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Cover photo: Leaf litter collection, Nepal,
Matthew Chadwick



A farmer in her new vegetable garden in Mustang, Nepal

Photo: M. Chetri

Small island developing states

Kanayathu Koshy and Sarah Granich discuss an international review of the Barbados Programme of Action on Small Island Developing States

The International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States took place in Port Louis, Mauritius, 10-14th January 2005.

About 2000 participants, including 18 presidents, vice-presidents, prime ministers, roughly 60 ministers and representatives of United Nations (UN) agencies, journalists from 114 countries and intergovernmental and non-governmental organizations participated in the meetings.

The International Meeting was preceded by two days of informal consultations on 8-9th January to facilitate preparations for the International Meeting, in particular, to advance negotiations on the Strategy for the Further Implementation of the Barbados Programme of Action. The Main Committee for negotiations met from 10-13th January.

Between 10-12th January, the International Meeting held five plenary panels on the themes of: environmental vulnerabilities of Small Island Developing States (SIDS), special challenges of SIDS in trade and economic development, the role of culture in the sustainable development of SIDS, addressing emerging trends and social challenges for

the sustainable development of SIDS, and building resilience in SIDS.

During the final two days, the high-level segment of the International Meeting met to debate the "Comprehensive Review of the Implementation of the Programme of Action for the Sustainable Development of SIDS", and to hold round tables on "The Way Forward", with emphasis on resource mobilization and capacity building. There were many side events and partnership activities focusing on the role of youth, civil societies, community groups, UN bodies and donor agencies.

By the end of the International Meeting, the delegates had adopted the Mauritius Declaration and the Mauritius Strategy for the Further Implementation of the BPOA as the major outcomes.

Though the Mauritius Declaration did compromise on a number of issues, all delegates agreed that they were, overall, highly satisfied with the result. In particular, there

MAIN POINTS

- **The authors** discuss the outcome of the International Meeting to review the Barbados Programme of Action (BPOA) concerning the sustainable development of small islands states.

- **Progress in implementing the BPOA** has been disappoint-

ing and new issues, such as trade, globalization, information technologies and HIV/AIDS, have emerged that warrant urgent action.

- **The meeting resulted in** international recognition of the particular vulnerability of small island states.

was agreement that SIDS should be treated as a “special case” in regards to sustainable development and a commitment to full implementation of the UN Framework Convention on Climate Change and further promotion of international cooperation on global warming.

The document that formed the basis for negotiations at Mauritius was a synthesis product of the Alliance of Small Island States’ Strategy Paper from the Inter-regional SIDS Preparatory Meeting in Nassau, the Bahamas, 26-30th January 2004. This text was further considered by the International Preparatory Meeting, 14-16th April 2004, at the UN headquarters in New York, during the 12th Session of the Commission on Sustainable Development and by informal meetings at

port and communication, science and technology, sustainable capacity development and education for sustainable development, sustainable production and consumption, health, knowledge management and information for decision-making, culture, coastal and marine resources, land resources and graduation from LDC status.

Climate change, trade and waste remained thorny issues for the negotiating groups. During the negotiations, Tuvalu expressed extreme dissatisfaction with the United States over its position in refusing to formally participate in the global strategy to reduce greenhouse gas emissions. The International Meeting did, however, recognize that climate change presents a serious threat to SIDS. Gordon Bispham, Director of the Caribbean

have been hampered and constrained by their limited capacities and have had little assistance from the global community in being integrated fully into the global economy. In recognition of these concerns, the Mauritius Declaration notes that “many SIDS either are not represented in Geneva, or are still grappling with the process of accession to World Trade Organization membership. Most SIDS also experience serious capacity constraints in meeting World Trade Organization obligations.”

Although trade was not as fully acknowledged in the Declaration as many delegates would have liked, the Mauritius Declaration does note that “attention should be focused on the specific trade and development-related needs and concerns of SIDS to enable them to integrate fully into the multilateral trading system.” “Without some kind of recompense for the erosion of trade preferences, we may as well close shop. It is impossible for small economies such as ours to compete internationally,” said the Mauritius Chamber of Commerce representative, Hamid Jhumka. UN Secretary-General Kofi Annan noted that SIDS would prefer to “trade themselves out of poverty instead of living on handouts.”

On these more contentious issues, the decisions may be summarized as follows.

Climate change. The Strategy recognizes that the SIDS are already experiencing “major adverse effects of climate change” and that “adaptation to adverse impacts of climate change and sea-level rise remains a

“All parties have agreed that climate change is having an effect on small islands right now and that we need to put policies in place to reverse this”

the UN in October 2004. The Strategy Paper contained chapters on the priority areas of the BPOA and identified new and emerging issues, including the graduation of SIDS from Least Developed Country (LDC) status, trade, health, capacity building and culture.

The discussions at the International Meeting led to agreement on chapters dealing with: natural and environmental disasters, energy resources, tourism resources, trans-

Policy Development Centre said that “all parties have agreed that climate change is having an effect on small islands right now and that we need to put policies in place to reverse this.”

SIDS have argued for many years that there should be international agreement on the return of trade preferences for them due to their isolation and limited resources. These nations have also argued that for years they

major priority.” It also promotes “increased energy efficiency and development and use of renewable energy as a matter of priority, as well as advanced and cleaner fossil fuel technologies.”

During the panel discussion on environmental vulnerabilities, it was stated that, in some cases, the choice is limited to remaining on the island/atoll or seeking shelter elsewhere. While “natural hazards are inevitable, disasters are not” and efforts must be intensified to increase the resilience of SIDS. The environmental vulnerability index launched at the International Meeting by the South Pacific Applied Geoscience Commission could be used to assess the vulnerability of countries to climate-related impacts.

Trade. SIDS negotiated to secure agreement for special and preferential treatment and for recognition as a new category of countries in the World Trade Organization. The final Mauritius Strategy contains references to the special case of SIDS by prioritizing efforts to integrate them fully into the multilateral trading system.

Waste. The inclusion of liability issues regarding the transboundary movement of hazardous waste, World War II shipwrecks, and transportation of radioactive material was another highly contentious point in the negotiations. On the transboundary movement of hazardous waste, there was agreement for the cessation of such transport in SIDS regions as the “ultimate desired goal”.



The Belize archipelago

Photo: John Soussan

During the International Meeting, SIDS continued to struggle to attract the international support they consider necessary for their sustainable development.

Since the Barbados Conference in 1994, the focus of the international agenda has changed with increasing attention on security concerns, the implementation of the Millennium Development Goals, and the prioritization of domestic good governance over governance reforms at the international level. SIDS wanted to attract attention to their evolving international agenda, including the need to address new and emerging issues such as the impacts of trade liberalization and globalization, information and communication technologies, and health and HIV/

AIDS, in addition to the concerns contained in the BPOA.

The Mauritius Strategy emphasizes that SIDS “are very vulnerable to natural and environmental disasters with devastating consequences to their economy, environment and social life.” The Strategy proposed to use the opportunity of the forthcoming World Conference on Disaster Reduction in Kobe, Japan, to consider the specific concerns of SIDS, including in the areas of insurance and reinsurance arrangements.

Following closely on the tragic impacts of the 26 December Indian Ocean tsunami, the delegates were fully convinced that the worst fears of SIDS could easily become realities. As Kofi Annan observed, the small islands’ posi-

tion carried more weight now because of the “shift in sympathy” by the international community in response to the magnitude of the tsunami tragedy. “Even those who had been a bit sceptical about the impact of global warming cannot say that they have no idea of the damage water can do,” he said.

An encouraging feature of the Mauritius Strategy is the effort to prioritize support for resilience building and vulnerability projects, adding social and economic development considerations to the BPOA and making it considerably more attractive to donors. Supporting this recognition, the United Nations Development Programme – the lead UN agency for the implementation of the Millennium Development Goals – launched a SIDS Resilience Building Facility to assist SIDS to develop the capacity to formulate and implement initiatives to reduce their vulnerabilities.

There is little doubt that the International Meeting strengthened partnerships, increased SIDS’ ownership of responsibility over their sustainable development, renewed and/or reprioritized international community support, improved SIDS-SIDS and South-South cooperation, increased UN specialized agency engagement in SIDS issues and identified new means of implementation, including the launch of the SIDS University Consortium discussed below.

On the other hand, some might criticize the International Meeting’s outcomes, noting that the text does not provide clear direc-

FROM THE PACIFIC

● At their special retreat in Auckland, New Zealand, on 6th April 2004, the Pacific Island leaders adopted their new vision for the Pacific, which seeks to give all Pacific peoples lives that are “free and worthwhile”. In addition to economic growth, socio-cultural and environmental protection, good governance and security were also recognized as key priorities for bringing about sustainable development. Within the Pacific context, the major concerns in the area of economic development include negative or low growth and resource depletion. In social development, there are serious concerns over rising poverty, declining health and education standards and facilities and other equity issues. There are also major environmental issues relating to pollution, waste management, biodiversity loss and natural disasters. And in governance and security, the major challenges are around institutional deficiencies, poor resource management, political instability, breakdown of law and order,

inequalities, trans-national crime and other human security concerns.

A Pacific Plan has been developed to “give effect to” their new vision through the promotion of “deeper and broader regional cooperation”.

The Pacific is fortunate in that it already has a strong institutional framework in the form of regional organizations, institutions and existing sub-regional bodies. This can be used as a foundation for broadening and deepening regional cooperation. It was the view of the leaders that partnership at different levels must be encouraged to meet common responsibilities and provide cost effective services, such as: common regional reporting on international obligations; regional representation at international levels; agreed regional policy frameworks where needed; common laws and policies; legal/legislative services; technical services; transport services; research and data; and training and education.

The Pacific region is noted

for its special governance systems based on traditional ways and indigenous knowledge and practices that promote sustainable development in a Pacific way.

Judging from the attention given to culture during the International Meeting, it is expected that the Mauritius Strategy will help ensure the survival of Pacific communities combining the best of both worlds.

The challenge now is to mainstream sustainable development at a time of decreasing official development assistance to SIDS, declining foreign direct investment flows, diversion of development resources to meet new security obligations, graduation of SIDS from concessional resources, and establishment of new trade rules – all serving to further exacerbate SIDS’ growing vulnerabilities. But as we heard during the World Summit on Sustainable Development and again at Mauritius during the International Meeting, it is all about making it happen by considering measures equal to the task.

tion to other international organizations and processes, such as the international financial institutions and multilateral environmental agreements. There were almost no commitments for new and additional financing or projects at the meeting apart from addressing vulnerability to disasters, such as tsunamis.

In the words of Kofi Annan, SIDS will have to deepen partnerships at all levels – through South-South cooperation, through closer cooperation with developed countries, by engaging more actively with civil society, and by tapping the knowledge and capacities of regional organizations such as the Caribbean Community (CARICOM), the Council of Regional Organisations in the Pacific (CROP) agencies and the Indian Ocean Commission. This will help to effectively implement the Mauritius Strategy.

There was a clear demonstration of this approach to SIDS capacity building for the implementation of sustainable development when the SIDS University Consortium was launched in the final Plenary session. A Memorandum of Agreement was signed by representatives of five founding member institutions: the University of Malta, the University of Mauritius, the University of the South Pacific, the University of the Virgin Islands and the University of the West Indies. The main aim of the consortium is to strengthen the national capacity of small island states to implement the BPOA. The Consortium is expected to improve tertiary level networking through the

promotion of e-learning, participation in the UN Decade of Education on Sustainable Development and by conducting targeted SIDS specific research and training.

At the concluding session, the Secretary-General of the International Meeting, Ambassador Anwarul Chowdhury, repeated his call for a dynamic system of monitoring the implementation of the Mauritius Strategy. “Monitoring should not conclude with simple stocktaking, but should be a process by which implementation loopholes, failures or slackness can be identified and corrective measures taken,” he said. “With the outcome document now in our hands, we have to look forward towards the road to implementation. How we will accomplish this process is in the hands of the stakeholders – the donor community, multilateral financial institutions, civil society, the private sector, regional organizations and the SIDS themselves.”

SIDS can take satisfaction that, ten years after the BPOA was agreed upon, the international community now recognizes the special circumstances of both their fragile environments and their fragile economies. ■

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FURTHER INFORMATION

● **In the Cyberlibrary:** Tiempo Climate Newswatch has made available a series of related articles and video documentaries. These resources, and other SIDS links, are listed in the Tiempo Climate Cyberlibrary at www.tiempocyberclimate.org/floor0/theme/t3637web.htm.

The Tiempo interview

Ambassador Anwarul K. Chowdhury discusses the implementation of the Barbados Programme of Action

Ambassador Chowdhury is United Nations Under-Secretary-General and High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States. He was also Secretary-General of the Mauritius International Meeting to review the Barbados Programme of Action held in January 2005. Tiempo interviewed the Ambassador in the run-up to the Mauritius International Meeting.

Tiempo: The past ten years have seen an increased awareness in the global community of the very special risks facing Small Island Developing States in the context of climate change and sea-level rise. Are Small Island Developing States more or less vulnerable to climate change and impacts today?

Ambassador Anwarul Chowdhury: Small Island Developing States are increasingly vul-

nerable to climate change and its adverse impacts today than ever before. Global warming and climate change are realities supported by empirical scientific data. According to such information available with the United Nations, the average temperature of the earth's surface has risen by 0.6 degrees Celsius since the late 1800s. It is expected to increase by another 1.4 to 5.8 degrees Celsius by the year 2100 which scientists consider a rapid

MAIN POINTS

- **Ambassador Anwarul Chowdhury describes the threats confronting small island states.**

- **He discusses the difficulties in implementing the Barbados Programme of Action and concludes**

that, in the context of climate change, international measures have been inadequate.

- **He argues that greater awareness of the position of Small island States is needed to promote international action.**

and significant change. The main reason for such rise in temperatures is a century and a half of industrialization: the burning of ever-greater quantities of oil, gasoline and coal, the cutting of forests, and certain farming methods.

The sea level rose on average by 10 to 20 cm during the 20th century, and an additional increase of 9 to 88 cm is expected by the year 2100. Higher temperatures result in expansion of ocean volume, and melting glaciers and ice caps add more water. If the higher end of that scale is reached, the sea could overflow the heavily populated coastlines of such countries as Bangladesh, cause the disappearance of some nations entirely, disrupt and pollute freshwater supplies for billions of people and spur mass migrations.

Tiempo: The United Nations Framework Convention on Climate Change was just coming into force at the time of the Barbados

meeting. It has taken ten years for awareness of the need to support measures to improve coping and adaptation strategies in the most vulnerable nations to reach the point where these issues are on the negotiating table. Still, little additional support is available. What needs to be done?

Ambassador Anwarul Chowdhury: The tragic earthquake and tsunami in the Indian Ocean and the consequent destruction of life and property to the low lying coastal areas once again highlights the vulnerability of the Small Island Developing States. This wave of destruction comes on the heels of a number of recent climatic disasters where the impact of sudden climate change has never before been more evident. The 2004 cyclones and hurricanes in the Pacific and the Atlantic that caused large-scale devastation of several small islands were dramatic examples of the destruction that could result from climate change. Increased knowledge and awareness of issues are prerequisites to decisions for actions to implement programmes and measures.

In the preparations for the ten-year review of the Barbados Programme of Action, the Office of the High Representative, in accordance with its General Assembly mandate, has raised this international awareness through its strong and persistent advocacy of the issues of concerns to the Small Island Developing States. This has been done in the Pacific and Caribbean regions, within the United Nations and other multilateral bodies like

the World Bank, and amongst the developed and donor countries. Again, international awareness and concern resulting in measures to achieve the objectives of the Barbados Programme must duly translate into timely availability of adequate resources, without which the international development agenda targeted to the disadvantaged groups of countries like the Small Island Developing States cannot be implemented.

Tiempo: A major aim of the Barbados Programme was to reduce the vulnerability of Small Island Developing States to environmental change. What progress has been made in implementing the Barbados Programme?

Ambassador Anwarul Chowdhury: The Barbados Programme of Action has given guidelines and objectives for the international community for promoting sustainable development in Small Island Developing States and to take steps to reduce the adverse impact of climate change and environmental disasters. However, international measures in this regard have been inadequate during the last ten years. Small Island Developing States made their disappointment clear in the subsequent reviews of the Barbados Programme (and especially at the five-year review in 1999), as well as during the preparatory process for the Mauritius International Meeting.

Important international instruments like the Kyoto Protocol and the Yokohama Strategy for Disaster Reduction require to be im-

plemented seriously and on a timely basis, and such measures must be continuously strengthened, in order to turn around the adverse effects of global warming. Strong international advocacy, as that carried out by High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States, will go a long way in achieving these critical objectives.

In view of this lack of forward movement in implementing the Barbados Programme, the 56th session of the General Assembly identified the need for strong high-level international advocacy and enhanced efforts to mobilize resources for the Small Island Developing States. It was in this context, and on the recommendation of the Secretary-General of the United Nations, that the Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and the Small Island Developing States (UN-OHRLS) was established.

Small Island Developing States need to understand the impact that the work of this Office has had and can have on the further implementation of the Barbados Programme and strongly support and promote the activities of the Office. Otherwise, even after Mauritius, international awareness will not be promoted and the awareness will diminish resulting in the dilution of international support and resources to implement the priorities of the Barbados Programme. The realization on the part of many Small Island

Developing States to the importance of such follow-up activities, and who can do it, and how this can be done, has not been fully revealed in international dialogues. It is hoped that the International Meeting in Mauritius will change their approach.

It is also essential to realize that the Small Island Developing States' agenda has gone beyond the Barbados Programme. As discussed on the UN-OHRLS website (www.un.org/ohrls/), some new and emerging issues, namely trade, HIV/AIDS, renewable energy resources and further use of the latest information communications technologies, have been identified and have begun to impact the Small Island Developing States in their development efforts. These need the urgent and deliberate attention of the international community. It is here that the advocacy and support for the mobilization of resources that can be provided by UN-OHRLS can go a long way in helping to resolve these vital matters affecting the Small Island Developing States. The Small Island Developing States must realize the importance of the role of UN-OHRLS and support and promote this organization. Otherwise, these issues may not receive the requisite attention of the international community in the aftermath of the Mauritius International Meeting.

The above background has been given to show that when it comes to the Barbados Programme the implementation of the priorities is an ongoing process for the development of the Small Island Developing States. In addition,



Ambassador Anwarul Chowdhury

tion, there are the new and emerging issues. One should not miss this point of the need to use the Barbados Programme as a basis for international cooperation with the need to take continuously into account the stock of new and emerging issues. Hence, the International Meeting scheduled for Mauritius will go beyond sustainable development. At the same time, it would be impractical to demand the 'implementation' of all the 14 priorities at once. The objective should be to identify immediate and pressing priorities that address urgent needs of the people in the Small Island Developing States and where resources and capacities will be forthcoming in the next few years. At the same time, the inter-

national stage should be set for cooperation towards tackling as effectively as possible the entire range of priorities on a continuous and deliberate basis with resources and technologies sought on a continuous basis in cooperation with international community and the donors in particular by identifying needs periodically.

Tiempo: How optimistic are you that the people of the Small Island Developing States will be able to meet the challenge of future environmental change?

Ambassador Anwarul Chowdhury: While it is always good to be optimistic, seeing what little was done to advocate the issues relating to Small Island Developing States and the inability to mobilize international resources to implement the Barbados Programme in the last decade, some degree of pessimism may have set in. What transpires at the International Meeting in Mauritius will be crucial for the Small Island Developing States' agenda. The nature of the outcome and degree of genuine international support that the Small Island Developing States can garner for their cause in Mauritius will determine the degree of optimism that they can afford to have! ■

● Acknowledgements

The editors thank Francois Coutu of the Strategic Communication Division of the UN Department of Public Information and Nosh Nalavala of the UN Office of the High Representative for their assistance.

FOOD SECURITY

One in six countries faces food shortages this year because of droughts that could become permanent as a result of global warming, warn United Nations scientists.

Wulf Killmann, chair of the Food and Agriculture Organization's climate change group, says that "Africa is our greatest worry. Many countries are already in difficulties... and we see a pattern emerging. Southern Africa is definitely becoming drier." Some 34 countries, including Ethiopia, Zimbabwe, Malawi, Eritrea and Zambia, are now experiencing droughts and food shortages.

Read more:
www.tiempocyberclimate.org/newswatch/arnews05.htm#050710

MESSAGE TO G8

The national science academies of the G8 nations and others, including China, India and Brazil, have issued a strong statement calling on their governments to take immediate action to limit global warming.

The statement, sent to world leaders in the run-up to the G8 summit in Gleneagles, Scotland, in July, is clearly intended to put additional pressure on the United States to take part in a post-2012 global emissions control regime. "The scientific understanding of climate change is now sufficiently clear to justify prompt action," according to the statement.

Read more:
www.tiempocyberclimate.org/newswatch/arnews05.htm#050619

DESERTIFICATION

The Desertification Synthesis concludes that desertification threatens to increase by millions the number of poor people forced to migrate.

Based on information generated for the Millennium Ecosystems Assessment, the analysis ranks desertification as amongst the world's greatest environmental challenges. The report's authors consider that "given the size of populations in drylands, the number of people affected ... is likely larger than any other contemporary environmental problem."

Read more:
www.tiempocyberclimate.org/newswatch/arnews05.htm#050626

BANGLADESH

Following the shortest winter in a decade, Bangladesh experienced the longest wait for the summer monsoon in 33 years.

The monsoon arrived on June 20th, two weeks late. "Our records show the last time the monsoon came so late was in 1972 when it arrived on June 14th, reported Akram Hussain, Bangladesh Meteorological Department director. Hussain blamed the disruption of the seasons on climate change. "We believe these adverse impacts are mostly due to global warming ... as our studies also have shown that the temperature is gradually rising in the country."

Read more:
www.tiempocyberclimate.org/newswatch/arnews05.htm#050703

LINK TO POVERTY

The report 'The Global Climate and Economic Development' highlights the threat that the chasm between rich and poor will widen as a result of climate change.

Poverty and environmental degradation must be considered a single issue, it concludes. Rajendra K. Pachauri, chair of the Intergovernmental Panel on Climate Change, predicts that "the impacts of climate change will fall disproportionately upon developing countries and the poor persons within all countries. It will therefore exacerbate inequalities in health status and access to adequate food, clean water and other resources."

Read more:
www.tiempocyberclimate.org/newswatch/arnews05.htm#050703

The CDM is failing

Ben Pearson argues that the Clean Development Mechanism is failing in its mandate to promote sustainable development

The current discussions on possible extension or replacement of the Clean Development Mechanism (CDM) must be based on an acknowledgement that the CDM in its current form is failing in its mandate to promote sustainable development. Most notably it is not financing projects that help in the long-term transition of developing country energy sectors towards renewable energy technologies.

The problem is fundamental and stems from the CDM structure as a project-based market mechanism in which the search for least-cost carbon credits is the paramount consideration. This sidelines projects like renewables by not rewarding the multiple benefits they provide. Ultimately, the CDM's first mandate to help reduce Kyoto compliance costs is all but making the fulfilment of its second mandate to promote sustainable development impossible.

The current status of the CDM

The question of whether the CDM is promoting sustainable development can be framed primarily in terms of whether it is promoting renewables in developing countries and thus assisting in the transition away from fossil fuels. The evidence to date, however, is that most industrialized country governments and corporations are using the CDM merely to reduce the costs of complying with their Kyoto targets and as such are searching for projects that deliver large volumes of cheap

MAIN POINTS

- **The author argues** that the Clean Development Mechanism is a market not a development fund.
- As such, it is biased against renewable energy projects, despite their broader

benefits.

- **He concludes** that the Clean Development Mechanism should be a technology transfer mechanism, not a technology-neutral commodities market.

credits. These are most commonly projects that capture or destroy gases with high global warming potential like methane, nitrous oxide and hydrofluorocarbons (such as HFC-23) at existing facilities. Yet these projects merely shift the location at which emissions reductions are made through the Kyoto Protocol without delivering additional sustainable development benefits to host countries. They do not help catalyze fundamental shifts in energy production and use. (This is not to ignore, though, that landfill gas projects can result in improvements in local air quality from the reduction of noxious odours.)

Projects based on renewables are numerous; indeed they are the most common project type. (The renewables category only includes hydropower projects below 10MW.) Yet these projects are generating only about eleven per cent of all carbon credits through the CDM, which amounts to around 32 million in total. This is less than the 40 million credits

resulting from the two HFC-23 projects and about one half the 70 million credits that will be generated by a nitrous oxide project in South Korea. It is these credit volumes which provide the most meaningful comparison: the CDM involves industrialized countries buying carbon credits as a commodity so the percentage of credits indicates the proportion of total carbon investment flowing through the CDM to particular technologies. It is also clear that many of the renewables projects are intended merely to 'green' portfolios that rely on less attractive technologies for the majority of their credits.

In June 2004, the World Bank's Carbon Finance Business Unit published the report *Estimating the Market Potential for the Clean Development Mechanism*. The report noted that "the current distribution of projects may not be representative of the mature CDM market." In future, the Bank suggests that participants may concentrate on proven project types that are cost-effective and have an approved methodology, citing as an example the concentration on landfill gas projects by Japanese corporations. The steady increase in landfill gas projects suggests this is correct. At the time of writing, landfill gas projects alone were claiming more carbon credits than all renewables projects combined. Up to 2012, 15 landfill gas projects are claiming 28 million credits whilst 52 renewables projects are claiming 25 million credits.

A prophecy fulfilled?

The problems besetting renewables can hardly be seen as unexpected. The experience of renewables in liberalized energy markets has not been positive, and it can come as no real surprise that they have not flourished in a market mechanism like the CDM. Indeed, alongside the early hype that accompanied the CDM's birth were more sober analyses of how renewables would fare under the new mechanism.

Only months after the 2001 Marrakech Accords that finalized the CDM's rules, Ecofys, in the report *Opportunities for Renewables under the Kyoto Mechanisms*, concluded that "various studies indicate a limited role for renewable energy projects under the Kyoto Mechanisms." Moreover, they predicted that "Kyoto Mechanisms dominated by least-cost approaches only would seriously limit the

newables promotion mechanism. Its aim is to provide tradeable emission reduction credits at the lowest cost in a limited timeframe, primarily up to 2012. Its aim is not to direct funding to projects that provide the greatest environmental and social benefit or that help direct a developing country down a sustainable development path in the long term.

An increasingly frequent complaint about the CDM, not just in the non-governmental organization community, is that the CDM is not 'working', in that it is not driving sustainable development and not funding renewables. But the real problem is conversely that it is working perfectly in doing what a market-based mechanism is designed to do: discover and direct funding to projects that will produce the maximum volume of carbon credits for every dollar invested. The problem for renewables is that they require

“Arguably, the CDM project-based structure makes it almost impossible for the broader... benefits provided by a renewables project to be rewarded”

scope for renewable energy projects,” although noting a range of other influencing variables.

What are the problems?

Fundamentally, the reason that the CDM is not promoting renewables projects is that despite the rhetorical trimmings the CDM is a market, not a development fund nor a re-

more investment to produce a carbon credit than most other available options.

While the CDM is rhetorically mandated to assist in achieving sustainable development and this should benefit renewables, no part of the CDM's architecture specifically monetizes those benefits and as such they play a very limited role, if at all, in directing investment. For all the rhetoric about sustainable



Renewable energy in the Gobi Desert, Mongolia

Photo: Anders Arvidson

development, projects generate revenues through the CDM by reducing or storing a quantity of greenhouse gas emissions which are commodified as carbon credits and sold. The various co-benefits that these projects may create are not commodified and do not directly produce revenues through the CDM.

Arguably, the CDM project-based structure makes it almost impossible for the broader sectoral or national benefits provided by a renewables project to be rewarded because they are so difficult to quantify on a project level. Judging how many tonnes of a specified greenhouse gas have been reduced or

stored by an individual project in a delineated project boundary as compared to a theorized business as usual scenario is complex enough. Yet quantifying and commodifying the additional benefits that a renewables project provides outside that boundary would be extremely difficult and prohibitively expensive for each individual project. Some developers do, of course, assert broader benefits.

Fundamentals

The dominance of large non-carbon dioxide projects in the market- and project-based CDM is inevitable. They involve relatively inexpensive, quick and common-practice additions to existing facilities, which in return generate huge volumes of carbon credits because of the global warming potential of the gases they capture. In contrast, renewables projects have a financial profile that is the exact opposite of that favoured by the CDM. They are new developments which are capital intensive, provide low rates of return and generate relatively small volumes of carbon credits.

Given the current low price for credits and the fact that renewables only displace carbon dioxide emissions, the revenues from the sale of carbon credits are usually small and do not significantly improve the project's internal rate of return. Moreover, the prevalence of a commodity model for the purchase of the carbon credits – in which the credits are bought as they are delivered over the 10- or

21-year crediting period – does not directly address the major financial barrier for renewables projects: their high upfront costs.

Experience is also showing that most banks, which are already wary of developing country renewables projects, do not currently see carbon credits as enhancing a renewables project's appeal and are reluctant to lend against a carbon credit purchase agreement. Indeed, as the recent Organisation for Economic Cooperation and Development (OECD) report *Taking Stock of Progress under the Clean Development Mechanism* has observed, if a renewable project's viability is dependent on carbon credits it may actually be adjudged even more risky.

Smaller credit volumes mean that renewables also suffer disproportionately from the transaction costs associated with approving a CDM project and monitoring its ongoing reduction of emissions. Transaction costs are generally similar regardless of project size. Thus, for projects with smaller credit volumes they are significant while for large projects they are often negligible. While a small-scale CDM project category exists to streamline the process for renewables and reduce these costs, they are still a disproportionately greater burden than for large projects.

Boutique credits

Some buyers will undoubtedly be prepared to reward projects with additional sustainable development benefits by paying a pre-

mium for their credits, mainly for public relations reasons. It is unlikely, however, that such 'boutique' CDM credits will be more than a fraction of overall investment and credit volumes. The World Bank Community Development Carbon Fund (CDCF), for example, expects to generate about seven million credits in total with about 60-70 per cent available by 2012 (information provided by the World Bank Carbon Finance Helpdesk, 21st July 2004). This is about half the ten million credits that the Prototype Carbon Fund coal bed methane project will produce in that timeframe (information provided 4th November 2004).

Early experience with allegedly high quality funds also shows that, even with a higher price and political incentive, renewables do not necessarily come out on top. The first two projects unveiled by the CDCF are another

which is widely accepted as the benchmark for sustainable hydro development.

Ultimately, these funds will be marginal in terms of credit generation. Their existence can be seen as a tacit admission that left to itself the market will not finance high quality projects.

Race to the bottom

The primary focus of the CDM on producing a tradeable commodity in a specific project boundary at the lowest cost frustrates environmentally-superior outcomes by directing investors and buyers away from projects with the most overall benefits. Buyers and investors favour projects that require the least investment, least technology transfer and that provide the least sustainable development co-benefits as these produce the cheapest credits.

“The market will seek out the cheapest credits, not the best environmental outcome”

landfill gas project and another large hydropower project. Moreover, both have had their registration blocked by the CDM Executive Board over their eligibility as small-scale projects and additionality concerns. Furthermore, the large hydro project does not even mention the principles and guidelines of the World Commission on Dams' final report (www.dams.org), published in the year 2000,

CDM on the margins

Any discussion about the future of the CDM must also address the fact that it, and the carbon market itself, exist on the margins of huge financial flows to carbon-intensive energy projects in the South. Globally, North-South flows of investment and governmental support through export credit agencies and international financial institutions over-

whelmingly favour fossil fuels, locking them into developing country energy systems to a degree that makes the new financial flows achieved by the CDM and emerging carbon market largely irrelevant.

More broadly, Point Carbon has estimated, in the report *Removing Subsidies: Levelling the Playing Field for Renewable Energy Technologies*, that the value of contracts in the global carbon market could reach US\$10 billion a year by 2008. Yet annual subsidies to fossil fuels are estimated at up to US\$235 billion, of which US\$162 billion is in non-OECD countries.

If the amount of new money for climate-friendly technologies mobilized by the global carbon market continues to be less than five per cent of annual fossil fuel subsidies then it will exist merely to enrich traders and consultants.

What is to be done?

There are obviously variables which could improve the usefulness of the CDM for all projects, including renewables. But if the CDM continues to function as a market, in which least-cost considerations dominate, then it will continue to be technology neutral and if there are cheaper options than renewables projects then they will be given preference. The market will seek out the cheapest credits, not the best environmental outcome. If the aim of a future CDM-type mechanism is to continue finding cheap carbon credits for countries with reduction targets then

perhaps few changes are needed beyond simplifying the project approval process. But the pretence that it will do more than that must stop.

If Parties to the Climate Convention want a mechanism within the Kyoto framework that promotes sustainable development in the South then it must be a targeted technology transfer mechanism, not a technology neutral commodities market. Its point of departure must be the promotion of projects that contribute to sustainable development, such as renewables, with the rules and modalities designed to deliver this outcome. A range of action plans for the promotion of renewables in the South exist, originating from the G8 to Greenpeace. The new economics foundation has provided a useful summary in *The Price of Power*.

More important still is to address the context in which this future mechanism will function. If it operates within the current policy perversity in which the Kyoto Protocol and CDM exist alongside massive North-South financial flows to fossil fuels then it will fail. As the report *The Climate of Export Credit Agencies*, from the World Resources Institute, has noted, "governments pursue one set of objectives through climate negotiations, while their finance and trade arms ignore the global environmental implications of their activities." A real solution to climate change and sustainable development must divert these flows, not create carbon markets alongside them. ■

ABOUT THE AUTHOR



● **Ben Pearson** is director of CDMWatch, based in Sydney, Australia. CDMWatch is a non-governmental organization that monitors and analyses the Clean Development Mechanism and individual Clean Development Mechanism projects and helps civil society groups engage with the Clean Development Mechanism process.

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Web: www.cdmwatch.org

FURTHER INFORMATION

● **In the Cyberlibrary:** The Tiempo Climate Cyberlibrary provides a listing of theme sites on the Clean Development Mechanism at www.tiempocyberclimate.org/floor0/theme/t53web.htm. See also the special issue of Tiempo on this topic, available as a low resolution (www.tiempocyberclimate.org/floor0/recent/pdf/tiempo53low.pdf, 0.6Mb) or high resolution (www.tiempocyberclimate.org/floor0/recent/pdf/tiempo53high.pdf, 3Mb) download.

CONFERENCES

9th International Conference on Environmental Science & Technology

Rhodes Island, Greece
01-09-2005 to 03-09-2005

Organized by the Global Network for Environmental Science and Technology and the Department of Environmental Studies at the University of the Aegean. Conference will focus on global environmental change and ecosystems management, water quality issues, water resources management and planning, and solid waste management, recycling and sustainability. Will also present the most recent developments associated with related environmental problems.

Details: Conference (9CEST) Secretariat, University of the Aegean, 30 Voulgaroktonou str. GR 114 72 Athens, Greece.

Fax: +30-210-6492499.

Email: cest@gnest.org

On the Web: www.gnest.org/cest

ICB 2005

Garmisch-Partenkirchen, Germany

05-09-2005 to 09-09-2005

The 17th International Congress of Biometeorology has, as its main theme, "Adaptation to weather, climate and climate change". Organized by the International Society of Biometeorology. Focus topics for forum discussion include: climate, weather and human health; agricultural and forest meteorology; effects of extreme climates on humans, plants and animals; urban

climatology; and, phenology, amongst others.

Details: Congress Secretariat, INTERPLAN AG, Albert-Rosshaupter Str 65, D-81369 Munich, Germany.

Fax: +49-89-54823443.

Email: icb2005@i-plan.de

On the Web: www.icb2005.de

River Basin Management 2005

Bologna, Italy

06-09-2005 to 08-09-2005

Conference is aimed, in particular, at bringing together practising engineers, environmental managers and academics in the field. Case studies are encouraged where delegates can share problems and solutions with the wider international community. Specific topics include: river ecology; flood forecasting; geomorphology; and, field and laboratory data for riverine basins.

Details: Rachel Green, River Basin Management 2005, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton SO40 7AA, UK.

Fax: +44-0238-0292853.

Email: rgreen@wessex.ac.uk

On the Web: www.wessex.ac.uk/conferences/2005/rbm05/absform.htm

Millennium + 5 Summit

New York, USA

14-09-2005 to 16-09-2005

High-level Plenary Meeting of the UN General Assembly to follow up on the outcome of the Millennium Summit. The report entitled "In larger freedom: towards development, security and

human rights for all" which has been submitted by the Secretary-General, will act as a background discussion paper. The UN Non-Governmental Liaison Service (UN-NGLS) is participating in the preparatory process and is coordinating the input from other NGOs.

Details: Tony Hill, UN-NGLS Coordinator, Room DC1-1106, United Nations, New York NY 10017, USA.

Fax: +1-212-9638712. Email: ngls@un.org

On the Web: www.un-ngls.org

2nd International Congress & Innovation Fair: Sustainable Management in Action

Geneva, Switzerland

19-09-2005 to 20-09-2005

Organized by the Association of Sustainable Management in Action and the University Centre of Geneva for Human Ecology and Environmental Sciences. Main plenary topics include: concepts and strategies in sustainable management; tools of sustainable management; technological innovations in sustainable management; and, forum of Small and Medium Micro-enterprises.

Details: Therese Wolf, Secretariat SMIA05, 20 Avenue du Grey, Ch-1004 Lausanne, Switzerland.

Fax: +41-21-6465935. Email:

organisation@smia.info

On the Web: www.smia.info

Seventh Annual Bioecon Conference on Economics & the Analysis of Ecology & Biodiversity

Cambridge, UK

20-09-2005 to 21-09-2005

Organized by University College London and University of Cambridge in the UK together with the Norwegian University of Science and Technology. Sessions will examine the management of biological resources and biological processes as well as sessions discussing the economic analysis of policies for biodiversity conservation. *Details: Per Stromberg, Department of Land Economy, University of Cambridge, 19 Silver Street, Cambridge CB3 9EP, UK. Email: pmjs2@cam.ac.uk*
On the Web: www.bioecon.ucl.ac.uk

Promoting a Sustainable Energy Culture in Europe

Cork, Ireland

20-09-2005 to 23-09-2005

Co-organized by Energy Services Ltd and Cork City Council, aimed at providing a forum for discussion of energy issues confronting Europe both now and in the future. Will include practical examples of sustainable energy projects and case study presentations looking at the issues, identifying solutions and the opportunity to meet with providers. Aimed at energy users, policy makers, service and technology providers and all others interested.

Details: Elva Hickey, Conference Partners, 96 Haddington Road, Ballsbridge, Dublin 4, Ireland. Fax: +353-1-6643701.

Email: elva@conferencepartners.ie

On the Web: www.energy-services.ie/Conference

EVENTS

24th Session of the IPCC Montreal, Canada

26-09-2005 to 28-09-2005

The 24th session will continue the work of the Intergovernmental Panel on Climate Change in assessing comprehensively and objectively scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change. The 24th session will be preceded, between the 22nd and 24th September, by the 8th session of Working Group Three.

Details: IPCC Secretariat, WMO Bldg, Case Postale 2300, CH-1211 Geneva 2, Switzerland.

Fax: 41-22-7308025.

Email: ipcc-sec@wmo.int

On the Web: www.ipcc.ch

6th Open Meeting of the Human Dimensions of Global Environmental Change Research Community Bonn, Germany

09-10-2005 to 13-10-2005

Sub-title for the meeting is "Global Environmental Change, Globalization and International Security: New Challenges for the 21st Century". Session topics, amongst others, include: adaptive management and resilience; coastal zones, human use of oceans; institutional dimensions of global environmental change; and, methods in human-environment studies.

Details: Lisa Mullin, Open Meeting 2005 Organizer, University of Bonn, Regina-Pacis-Weig 3, D-53113 Bonn, Germany.

Email: mullin.ihdp@uni-bonn.de

On the Web: www.uni-bonn.de

2nd Southern Deserts Conference Arica, Chile

10-10-2005 to 14-10-2005

Theme for the conference is "Human-Environment Interactions in Southern Hemisphere Deserts: Past, Present and Future". Will include discussion on the late quaternary climate, environment and culture, resource use in prehistoric, preindustrial and industrial times, and spatial and social organization through time. There will also be a pre-conference excursion from the 8th to 10th October and a post-conference excursion from the 14th to 17th October.

Email: csantoro@uta.cl

On the Web: www.uta.cl/AricaMeet-ing2005

3rd International Conference on the Oceanography of the Ross Sea Antarctica

Venice, Italy

10-10-2005 to 14-10-2005

Conference intends to identify methods and tools which will assist in implementing observation systems, models and new technological methods of exploration in high-latitude oceans. Participants will identify research questions that would benefit from new tools and methods developed for polar regions as well as working together to stimulate interdisciplinary research and further understanding.

Details: Ross Sea 2005 Conference, CNR-ISMAR, San Polo 1364, 30125 Venice, Italy.

Fax: +39-041-2602340.

Email: rosssea@ismar.cnr.it

On the Web: www.ve.ismar.cnr.it

Renewable Energy: Policy, Security, Electricity, Sustainable Transport, Water Resources/Management and the Environment

Brighton, UK

15-10-2005 to 21-10-2005

Seminar intends to review the role of renewable energy systems in meeting world energy demand in electricity and focus on up-to-date technologies in manufacturing buildings, transport and water resources and management. Sponsors include UNESCO, the UK Department of Trade and Industry, the National Renewable Energy Laboratory, and Future Energy Solutions, amongst others.

Details: World Renewable Energy Congress, PO Box 362, Brighton BN2 1YH, UK. Fax: +44-1273-625768.

Email: asayigh@netcomuk.co.uk

On the Web: www.WRENUK.co.uk

Greenhouse 2005: Action on Climate Change

Melbourne, Australia

13-11-2005 to 17-11-2005

Conference aimed at all representatives from research and development organizations, government, industry and the community. Discussion will be multidisciplinary and broad in its focus on climate change and the need

for all levels of government, industry and scientists to work together. Main themes will cover likely impacts of climate change, adaptation strategies and approaches to reducing atmospheric greenhouse gas concentrations.

Details: Greenhouse 2005, CSIRO, Private Bag 1, Aspendale, VIC 3195, Australia. Fax: +61-3-92394444.

Email: info@greenhouse2005.com

On the Web: www.greenhouse2005.com.au

Green Power Mediterranean: The Sustainable Meeting Place Rome, Italy

15-11-2005 to 16-11-2005

Intended to create a focused venue for networking and knowledge transfer to further the adoption of renewable energy systems and energy efficiency programmes in the Mediterranean region. Forum topics include: sustainable energy financing; regional emissions trading; regional interconnection and transmission; renewable islands; progressive policy and regulation; and presentation of a number of successful renewable energy systems case studies.

Email: info@greenpowerconferences.com

On the Web: www.greenpowerconferences.com/events/GreenPowerMed.htm

Perceptions in the Himalayas

Ngamindra Dahal describes how climate change impacts are perceived locally in parts of the Himalayas in Nepal, and proposes activities to reduce vulnerability

Ecological changes noticed in the high Himalayas indicate that global warming will have a serious impact on the lives and livelihoods of local communities. Communities in the Mustang and Manang Districts of Nepal have already begun experiencing unusual changes in weather patterns. Some of them are happy with these changes; for example, farmers have noticed improved apple sizes in recent years. But others face hardship; for example, water leakage into traditional houses has increased, which people feel is due to new precipitation patterns. These findings need to be validated by scientific studies, but the urgency to support affected communities is already clear. They need help to enable them to respond to the new challenges posed by climate change.

Most highland communities depend on cattle and sheep farming and, therefore, have serious concerns over the declining produc-

tion of grass in the Himalayan grasslands. This is mainly due to moisture deficiencies resulting from reduced snow deposits. Local people have also noticed spectacular changes in their surroundings in the last couple of decades; hillsides that once used to be covered in snow throughout the year are now bare and dry. Stream flow and spring characteristics have changed dramatically in recent

MAIN POINTS

- **Ngamindra Dahal** describes local perceptions of the changing climate in the Himalayas, many of which are supported by scientific observations and predictions.
- **Such changes** are already affecting the lives and livelihoods

of local people in both positive and negative ways.

- **He concludes** that most people are unaware of the real consequences of global warming and proposes several locally based activities to reduce vulnerability.

years, making it challenging to manage water supplies.

Local perceptions of changes

Many of the highland residents of Manang in the Annapurna Range of the Himalayas have observed heavy monsoon rains in recent years. This type of erratic monsoon precipitation is a new phenomenon. Previously, monsoon rains used to be of lower intensities and amounts, and heavy monsoon rains only occurred at lower altitudes. Intense rainfall has affected traditionally-built flat-roofed houses made of mud and stone. Roof leakage and wall erosion problems are a major concern for low-income families who cannot afford to regularly repair their houses. Narendra Lama, a conservation officer in Manang, says, “problems from the leakage of rainwater through the roofs of traditional mud houses have increased in recent monsoons. The number of people seeking support

IMPACTS ON LIFE AND LIVELIHOOD SOURCES

Changes in temperature, wind and precipitation	<ul style="list-style-type: none"> • Winters are less cold and frosty • The river valleys of Kali Gandaki are getting windier • Less snowfall in winter • Increased rain and snowfall after winter • Unusually intense summer rainfall
Weather hazards	<ul style="list-style-type: none"> • Increased frequency of avalanches, flash floods, wind-storms and hailstorms • Rainfall patterns are getting more erratic; there are long droughts and sudden heavy rains • More loss of life and property from harsh weather incidents
Vegetation	<ul style="list-style-type: none"> • The altitude of the tree line is rising • Grasslands are less green because reduced snowfall results in moisture deficiencies and less grass production
Water supply and housing	<ul style="list-style-type: none"> • Reduced water flow in local streams and springs • Unpredictable fluctuation in flow levels and timing of seasonal spring recharging • More roof leakage and wall erosion in traditional mud houses • Water supply is a major problem leading to the abandonment of some old settlements in Mustang
Agriculture	<ul style="list-style-type: none"> • Bigger tasty apples at higher altitudes where it used to be too cold for apple farming; apple orchards and nursery farms are emerging • Successful farming of cabbage, cauliflower, cucumber, chili and tomatoes in open gardens (without a greenhouse)
Lifestyle/business	<ul style="list-style-type: none"> • Older people find their villages more comfortable due to warmer winters • Tourism businesses are more profitable due to longer drought periods in the post monsoon months • Agricultural businesses suffer due to reduced irrigation and variable precipitation patterns

Source: Based on personal observations and communications with local residents and development workers in Mustang and Manang between October 2003 and March 2005.

from us to repair their houses has suddenly jumped.” The rooftops are also traditionally designed to accumulate winter snowfall for meeting domestic water needs. Decreased winter snowfall could eventually lead to a shortfall in the village water supply.

Some farmers in Mustang, the neighbouring district to Manang, say that the changed climate has significantly impacted their lifestyles. They are confident that the climate has changed, not because they know much about global warming or reports of rapidly receding Himalayan glaciers, but because of their long experience with the realities of the local environment. For most of them the impact is positive. Farmers are growing new vegetables such as cauliflower, cabbage, chili, tomato and cucumber, which used to need greenhouses to survive. Local fruits have better sizes and tastes. New plants that only used to grow at lower altitudes can now be found. Many note the fact that their Himalayan district is greener than it was a few decades ago. Local residents say this is because of the changing climate rather than technological inputs or improved seed varieties.

Shenjing Gurung, a 53-year-old resident of Muktinath Valley (located at an altitude of 3500 m) in Mustang District, is happy with the warming climate. He says “I have not experienced a long chilly winter in the last five or six years.” Gurung is a mountain farmer, and in addition to the relatively warm and snow free winters, he has noticed changes in the farming of vegetables and crops. When

asked whether the changes were due to development interventions, Gurung says, “credit for the new vegetable varieties partly goes to development programmes that have been implemented over the last ten years and partly to the change in climatic patterns. Better tasting and larger apples are due to the climate.”

Climate change affects different crops in different ways. These varying interactions between the climate and crops shape the perceptions that farmers have about climate change. For example, farmers engaged in apple farming benefit from the warming climate while those traditionally dependent on wheat, potato and other local crops and vegetables have suffered. Similarly, families dependent on tourism businesses benefit from the longer drought periods following the monsoon, as this helps increase the numbers of tourists visiting their areas. In contrast, some of those running agricultural businesses suffer due to variable precipitation patterns and reduced opportunities for irrigation.

Elderly people believe that weather induced hazards such as large avalanches, windstorms and hailstorms are increasingly common. In the summer of 2003, a herd of 36 yaks was killed near Jomsom. “There is no doubt that the region has warmed up in recent decades,” says former District Development Committee Chairman and local businessman Nirmal Gauchan. He adds that the emerging mosquito problem in the Jomsom



A traditional mud house in Tsale Village, Mustang District

Photo: M. Chetri

Valley, located at an altitude of 2700 m, may be an indicator of the warming climate.

The implications of local perceptions

In many cases, stories from local people confirm findings from recent scientific studies, particularly about shrinking snow cover and retreating glaciers. A study conducted by The International Centre for Integrated

Mountain Development and the United Nations Environment Programme in 2000 identified 3252 glaciers and 2323 glacial lakes in Nepal. An analysis of this inventory suggested that 20 of these glacial lakes were potentially dangerous. Excessive melting of glaciers increases the size of lakes, which can eventually burst out of their confines generating tremendous floods downstream.



Local women from a high Himalayan village fetch potable water from a pond in winter

Photo: M. Chettri

Meteorological data for Jomsom from 2002 to 2004 also supports local views. Rainfall data indicates a decrease in winter precipitation and an increase in rainfall after the winter months. Snowfall in the post-winter season affects crop farming, but people have a strong belief that current changes in the rainy season are temporary and will eventu-

ally revert back to how they used to be.

The local observations described above provide a clear direction for future research and for development planning and disaster management programmes in the high Himalayas. More scientific studies are needed to validate these observations. However, some research on climate change impacts and the

associated risks in mountainous regions has been conducted. Some of this is discussed in the following sections.

Melting glaciers and glacial lake outburst floods

According to one recent study, Nepal's temperature is rising by about 0.41 degrees Celsius per decade. Another study conducted in the vicinity of Tsho Rolpa Glacial Lake in Dolakha District suggests that mean temperature is increasing annually by 0.019 degrees Celsius with an increase in average summer temperature of 0.044 degrees Celsius. This is causing rainfall to increase by 13 mm per year, while the number of rainy days is decreasing by 0.8 days per year suggesting that rainfall occurs in bursts. Consequently, river flow is increasing at $1.48 \text{ m}^3/\text{s}$ per year, which is about 1.5 times higher than increases in precipitation. High increases in summer river flow provide further evidence that high summer temperatures are leading to fast glacial melt.

The rate of glacial retreat reached up to 1.79 m per year in the 1970s and 2.4 m per year in the 1980s. As a result of fast glacial melt, new glacial lakes have formed and those already existing have grown rapidly. This alarming highland trend threatens downstream communities and the environment due to the increased risk of glacial lake outburst floods. The occasional bursting of glacial lakes in the past has seriously damaged the lives and livelihoods of mountain communities. Such threats operate in conjunction with other

changes to the patterns of river flow, spring water recharge, precipitation and vegetation types expected as a result of global warming in the Himalayas.

Rise in water related hazards

Weather related extreme events like excessive rainfall, longer drought periods, landslides and floods are increasing both in terms of magnitude and frequency. Mean annual precipitation is increasing, as is the occurrence of intense rainfall. This causes more erosion of soils and riverbeds and banks, as well as sedimentation on fertile land. More floods and glacial lake outbursts will destroy irrigation and water supply systems, roads, bridges, settlements and productive land. Flood-related deaths will increase. Land degradation will reduce crop productivity and put more pressure on remaining fertile land. In the dry season, increased evaporation will lead to water scarcity. Soil moisture deficits, droughts, fire and possible pest outbreaks will decrease crop yields. Climate change will have major impacts on ecosystems, land and water resources, health, and major economic sectors such as agriculture.

Increasing mountain community vulnerability

The vulnerability of mountain dwellers is likely to increase due to changes in rainfall patterns. Increased water related hazards and a shift in the rainy season will affect household incomes, most of which depend

on subsistence farming. Health effects could include the extension of ranges of vector-borne diseases such as malaria and encephalitis to mountain settlements. Progress in environmental management has been slow and natural resource degradation remains at the core of many problems. Climate change will be a new stress to ecosystems and socioeconomic systems already affected by poverty, natural resources depletion and unsustainable management practices. Climate change impacts on land resources will make management even more difficult if appropriate measures are not taken.

The looming water crisis

Mountains are a source of fresh water for the hills and plains and are, therefore, considered 'water towers'. Erratic rainfall patterns means managing water is more challenging. Prolonged light rains help recharge groundwater but intense rainfall generates run off which leads to floods and landslides. Nepal also faces sedimentation problems. Widespread land degradation has reduced productivity. Hundreds of human lives and properties worth millions of rupees are lost every year to floods and landslides. As snowfall declines, springs and spring fed rivers show



An erosion prone landscape in the rain shadow part of the Himalayas near Yara

Photo: M. Chetri

reduced flows. Water scarcity is expected to increase in winter and in the dry season.

Conclusions and ways forward

Variations in precipitation patterns have impacts on various aspects of local life. People report that these impacts are both negative and positive. The much-discussed issue of glacial melt is not a big concern for local people; they are more concerned with the shifting precipitation patterns and reduction in snow deposits that provide water reserves for use in the summer. Inadequate scientific monitoring makes it difficult to validate the observed changes.

Climate change is recognized as a threat to communities in the highlands and plains who depend on mountain resources such as water. Surprisingly, many people feel positive about climatic changes and are hopeful about the future of the environment. They expect future winters to be less chilly and summers to be humid and warm. The thought of less harsh winters due to a decline in snowfall brings a smile to the faces of elderly people, although some of them also fear that reduced water supplies will be problematic. However, most people are unaware of the real consequences of global warming. Communities who are most vulnerable to the affects of climate change are generally unaware of the nature of possible impacts. They are, therefore, less able to cope with changing situations.

Water management is undoubtedly the main challenge regarding local responses to

climate change impacts. Reviving traditional practices and improving knowledge on how to harvest rainwater and snowfall provides one way of coping with this problem. Appropriate technologies, suitable for the local context, are also helpful. Before planning any interventions, a proper assessment of the impact of climate change on water resources is essential.

Empowering communities with information, technological skills, education and employment is the best way to address vulnerability. A sizable action research project is therefore necessary to identify and document climate change impacts. Planning mitigation measures should also be a priority.

Nepal demonstrates diverse geo-physical and climatic conditions within relatively small areas. It is, therefore, an ideal place to study climate change impacts on natural and socio-economic spheres. Such a study would contribute towards a better understanding of the intensity and impacts of global changes. The first step in such a study would be to start monitoring rainfall and temperatures at the community level. Mobilizing local schools and communities to monitor the weather using rain gauges and thermometers could fulfill the dual purpose of enhancing local scientific databases and raising the awareness of students and other people about the importance of monitoring the climate. ■

ABOUT THE AUTHOR



● **Ngamindra Dahal** trained as a hydro-meteorologist. He currently works as the Energy and Climate Change Coordinator at the King Mahendra Trust for Nature Conservation, a lead environmental non-governmental organization in Nepal.

CONTACT

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FURTHER INFORMATION

● **In the Cyberlibrary:** The Tiempo Climate Cyberlibrary lists websites covering mountains and climate at www.tiempocyberclimate.org/floor0/theme/t4445web.htm
● **On the Web:** For more information on the King Mahendra Trust for Nature Conservation, visit www.kmtnc.org.np

Rainwater harvesting

ITDG South Asia describes a rainwater harvesting project, designed to help people adapt to climate change in Sri Lanka and elsewhere

The Intermediate Technology Development Group (ITDG) South Asia began its rainwater harvesting pilot demonstration projects with financial assistance from the European Community and the Department of Agriculture in Sri Lanka. Support from the Fulmer Trust also allowed ITDG to strengthen its Livelihood Options for Disaster Risk Reduction (LODRR) Project by including work on rainwater harvesting. The LODRR project began in 2001 with assistance from the Conflict and Humanitarian Affairs Department of the Department for International Development in the United Kingdom. The LODRR project took a regional approach to the issue of disaster risk reduction. But at the individual country level, emphasis on implementing project components such as research, pilot demonstrations, capacity building and advocacy varied, depending on country needs.

Work on rainwater harvesting began in the Moneragala District of Sri Lanka. Pilot demonstration projects were then established in Usgala Village of Sooriyawewa Divisional Secretariat Division in Hambantota District, and in Mahameddawa Village in Nawagathethagama Divisional Secretariat Division in Puttalam District. All community participants were from economically marginalized sections of society. They had been subject to four or five seasons of crop failure resulting

MAIN POINTS

- **ITDG South Asia describes** how rainwater harvesting techniques were developed in Sri Lanka and elsewhere.
- **Such techniques** provide water for poor people for agricultural activities and

domestic use.

- **Rainwater harvesting** provides one way in which communities can adapt to droughts, which are likely to become increasingly common under climate change.

from bad climatic conditions. Drought was increasing in their areas. The unavailability of good quality water for drinking and other domestic purposes meant that diseases such as diarrhoea were common amongst community members.

The concept of rainwater harvesting

In Sri Lanka, drought occurs as a result of monsoon failure or reduced precipitation. Two thirds of Sri Lanka is categorized as a dry zone, and is prone to long dry spells and frequent droughts. Some parts of Sri Lanka's dry zone receive only 1000 to 1250 mm of rainfall per year. Most people in this area rely on irrigated paddy cultivation and subsistence farming, and drought affects the livelihoods of these people. An inability to store enough rainwater for use in the dry months means that many farmers have to survive with just one annual crop cycle. Water security is eroded and some villagers find themselves having



Run off rainwater harvesting tank

Photo: ITDG South Asia

to travel almost ten kilometres in search of potable water. Production decreases and incomes decline during drought periods. Project areas in other countries are also dry. For example, intervention areas in Pakistan have less than 400 mm of rainfall per year.

Rainwater harvesting is not a new idea for Sri Lankans – they have used the concept since ancient times. But modern rainwater harvesting technologies needed a ‘testing time’. This was mainly due to technical deficiencies and a lack of awareness about the operation and maintenance of rainwater harvesting tanks. Focus was placed on developing technologies to suit the local conditions and on creating awareness among village level practitioners about best operational and maintenance practices. As a result of continuous effort to develop appropriate technologies, and with assistance from various government and non-government institutions, ITDG and its partner organizations were able to

develop appropriate rainwater harvesting techniques.

In the past, many organizations built and promoted the use of underground tanks to harvest rainwater. But the proliferation of plant roots damaged the tanks making maintenance expensive. Promotion of the aboveground Ferro cement tanks used by the ITDG projects successfully solved this problem. Many other institutions promoted aboveground rainwater harvesting structures, but due to various deficiencies in their planning, construction and maintenance, most communities considered them less successful. As evidence of this success, the initiatives taken by Care International and World Vision (as well as many other local non-government organizations) using ITDG pilot demonstration projects for their educational programmes can be cited. The National Disaster Management Center also implemented a special programme to provide tiles for all villagers with roofs thatched with cadjan leaves in Usgala Village, so that villagers could practice rainwater harvesting. The second Water and Sanitation Project of Puttalam District also constructed 100 rainwater harvesting tanks for the villagers of Mahameddawa. This provided all village households with rainwater harvesting tanks for use in their own houses. This initiative was a direct result of information sharing and advocacy activities carried out by the ITDG project with the help of the relevant authorities.

Livelihood improvements

A rainwater harvesting tank with a capacity of 5000 litres allows people to harvest a minimum of 25,000 litres of water in a normal year. Households in Mahameddawa Village used this water for eight months during the drought period. Without this water, villagers could have suffered severe hardship, especially in a drought year like 2001 when they might have had to have walked two or three kilometres to fetch water. Ms Jayasingha of Mahameddawa Village stated that “thanks to rainwater harvesting tanks, now we can live with peace of mind. Even though we may not have anything to eat due to the drought, we know that we have at least good quality water at our doorstep to drink.”

With improvements introduced by ITDG, Sri Lanka now promotes the construction of aboveground Ferro cement tanks with a capacity of 7500 litres. Rainwater harvesting is also used to support village livelihood



Aboveground rainwater harvesting tank

Photo: ITDG South Asia

options based on agriculture. Simple drip irrigation systems are fitted to aboveground rainwater harvesting tanks. The pressure created from the water in the tank is all that is needed for irrigation – pumps and other mechanical devices used for drip irrigation elsewhere are not necessary. Drip irrigation supports the growth of crops for which there is a high market demand. Another simpler type of drip irrigation system – the bucket kit method – is also used to cultivate high value crops.

‘Run off rainwater harvesting’ is mainly used for agricultural purposes. This method collects free flowing groundwater in tanks with a capacity of 5000 to 12,000 litres. Some 30 to 35 perennial crops can then be grown in half an acre of land. To maximize the efficient use of available water, ‘pitcher (pot) irrigation’ is used coupled with mulching and other best agricultural practices.

A 7500 litre aboveground domestic water tank costs around 20,000 Rupees (about US\$200). A run off agricultural rainwater harvesting tank with a capacity of 10,000 litres will cost around 12,000 to 15,000 Rupees (US\$120 to US\$150), depending on whether or not construction materials are available locally. In all instances the community contributed around 45 to 50 per cent of the costs. ITDG and its partner organizations always emphasize the importance of community contributions, as this gives a sense of ownership to the project participants.

The approach

The technology itself is a package comprising ‘hardware’ and ‘software’. The ‘hardware’ includes the technology and the physical project components. The ‘software’ includes community mobilization, participatory development of the technology itself, and capacity building for the use of the technologies. The contribution and participation of communities is an important component of project sustainability. Giving training on the technology to the local masons and providing knowledge on the operation and maintenance of the technology to other community members enhances the quality of the water they will receive.

Large-scale replication

Replication of the project by other agencies started before the project was completed. Replication of the total approach and its various components was done by government agencies in Sri Lanka and Pakistan, international donors such as the Disaster Preparedness Programme of the European Commission Humanitarian Office – South Asia, and international non-governmental organizations such as the United Nations Development Programme, OXFAM Pakistan, Plan International Sri Lanka, and Care International Sri Lanka. ■

ABOUT THE AUTHORS

● **ITDG** is an international development agency with the vision “a world free of poverty and injustice in which technology is used to the benefit of all.” ITDG South Asia currently works in the areas of energy, transport, manufacturing, agro-processing, disaster mitigation and natural resource management.

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FURTHER INFORMATION

● **On the Web:** More information about ITDG can be obtained from the website: www.itdg.org

Lessons from the tsunami

NEWS

HEALTH CONFERENCE

Thailand hosted a conference during May 2005 to discuss the lessons learnt from the tsunami that devastated the nations of the Indian Ocean in December 2004.

The aim of the Conference on the Health Aspects of the Tsunami Disaster in Asia was to examine the lessons learnt from the health sector response to the crisis and the early phase of recovery. The conference, convened at senior policy and expert practitioner level, was organized by the World Health Organization (WHO).

In his opening address, WHO Director-General Lee Jong-wook reported that the tsunami had affected over ten countries in Asia and Africa and killed well over 200,000 people. "This heavy loss has made the world realize that something must be done to prepare ourselves for future disasters," he said. According to David Nabarro, special representative of the WHO Director-General for health action in crises, "the tsunami has shown that countries can prevent disease outbreaks but that

the world must be prepared to deal more effectively with psychological trauma, the health needs of women and mass fatalities. By applying what we have learned, we can be better prepared. When disaster strikes, more lives will be saved and affected communities will recover more rapidly."

Delegates at the conference identified the problems that had been experienced in responding to the Indian Ocean tsunami. One of the main issues discussed was how to manage more effectively the many offers of assistance in the immediate aftermath. The WHO reported that it had been hampered by having to find uses for offers of military assistance and by having to build working relationships and establish ground rules. Clear roles, responsibilities and operating procedures need to be sorted out ahead of any disaster.

The conference also concluded that uncoordinated needs assessments are counterproductive. "The coordination was inadequate," agreed Rear Admiral Robert Hufstader, Command Surgeon for the United States Pacific Command. "But the management of something this overwhelmingly complex

– 30 militaries, United Nations agencies and hundreds of non-governmental organizations – had never been attempted before," he continued.

Barbara Butcher, director of investigation for New York City, stressed the need for improved aid for the survivors. "Death is not the end of suffering. People left behind still suffer a great deal from the loss," she said. It was reported that up to ten per cent of the people affected by the tsunami, potentially half a million people, had mental health problems so severe that they required professional treatment. The conference called for simplified procedures and better guidance to improve the treatment of those suffering from psychological trauma and other forms of mental illness.

Participants also called for a greater focus on women's health. Women are particularly vulnerable in disasters and maternal, obstetric and gynaecological services should be given special priority.

Serious problems had been encountered in identifying bodies, with only 60 per cent of bodies found in Thailand identified at the time of the conference. The WHO will encour-



Tsunami damage in Sri Lanka

Photo: Sanjini De Silva

age health ministries to invest in forensic techniques and discourage mass burials because of the identification problems and the psychological damage that are created by this approach.

On the positive side, participants concluded that action taken at the earliest opportunity had prevented epidemics, despite the loss of water supplies and sanitation, and overcrowding in camps. A reporting system for disease outbreaks, and mobile protection teams, had contributed to this success. WHO publicity regarding health threats also

resulted in aid being given specifically to restore water supplies and sanitation.

The following areas for action were identified:

1. strengthening national capacity for risk management and vulnerability reduction;
2. improved information for post-disaster needs assessments and programme management;
3. guidance on best public health practice in vulnerability reduction and disaster response;

4. the need for benchmarks, standards and codes of practice;
5. better management and coordination of disaster responses;
6. capacity building in supply systems, communications and logistics;
7. the key role of voluntary bodies in preparedness and response;
8. donors and donorship principles;
9. the potential contribution of government military forces and the commercial private sector;
10. persons working within local, national and international media;
11. accountability and ethics; and,
12. developing capacity for disaster preparedness.

The conference ended with the WHO and other groups calling for a fundamental change in crisis response. "What we're proposing is radical. If we don't change things then more lives will be unnecessarily lost," said Mukesh Kapila, a senior WHO adviser. WHO officials have set an ambitious six-month deadline to reform WHO operations and the priorities of the national health ministries it supports.

● **Further information:**

Further information regarding the aims and outcome of the conference can be found on the conference website at www.who.int/hac/events/tsunamiconf/en/

Education, training and awareness

ARTICLE SIX WORKSHOPS

Valentin Bartra reports on several regional workshops on climate change education, training and public awareness.

Climate change issues have received much media coverage, and a captivating Hollywood film has even been made. But this has not been enough to mainstream the issue into public concerns. Article Six of the United Nations Framework Convention on Climate Change (UNFCCC) recognizes that education, training and public awareness are crucial to help achieve the ultimate goal of stabilizing atmospheric greenhouse gas levels.

The New Delhi Work Programme – a five-year focus on Article Six – was adopted at the eighth Conference of the Parties to the UNFCCC. Central to the Work Programme are regional workshops. These allow people to share experiences and disseminate good practice. They promote partnerships with all sectors of the economy and help develop better methods to evaluate the results. They aim to:

- develop country driven approaches;
- integrate Article Six activities into existing climate change programmes and strategies;
- promote regional partnerships;
- encourage programmatic responses by non-governmental organizations (NGOs) and inter-governmental organizations;
- identify activities that parties to the convention may wish to implement;
- enhance climate focused programmes on education and training;
- increase the availability and dissemination of climate change information; and,
- build active regional networks among a broad range of stakeholders.

Regional workshops have been held in Europe, Asia and Africa. The Montevideo, Latin America and Caribbean regional workshop was held from March 30 to April 1, 2005. Participants came from 23 countries and included national climate change officers, private sector practitioners, academia and the media. Presentations set the context and framework. Questions were allowed and a lively debate ensued. Participants chose from the following themes: public aware-

ness, communication, public access to information and public participation, and education and training. Discussions were held in both English and Spanish to accommodate participants from the Caribbean and Latin America. There was a general consensus on:

- the importance and value of Article Six regional workshops;
- the slow progress to date and the need to do much more;
- the inadequacy of available funding; and,
- the need to mainstream Article Six into other activities.

Implementing Article Six will help us care better for our planet. Regional workshops allow people to share experiences and disseminate good practice. They promote partnerships with all sectors of the economy and help develop methods to evaluate the results.

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Tiempo is published by: the International Institute for Environment and Development, the University of East Anglia and the Stockholm Environment Institute-York, with financial support from the Swedish International Development Cooperation Agency (Sida).

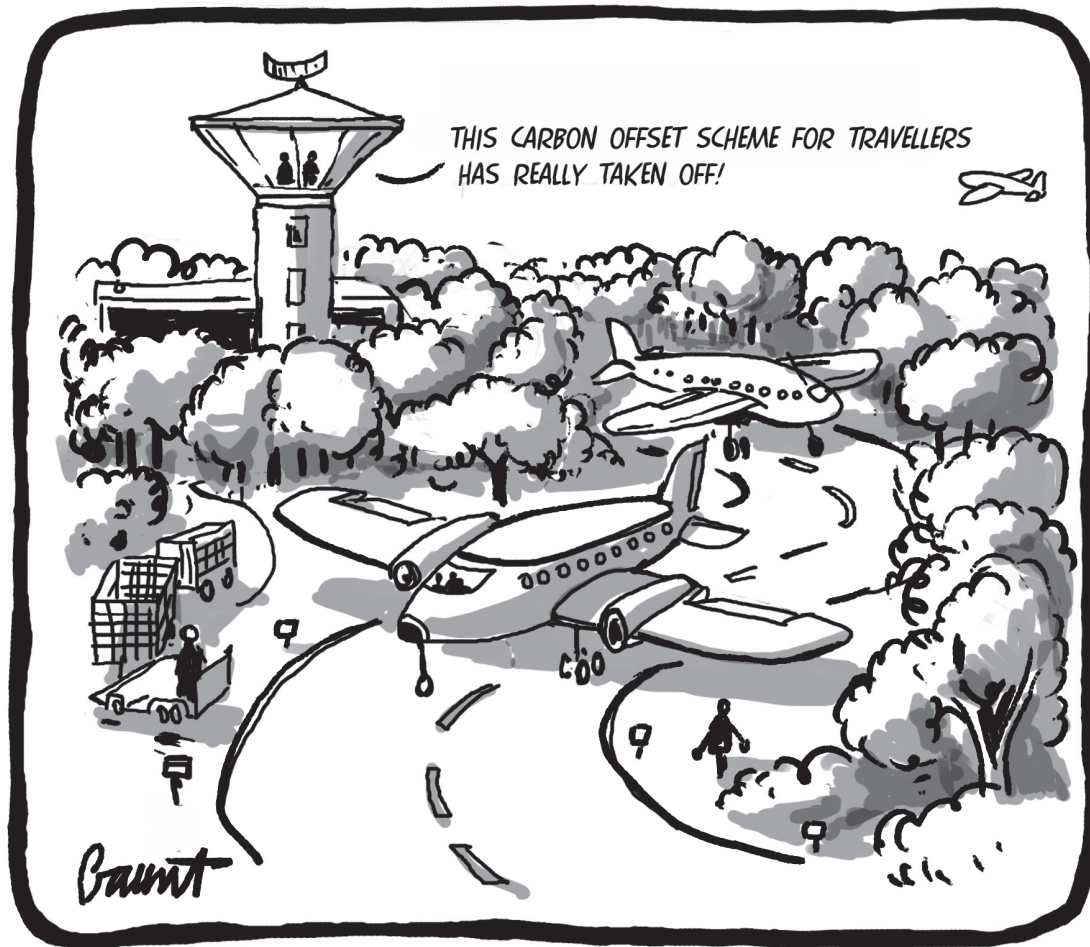
Production Manager:
Erik Willis

Layout: Lisetta Tripodi
Programme coordinator:

Johan Kuylenstierna

Design: A4

Printed by: PMS Marketing
Logistics, York



LDCs in the climate negotiations

Climate change is of vital importance to Bangladesh and many other developing countries including the Least Developed Countries (LDCs). Northern countries have polluted the most, but Southern countries are feeling the impacts of climate change. The Prime Minister of Bangladesh is deeply concerned. She emphasizes that it is a question of Northern lifestyles being threatened, but Southern lives. Bangladesh and the LDCs face many problems in the climate negotiations. The Group of 77 and China is composed of many different interests and groups. It includes big developing country players and also the Organization of Petroleum Exporting Countries (OPEC). The Association of Small Island States (AOSIS) is vocal, but more people live on river islands in Bangladesh than in all AOSIS countries combined.

Even with the Kyoto Protocol, global warming and climate change impacts will con-

tinue. We must, therefore, maintain pressure for mitigation measures and press the biggest polluters to reduce their greenhouse gas emissions. OPEC has linked the impact of burning fossil fuels and industry with the adaptation agenda. This makes progress slow. LDCs want to de-link these two issues.

THE FINAL WORD

Ambassador Sa-bihuddin Ahmed describes some of the challenges faced by the LDCs in the climate negotiations

We ask for adequate funds for the Special Climate Change Fund and the LDC Fund to help us meet adaptation needs. And we ask for capacity building and technology transfer for Clean Development Mechanism projects and adaptation measures. The connection between climate change and poverty needs emphasizing, especially for LDCs.

It can be hard to make our voices heard, but Bangladesh is quite vocal in the LDC Group. We have secured a special fund for drawing up National Adaptation Programmes of Action (NAPAs). We now need funding for projects identified in the NAPAs.

LDCs have limited resources. Finances are only available for one delegate per country

to attend negotiations, but we need more delegates because sometimes several groups meet simultaneously. At the Ninth Conference of the Parties (COP9), we included civil society members, including university teachers and scientists, as delegation members to improve negotiating capacity. Institutional memory is also a problem and continuity gets lost. Attending only one or two meetings is not enough to understand the complexity of the process and build up a rapport with other delegates.

LDCs suffer language problems, as most meetings are in English. Awareness at the policy level also needs to increase. LDCs could negotiate more forcefully if they could meet a few months ahead of every COP.



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