-South East Asia

January 2004
Indonesia
IUCN-RBP, Asia
Contact: Balakrishna Pisupati
Email: pbala@sltnet.lk

Other Events

Sixth Session of the Conference of Parties to the UNCCD

25 Aug- 5 Sep 2003
Havana, Cuba
Contact: <http://www.unccd.int/main.php>

Workshop on Implementation of NAPAs

8-12 Sep 2003
Bhutan
Contact: <http://www.unfccc.int>

Ninth Meeting of the Subsidiary Body On Scientific, Technical and Technological Advice (SBSTTA-9) - CBD

10-14 Nov 2003
Montreal, Canada
Contact: <http://www.biodiv.org>

19th Sessions of the Subsidiary Bodies UNFCCC

1-12 December
Milan, Italy
Contact: <http://unfccc.int>

Conference of Parties at its Ninth Session (CoP 9) UNFCCC

1-12 Dec 2003
Milan, Italy
Contact: <http://unfccc.int>

Second meeting of the Ad Hoc Open-ended Working Group on Access and Benefit-Sharing

1 - 5 December 2003
Montreal, Canada,

Conference of the Parties to the Convention on Biological Diversity (COP 7)

9-20th February 2004
Kuala Lumpur, Malaysia

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