



UNFCCC SEMINAR ON THE DEVELOPMENT AND TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGIES FOR ADAPTATION TO CLIMATE CHANGE: 14-16 JUNE 2005

The UN Framework Convention on Climate Change (UNFCCC) seminar on the development and transfer of environmentally sound technologies for adaptation to climate change convened from 14-16 June 2005, at the Hilton Hotel in Tobago, Trinidad and Tobago. The seminar was convened following a request from the UNFCCC's Subsidiary Body for Scientific and Technological Advice (SBSTA) at its twentieth session in June 2004, for the UNFCCC Secretariat to organize a seminar on the development and transfer of environmentally sound technologies (ESTs) for adaptation to climate change, in order to discuss case studies encompassing short-, medium- and long-term examples of their application. The terms of reference for the seminar were prepared by the UNFCCC's Expert Group on Technology Transfer (EGTT) at its sixth meeting.

The seminar provided an opportunity for different experts to exchange views and experiences on a range of activities relating to ESTs for adaptation to climate change. Topics addressed included concepts, needs for, and identification and evaluation of, technologies for adaptation, experiences and lessons learned and possible next steps in developing, transferring and applying these technologies.

Fifty representatives of governments, intergovernmental and non-governmental organizations (NGOs), business and industry groups, and academic institutions attended the workshop. Plenary sessions on Tuesday, 14 June, and Wednesday, 15 June, provided an overview of the issue of development and transfer of ESTs for adaptation to climate change, explored on-going activities and possible synergies, and identified endogenous technologies for adaptation to climate change. On Wednesday afternoon and on Thursday, 16 June, participants convened in two parallel working groups to discuss technologies for adaptation in the context of the UNFCCC. The meeting concluded with a roundtable debate on ways forward.

Following the seminar's conclusion, a meeting of the EGTT was held to consider the seminar's outcome and prepare recommendations to SBSTA.

A BRIEF HISTORY OF THE UNFCCC AND TECHNOLOGY TRANSFER AND ADAPTATION

Climate change is considered to be one of the most serious threats to sustainable development, with adverse impacts expected on the environment, human health, food security, economic activity, natural resources, and physical infrastructure. Global climate varies naturally but scientists agree that rising concentrations of anthropogenically produced greenhouse gases in the Earth's atmosphere are leading to changes in the climate. According to the Intergovernmental Panel on Climate Change (IPCC), the effects of climate change have already been observed, and scientific findings indicate that precautionary and prompt action is necessary.

The international political response to climate change began with the adoption of the UNFCCC in 1992. The UNFCCC sets out a framework for action aimed at stabilizing atmospheric concentrations of greenhouse gases in order to avoid "dangerous anthropogenic interference" with the climate system. Controlled

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gases include methane, nitrous oxide and, in particular, carbon dioxide. The UNFCCC entered into force on 21 March 1994, and now has 189 Parties.

TECHNOLOGY TRANSFER: Technology transfer is considered a key element in combating climate change under the UNFCCC. Technology transfer activities have been on the agenda of every session of the SBSTA and the Conference of the Parties (COP) to the UNFCCC. UNFCCC Article 4.5, which addresses the need for technology transfer, states that “developed country Parties...shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention,” adding that “in this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties.”

At COP 7, held in November 2001 in Marrakesh, Morocco, Parties decided to establish an Expert Group on Technology Transfer (EGTT) to support the work of the SBSTA in advancing the Convention’s technology-related goals. Since 2002, the EGTT has met several times, adopting work programmes and providing input and advice to the SBSTA on technology transfer. During that time, the EGTT considered a variety of issues, focusing in particular on information dissemination, enabling environments for the transfer of environmentally-sound technologies, and technology needs assessments.

ADAPTATION: Adaptation is a cross-cutting theme of the UNFCCC and is referred to in different articles. In particular, Convention Article 4.1 states that Parties shall “formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to facilitate adequate adaptation to climate change,” and “cooperate in preparing for adaptation to the impacts of climate change.” Convention Article 4.4 states that developed country Parties shall “assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects.” While COP 1 in 1995 addressed funding for adaptation (decision 11/CP.1), it was not until the adoption of the Marrakesh Accords in 2001 that adaptation began to be more widely seen as a prominent area for action, as set out in decision 5/CP.7 (adverse effects of climate change). Among other things, the decision specifically highlights the need to support the promotion of transfer of adaptation technologies.

With decision 1/CP.10 (Buenos Aires Programme of Work on Adaptation and Response Measures), Parties reached a new milestone in terms of work on adaptation. The decision initiated a programme of work on adaptation (PWA), emphasizing technology transfer for adaptation on an urgent basis in priority sectors, and instructing SBSTA to develop a structured five-year programme of work encompassing a range of technology transfer issues. Work on this programme was initiated at SBSTA 22 in Bonn in May 2005. After an in-session workshop, numerous informal consultations and six contact group meetings, delegates at SBSTA 22 agreed to conclusions, which include a draft COP decision and draft annex on the SBSTA programme. However, SBSTA 22 did not finalize the programme, and the draft decision

and annex remain bracketed. The work programme will be further considered by SBSTA 23 in November/December 2005.

REPORT OF THE SEMINAR

Earl Nesbitt, Trinidad and Tobago’s Minister of Public Utilities and the Environment, opened the meeting on Tuesday, 14 June, and chaired the morning session. He drew attention to climate change and ESTs for adaptation in the context of sustainable development.

EGTT Chair Kishan Kumarsingh (Trinidad and Tobago) outlined the development of UNFCCC work on technology transfer and adaptation. He noted that identifying and implementing technologies for adaptation will involve methodologies such as vulnerability assessment and technical needs assessment (TNAs).

SBSTA Chair Abdullatif Salem Benrageb (Libya) emphasized the importance of adaptation and technologies for adaptation, in addition to the need for immediate action to mitigate climate change. He said that the seminar’s outcome will be considered by the EGTT and reviewed by SBSTA. He hoped the seminar would generate practical ideas that the EGTT could take up in its programme of work, including identifying next steps in developing, transferring, and applying technologies.

Janos Pasztor, UNFCCC Secretariat, said adaptation has always been a priority for developing countries. He said the seminar represents the first time a group is undertaking substantive work on adaptation. Pasztor said the EGTT would follow up on the meeting by producing technical papers and practical information, as well as selecting key ideas and turning them into concrete recommendations for the SBSTA and the COP.

Orville London, Chief Secretary of the Tobago House of Assembly, recognized the critical importance of the seminar in assisting decision makers in fostering sustainable development. Underlining Trinidad and Tobago’s vulnerability to floods and hurricanes, he stressed that his country and region have finally concluded that actions must be taken to mitigate climate change and to cope with disasters. He highlighted the need to enhance the synergies between financial resources and technical expertise in order to address climate change. He urged participants to reach recommendations for policy-making processes especially regarding floods, water resources and agricultural activities, and said the success of this seminar will depend on developing ways to disseminate its outcomes among as many decision makers as possible.

Penelope Beckles, Trinidad and Tobago’s Minister of Public Utilities and the Environment, stressed that small island developing States (SIDS) have already been suffering the negative impacts of climate change due to their geographical location, lack of technical and financial resources, and the vulnerability of their biodiversity to climate change. She expressed hope that the experiences shared in the seminar would further prepare participants to cope with disasters and adapt to climate change. Beckles noted climate changes that impose serious challenges in achieving sustainable development objectives are being detected in Tobago, such as: changes in the duration of seasons; loss of agricultural land; and changes in water availability. Noting the need to increase the research on



technology for adaptation, Beckles highlighted the importance of promoting technology transfer within the UNFCCC process. She welcomed activities on the ground that transfer technology to developing countries. Beckles acknowledged the importance of partnerships to promote sustainable development in SIDS, and noted some activities carried out by her country to mitigate greenhouse gas emissions, including: increasing forest cover; using alternative fuel and new technology with lower greenhouse gas emissions; and moving towards cleaner production technology and energy efficiency practices.

SETTING THE SCENE

Following the seminar's opening on Tuesday morning, participants heard overview presentations and discussed expectations for the seminar. The session was chaired by Kishan Kumarsingh.

BACKGROUND AND CONTEXT: Wanna Tanunchaiwatana, UNFCCC Secretariat, presented the background and context for the seminar. She noted that adaptation is a cross-cutting activity under the UNFCCC, and is being addressed by the Subsidiary Body for Implementation (SBI) as well as by SBSTA. She noted that COP 10 requested SBSTA to develop a five-year structured programme of work on scientific and technical and socioeconomic aspects of the impacts of, and vulnerability and adaptation to, climate change (referred to as the PWA). She asked delegates to consider: what practical next steps would be to promote the development and transfer of ESTs for adaptation to climate change; what possible contributions this seminar could make for the development of the PWA; how the PWA could support the work of the EGTT; and what the seminar's key message to the SBSTA should be.

Florin Vladu, UNFCCC Secretariat, gave an overview of technologies for adaptation to climate change in the UNFCCC process. He said that defining adaptation technologies in the context of climate change is difficult, and suggested that an operational definition might be "the application of technology in order to reduce the vulnerability, or enhance the resilience, of a natural or human system to the impacts of climate change." Vladu noted that technological approaches to adaptation include both "hard" technologies such as capital goods and hardware, as well as "soft" technologies such as knowledge of methods and techniques, which enable "hard" technologies to be applied. Stressing that the benefits might be too far in the future and local uncertainties too numerous to justify large investments solely for climate change, he suggested that investments should begin with present-day needs that are further justified by consideration of climate change.

Richard Klein, Potsdam Institute for Climate Impact Research, Germany, and UNFCCC consultant, presented the seminar background paper on applications of ESTs for adaptation to climate change. He noted that the paper provides an overview of concepts, challenges, experiences and lessons learned in developing, transferring and applying ESTs for adaptation. He highlighted some issues outlined in the draft paper, including: concepts and definitions of adaptation to climate change; implications for developing and transferring technology; and policy issues. Klein noted that adaptation measures include: increasing robustness of infrastructural designs and long-term investments; increasing flexibility of vulnerable managed

systems; enhancing adaptability of vulnerable natural systems; reversing trends that increase vulnerability; and improving societal awareness and preparedness. Klein stressed the importance of adaptation, noting that: climate change cannot be totally avoided; anticipatory adaptation (adjustments prior to the manifestation of impacts based on the expectation of changes) is more effective and less costly than emergency measures; climate change may be more rapid and pronounced than currently suggested; and immediate benefits can be gained from better adaptation to climate variability and extreme events. He highlighted that adaptation processes should include: raising awareness; planning design, policy criteria and development objectives; implementing activities; and monitoring outcomes. Klein underscored some factors that determine adaptive capacity of human systems, including the level of economic wealth, access to technology, information, knowledge and skills, and existence of institutions, infrastructure and social capital.

SEMINAR EXPECTATIONS: A number of participants presented comments and inputs regarding seminar expectations. Canada stressed the importance of institutional changes for successful implementation of adaptation technologies. She hoped for a wide discussion on technology and adaptation measures, impacts that technology changes may have in communities, and successful applications of adaptation technologies. Barbados expected participants to discuss the importance of financial resources for transferring adaptation technology and ways to strengthen institutions and promote cooperation among developing countries. Ghana said its expectations focused on identifying technologies that can promote climate change mitigation and adaptation activities. Japan urged discussion on improving TNAs, exchanging and disseminating information on existing technologies for adaptation measures, and mainstreaming adaptation and sustainable development policies at national levels. Noting that his country faces numerous challenges for adaptation to climate change, China highlighted the need for coordinating the design and implementation of measures to promote technology transfer, which could include defining concepts, raising information awareness, enhancing early warning systems and models, building human capacity, and identifying priorities for adaptation.

Discussion: Several developing countries highlighted the need for: focusing on the means to transfer technology from developed countries to developing countries; providing concrete examples of transferring adaptation technology; promoting stakeholder participation; and defining technological needs for adaptation in national assessments. Several developed countries underscored the importance of: assessing practical next steps to promote technology transfer; analyzing the means for disseminating useful and available technology information to countries that need technologies; exploring synergies between adaptation and mitigation technologies; and enhancing the capacity of countries that need technologies.

One participant underscored the need to establish ways to communicate the implementation of adaptation measures and risk reduction to insurance companies in order to see these actions reflected in insurance premiums and conditions. A participant expressed concern about ways to capture and apply indigenous knowledge regarding adaptation measures.



ENVIRONMENTALLY SOUND TECHNOLOGIES FOR ADAPTATION TO CLIMATE CHANGE

Participants heard presentations on technology needs on Tuesday afternoon, and on identification and evaluation of technologies on Wednesday morning. The session was chaired by Kishan Kumarsingh.

METHODOLOGIES FOR TECHNICAL NEEDS

ASSESSMENTS: Yamil Bonduki, United Nations Development Programme (UNDP), presented the UNDP handbook for conducting TNAs and preliminary results of UNDP analysis of TNA reports. He said the TNA handbook provides a framework to conduct a TNA from a climate change and development perspective. He pointed out that while TNA for mitigation is fairly straightforward, TNA for adaptation is more complex and challenging. He identified several issues in the identification of technology needs for adaptation, including:

- emphasis on the most vulnerable sectors and areas;
- wide stakeholder involvement;
- linkages with other national priorities;
- identification of hard and soft technologies;
- the extent of sector-specific vulnerabilities or hazards;
- the adaptive capacities of vulnerable sectors and populations;
- the risks of implementing maladaptation options; and
- the potential of soft technologies to build resilience.

He presented a preliminary analysis of 14 TNA reports. Noting that most countries adopted a sectoral approach for TNAs, he outlined criteria for prioritization of options and the share of adaptation and mitigation options by sector. He said that lessons learned from this process include: development is the biggest priority for countries; capacity building and government and stakeholder involvement are important; cross-sectoral issues should be addressed, including linkages between mitigation and adaptation priorities; and cost is one of the highest barriers in technology transfer.

Mahendra Kumar, United Nations Environment Programme (UNEP), presented experiences and lessons learned from TNAs conducted by UNEP. He presented the adaptation and mitigation technology needs examined by sector, noting that for some sectors (e.g., energy) almost all countries looked at both adaptation and mitigation, while for others (e.g., coastal zones) countries looked only at adaptation. He outlined the needed technologies, criteria for technology selection, and barriers to adaptation identified by TNAs for various sectors: coastal zones, energy, forestry and land use, industry, transport, waste management, and water resources. He said many countries identified tools, such as Geographic Information Systems (GIS) and tide gauges, rather than technologies, and noted the need to more clearly define adaptation technology. He stressed the need to increase capacity, particularly in the area of science and technology, and to strengthen linkages to policy.

Chair Kumarsingh outlined the draft framework of the modified TNA, which includes the need for countries to:

- identify and prioritize vulnerable sectors;
- identify specific characteristics of prioritized sectors;
- compile a list of response or adaptation measures that can be implemented to address the specific vulnerability issues;
- elaborate a prioritized list of practicable options;

- identify technologies that can aid in addressing practical options;
- identify applicable technologies and capacity-building needs to use such technologies; and
- compile a report.

He noted that the TNA methodology regarding environmental technology impact assessment should: examine the reason for the proposed technology; describe the chosen technologies; carry out alternative analysis for the chosen technologies; examine technologies' longevity; and promote stakeholder participation.

Elmer Holt, Climate Technology Initiative (CTI), highlighted CTI experiences in supporting TNA development. He noted that CTI aims to foster rapid development of climate technologies and to support the EGTT's activities. He noted that TNA is not an "academic exercise" and needs to be implemented. Holt said that the UNFCCC's Technology Transfer Clearing House (TT:Clear) shows some TNA results and provides opportunity for possible "matchmaking" between countries' interests regarding technology transfer. Holt said existing TNA methodology guidelines need to be reviewed, and implementation of TNAs must be enhanced.

Discussion: In the ensuing discussion, participants highlighted a number of issues, including: the voluntary basis for submitting TNAs to the Secretariat; the importance of national development policies to inform the elaboration of TNAs; the synergies between Least Developed Countries' (LDC) National Adaptation Programme of Actions (NAPAs) and TNAs to implement climate change measures; and TNA limitations regarding ways to identify technologies that can be adjusted to national circumstances.

NEEDS FOR TECHNOLOGIES: Florin Vladu presented needs for adaptation technologies as expressed in TNAs, national communications and other national reports, summarizing results from the Annex I Parties' third national communications. He gave examples of initiatives in water resources, forestry, agriculture, human health, fisheries, and infrastructure and service sectors, as well as projects conducted with bilateral assistance. He cited examples of bilateral projects focused on vulnerability assessment, disaster preparedness and risk management, integrated water management, prevention of desertification, and support of meteorological networks. In national communications for non-Annex I Parties, he noted that main vulnerable sectors identified were: agriculture and food security; water resources; coastal zones and marine ecosystems; terrestrial ecosystems and forests; and human health.

Virginia Sena, Uruguay's Ministry of Housing, Territorial Regulation and Environment, outlined identification of adaptation measures and related technologies in Uruguay's second national communication. Sena said that Uruguay developed a programme of general measures for mitigation and adaptation, with a main objective to identify greenhouse gas reduction measures and facilitate adaptation. She noted that the programme includes vulnerability analysis, and a summary of identified adaptation measures for agriculture, biodiversity, coastal resources, water resources, fishery resources, and human health. Sena underscored the programme also includes cross-sectoral measures oriented to: institutional strengthening on climate change matters; development of a programme on



climate change information dissemination, public awareness and education; improvement of capacity for development and transfer of ecologically rational technologies; and promotion of research and systematic observation.

Rasack Nayamuth, Mauritius Sugar Industry, presented summarized vulnerability and adaptation assessments for agriculture, water resources, coastal zone, forests and other land use, health, and fisheries in his country. Nayamuth stressed that agriculture, particularly sugarcane, as well as water resources were identified as highly vulnerable sectors. Summarizing the process and methodologies used in developing Mauritius' TNA, he noted that difficulties included inadequate capacity, limited response from stakeholders, and the need for resources.

Yamil Bonduki outlined the UNDP Adaptation Policy Framework (APF), and said the APF is a flexible structured approach that treats adaptation technologies as coherent packages of "soft" and "hard" responses. He highlighted the APF project design, which involves: assessing current vulnerability; characterizing future climate risks; developing adaptation strategies; and continuing the adaptation process. Bonduki said that the adaptation learning mechanism (ALM) aims at maximizing global learning and contributing to the incorporation of adaptation strategies into development planning. He underscored that the UNDP/Global Environment Facility (GEF) adaptation strategy includes four phases, namely methodology improvement and dissemination, regional assessments, national assessments, and implementation.

Discussion: Participants addressed issues, including:

- the limitation of technology options available;
- the challenges of implementing TNAs;
- ways to identify and prioritize technologies under the climate change framework;
- the use of the APF to select adaptation projects at country level; and
- ways to access funding windows within the GEF for projects under the Convention.

One participant underscored the need to start elaborating the national development policy before carrying out TNAs. A participant asked if ALM includes issues regarding disaster prevention, and Bonduki responded that it does.

IDENTIFICATION AND EVALUATION OF TECHNOLOGIES FOR ADAPTATION TO CLIMATE CHANGE

EGTT Vice-Chair Bernard Mazijn (Belgium) chaired the session on Wednesday morning.

Anthony Nyong, University of Jos, Nigeria, presented results from a vulnerability project in the West African Sahel. He said the main vulnerabilities of the population in this region stem from either water or agriculture issues. Noting that climate variability, rather than climate change, is an ever-present regional concern, he said that coping with present-day variability would go a long way down the road towards adapting for climate change. On adaptation, he pointed out that households have been implementing different adaptation technologies for many years, and that many decisions on adaptation are taken at the community level through farm associations. Using participant-identified indicators of success, he said that water harvesting technology is one of the most desired technologies. Nyong

concluded that local knowledge is a major underutilized resource in adaptation, and that development efforts should be applied with an understanding of, and sensitivity to, local communities.

Richard Klein spoke on technology for adaptation to climate change in coastal zones. He noted that coastal zones are among the environments under most stress, yet offer significant opportunities for economic development. He observed that first-order effects of climate change on coastal zones include: sea-level rise; increases in seawater temperature; increased precipitation intensity; changes in wave climate, storm frequency, and river runoff; and increased ecosystem productivity due to increasing atmospheric carbon dioxide. Focusing on sea-level rise, Klein noted that the number of impacts assessed in vulnerability studies is very limited. He observed that even stringent mitigation measures would have limited impacts on the number of people at risk from floods, because of lag times in the atmosphere and ocean systems. Klein noted the existence of several tools and strategies for information, planning and implementation, and said there is a need for consultation and coordination with stakeholders in coastal zone management.

Francis Agyemang-Yeboah, School of Medical Science, Ghana, noted the distribution and abundance of disease vector organisms and intermediate hosts are affected by changes in both physical and biological factors in the ecosystem. He presented a case study from Ghana combining air temperature and humidity projections with distribution of diseases. He concluded that periods of high meningitis, diarrhea and malaria cases coincide with periods of high maximum air temperature. Agyemang-Yeboah said the socioeconomic impacts of such diseases include reduced income of affected individuals due to loss of productivity. He suggested some health adaptation strategies and identified technologies for preventing and curing diseases. For malaria, Agyemang-Yeboah suggested the development of vaccines, herbal preparations, insecticide, impregnated nets and combined therapy. For cerebrospinal meningitis, he suggested altered house designs, early vaccination initiatives, mobile clinics and health education. For cholera, he suggested the use of bole-hole drills for capturing water, the employment of activated charcoal domestic water filtration systems, and the establishment of locations for disease screening and medical care. For coping with climate change and health issues, Agyemang-Yeboah underscored the need for socioeconomic adaptation, capacity-building initiatives, coordinated health policies, evaluation and monitoring, strong institutions, cost-effective technologies, and financial resources.

Ian Burton, Independent Consultant, Canada, stressed the importance of motivating individuals to spread adaptation technology, especially related to extreme events. He noted that with regard to infrastructure and adaptation requirements, developers have an apparent preference for more exposed or dangerous locations, which can have particular economic benefits. For coping with extreme climate events, Burton suggested: revision of civil construction codes and standards taking into account weather extremes; raising stakeholders' awareness of climate change impacts; providing advice on ways to incorporate climate change into stakeholders' decision-making processes; developing insurance products through the private insurance industry; and lowering insurance premiums for areas where adaptation measures have been implemented.



Abhayasingha Bandara, Sri Lanka's Department of Meteorology, addressed the issue of adaptation to increased thunderstorm hazards among low-income families. Noting a variety of lightning risks to human lives and concrete constructions, he said providing "earth terminal" installations is necessary for avoiding accidents and damages. Bandara stressed that in his country the practice of building houses with aluminum roofs on mountaintops and without earth terminals attracts lightning, causing losses of human lives and damage to properties. He suggested that precautionary steps be considered during construction, such as low-cost lightning rod technologies.

Discussion: On water resources and agriculture in West Africa, one participant asked whether the technologies studied were autonomously adopted or introduced. Nyong responded that many technologies were introduced, and that most were natural resource management technologies introduced after the 1972 drought. In response to a question on the role of policies, Nyong clarified that he had assessed the impact of both national and state-level policies on adaptation in the region.

On coastal zones, a participant noted that severe weather events such as tropical cyclones are a significant problem.

On climate change and human health, one participant underlined the linkages between water system storage and diseases. Another suggested analyzing the connections between malnutrition and the spread of diseases in the Ghana case study. Agyemang-Yeboah said that there is need for adaptive responses for malnutrition related to climate change, such as that caused by drought and loss of agricultural land. One participant highlighted the need for technology to identify and prevent the spread of diseases at an early stage, and Agyemang-Yeboah agreed these technologies would be useful.

On insurance, a participant raised the issue of reinsurance, and Burton clarified that reinsurance companies are currently addressing the question of catastrophic losses. Another participant noted the need for public sector involvement, particularly in areas of extreme high risk. A participant noted that insured parties should be partners in reducing risk. Pasztor pointed out that two workshops on insurance have been conducted under the Convention.

Responding to a question of whether climate change is a quantifiable risk factor, Burton clarified that though it is not precisely quantifiable, it could be taken into account in decision-making using expert judgment. One participant noted that strategic partnerships with professional organizations could be useful, and another said that focusing on property losses ignores more significant human losses in developing countries. Burton agreed, but noted that human losses in disasters are decreasing as a result of better early warning and evacuation systems.

ONGOING ACTIVITIES AND POSSIBLE SYNERGY

FINANCING THE TRANSFER OF TECHNOLOGIES FOR ADAPTATION TO CLIMATE CHANGE:

On Wednesday morning, delegates heard presentations and discussed opportunities for financing the transfer of technologies for adaptation. Abdullatif Salem Benrageb chaired the session.

Daniele Violetti, UNFCCC Secretariat, presented an overview of trends in financial flows and ongoing work on innovative financing for the development and transfer of technology. On funding targeted to climate change, he noted that funding

is available from: bilateral activities of Parties; multilateral activities such as the GEF, the World Bank or regional banks; the Special Climate Change Fund (SCCF); the LDC Fund (LDCF); financial flows generated by Joint Implementation/Clean Development Mechanism projects; and private sector investments. He surveyed funding flows outside the Convention, noting the increasing role of the private sector in funding provision. Violetti pointed out that a workshop on innovative financing was held in Montreal from 25-27 September 2004, and summarized its conclusions in the areas of TNAs, toolkits and handbooks, training and capacity building, enabling environments, risk management, dialogue, the role of financing, and adaptation. He noted that a follow-up workshop will be organized in October 2005.

Bonizella Biagini, GEF, presented financing provisions for adaptation technologies under the Convention. She outlined the role of the GEF in providing financing, and gave an overview of funds available for adaptation activities. For implementation activities, she noted that four programmes are available: the Strategic Priority on Adaptation (SPA) trust fund; the LDCF; the SCCF; and the Adaptation Fund under the Kyoto Protocol. Noting that the SPA projects are designed to "show how adaptation planning and assessment can be practically translated into projects that will provide real benefits," she summarized SPA projects in process in Kiribati, Colombia, the Caribbean, and Africa. She clarified that while the SPA funds the incremental costs of projects that have global benefits, LDCF and SCCF fund the additional cost of adaptation measures that are not required to include global benefits. While the LDCF funds projects for LDCs' urgent and immediate needs as identified in NAPAs, SCCF funds projects in priority areas of intervention with a longer-term approach and strategy. She noted that the top priority area of the SCCF is adaptation, and that its second priority area is technology transfer.

Discussion: In the ensuing discussion, participants addressed opportunities for financing the transfer of adaptation technology. One participant asked why innovative finance is needed, and what types of capacity building initiatives are needed for financing. Violetti responded that the Secretariat is looking at both innovative and conventional financing opportunities, and that capacity-building activities are needed for Parties to understand the functions of financing and ways to apply them. One participant underscored the need for financial resources that could be used for private technologies. Several participants asked how the GEF defines and measures "global benefits." Biagini answered that a full definition of "global benefits" is available on the GEF website, and highlighted the importance of this criterion for GEF accountability. Another participant underscored the need to finance initiatives on capacity building, partnerships and information sharing.

LESSONS LEARNED AND POSSIBLE SYNERGY

WITH ONGOING ACTIVITIES: Markus Lehmann, Convention on Biological Diversity (CBD), summarized the CBD objectives: conservation of biodiversity; sustainable use of its components; and fair and equitable sharing of the benefits arising from the utilization of genetic resources. He noted that CBD Parties are to provide and facilitate access to and transfer of technologies that are relevant to the CBD objectives. Lehmann



stressed that, under the CBD, access to genetic resources can be granted in exchange for access to, and transfer of, technology that makes use of those genetic resources. He stressed that transfer of technology in the CBD includes technology protected by intellectual property rights and must be implemented in accordance with international law. He noted the CBD programme of work includes elements related to technology assessments, information systems, enabling environments and capacity building. Lehmann noted that sets of technology for both biodiversity and climate change are difficult to define, and said there are opportunities for sharing experiences and good practices and cooperating to minimize trade-offs.

Ian Noble, World Bank, said the World Bank is concerned about climate change because the poor will face the greatest challenges from its consequences. He stressed that two billion people in developing countries were affected by climate-related disasters in the 1990s, and 2% of World Bank funds are diverted to disaster relief. Noble said that while climate change is a very minor factor in the Bank's development decision-making processes, it is becoming more relevant to project planning, and climate variability is already a major impediment to development. Noble noted that funds for mitigation and adaptation under climate change are limited and must be used effectively. He presented a screening tool under development by the World Bank that allows anyone to view models and find out whether a specific project will need to take into account climate change factors.

Taka Hiraishi, UNFCCC's Consultative Group of Experts on non-Annex I national communications (CGE), presented an overview of CGE work relevant to vulnerability and adaptation. He summarized extracts from national communications of non-Annex I Parties on the subject of vulnerability and adaptation. He also highlighted results and recommendations from a hands-on training workshop, held in Maputo, Mozambique, from 18-22 April 2005. Hiraishi said 40 hours of training were provided for 55 participants, during which modeling software and tools for vulnerability and adaptation assessments were used.

Discussion: One participant pointed to inconsistencies between transfer of technology in the CBD and the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). Lehmann clarified that the relationship between CBD provisions and the TRIPS agreement are controversial, and that no consensus exists among Parties. He further noted that Parties are encouraged to cooperate on these issues. One participant noted the need to consider conflict areas when protecting biodiversity. Responding to a question about implementation of national biodiversity action plans prepared for the CBD, Lehmann said that implementation will depend on each country's access to funding.

Several participants asked whether there are obligations to take climate change issues into account when elaborating projects for the World Bank. Noble responded that this is not the case. A number of participants requested clarification on access to the World Bank screening tool. Noble said the model will be freely available on the World Bank website when completed, and offered a prototype version to participants willing to test it.

ENDOGENOUS TECHNOLOGIES FOR ADAPTATION TO CLIMATE CHANGE

On Wednesday afternoon, participants heard presentations on endogenous technologies for adaptation to climate change. The session was chaired by William Agyemang-Bonsu (Ghana).

Mozaharul Alam, Bangladesh Centre for Advanced Studies, presented an overview of endogenous technologies for adaptation to climate change in Bangladesh. Noting that hazards in Bangladesh include floods, storm surges, droughts, and increasing salinity, he gave examples of technologies existing in Bangladesh to reduce risk. On floods and storm surges, he noted structural measures such as multipurpose cyclone centers, and non-structural measures such as sub-surface food and seed storage. On wetlands, he mentioned a floating agriculture technique called *baira*, traditionally practiced in southern districts but recently introduced in other wetland areas through environment and development projects. He enumerated coping strategies, such as polyculture, rainwater harvesting, migration, and afforestation. He said a main lesson was that endogenous technology for adaptation is context-specific, and that challenges include the need to understand communities and ecosystems and the functionality of these technologies under the additional stress of climate change.

LDC Expert Group Chair Paul Desanker (Malawi) spoke about adaptation technologies in NAPAs. He gave an overview of the NAPA process, and provided examples of adaptation needs identified by NAPAs and associated applicable technology, including improving yields through irrigation and changes in crops or tree types. He noted that some early examples of project results emerging from NAPAs are: early warning systems; seasonal forecasts; agricultural technology; GIS and Remote Sensing analysis; and integrated modeling and planning. Desanker mentioned that the most critical constraint is likely to be funding for technology. He said that an online database of adaptation solutions is planned to share local knowledge and endogenous adaptation techniques.

Discussion: In the ensuing discussion, one participant highlighted the complexity of managing an integrated assessment that combines numerous elements.

Answering a question on regional cooperation and transfer of technology, Alam said that at the moment there is no cooperation regarding the issue. He reiterated that endogenous technologies are context-specific. A participant asked how to successfully introduce endogenous technologies in other countries, and Desanker underscored that this will depend on a continued learning process.

WORKING GROUPS' DISCUSSION ON TECHNOLOGIES FOR ADAPTATION IN THE CONTEXT OF THE UNFCCC

On Thursday morning, participants convened in two separate working groups in order to facilitate discussion in smaller groups. The groups addressed the lessons learned from the seminar, information needs and processes, and ways forward on technologies for adaptation, focused on five detailed questions provided by the Secretariat. Working Group I (WG-I) was chaired by Holt and Working Group II (WG-II) was chaired by Rawleston Moore (Barbados). Participants' discussions in the working groups were reported to the plenary and are to provide inputs and contribute to the final report of the workshop.



What were the key lessons you received from this seminar? Were your expectations met?

Participants in WG-I mentioned numerous lessons learned from the seminar, including: the importance of synergies and the value of sharing country experiences; awareness of the tools available for identifying technology; and the role of technologies for adaptation in different sectors, such as water and health. Several participants suggested general insights, such as:

- the need for additional outreach efforts to increase awareness of climate change and adaptation issues;
- the importance of integrating adaptation into overall development planning;
- the need for focused efforts to implement technologies for adaptation;
- the need to disseminate the results of TNAs and NAPAs; and
- the importance of involving the private sector.

One participant noted that country experiences demonstrate the importance of a bottom-up approach, while another added that top-down approaches can also be useful. A number of participants said that further understanding of the cross-cutting nature of mitigation and adaptation is necessary.

In WG-II, numerous participants said their expectations were met. A few participants highlighted the limitations of actions that can be taken in their countries, and suggested that the next seminar include more case studies on adaptation technologies. A participant underscored that identifying existing technologies and adjusting them to the country level should be considered before transferring technology. Participants highlighted the need to: promote more south-south cooperation and more discussion on adaptation technologies and practices; link technologies for adaptation with development goals; and hold further discussion on the practical exchange of information including maladaptation issues.

Would access to information on country experiences with technologies for adaptation be useful? If so, in what form should this information be presented, and what support is necessary to be able to utilize this information?

While most participants in WG-I agreed that information on country experiences would be useful, some questioned whether a guide would be necessary. Participants noted that there is a need to make sure information is useful, and several raised concern about whether countries have the capacity to use this information. Participants suggested that an additional workshop for SIDS on technology for vulnerability and adaptation would be helpful. Participants also suggested that information targeted to media and politicians was important.

In WG-II, participants considered access to information vital for transfer of technology, and suggested establishing an adaptation chat room, network or teleconference to share information relating to country experiences on adaptation and technologies. Some participants highlighted that the internet is not widely available in their regions, and underscored the need to develop other ways to promote access to successful experiences on transfer of technology. Another participant suggested elaborating a compendium to be available in CD-ROM format and the internet, including background information on the development of these technologies, experiences in their application, and best practices. Participants

suggested having an adaptation technology fair to disseminate information, inviting the private sector to demonstrate new technologies to country representatives.

How might the outcomes from assessments relating to technologies for adaptation be structured to enhance their prospects for financing? What steps might be taken to help facilitate a market-based supply of technologies for adaptation?

WG-I participants noted the need for further work on guidance and for support on structuring proposals, and suggested that a standardized template would be useful. One participant noted that it would be useful to have guidance on how to cope with climate change as opposed to climate variability, in order to meet Convention and financing criteria. Other suggestions raised by participants included the need for: methodologies for measuring success; better coordination between agencies and countries on agendas; engaging the private sector; and using the results of TNAs and NAPAs.

In WG-II, one participant underscored the challenge of quantifying adaptation costs, and the need to identify such costs and integrate them into development plans. Another suggested carrying out a cost-benefit analysis for each project that is implemented in order to generate data on adaptation opportunity costs. A participant suggested inviting financing experts to participate in the next seminar in order to identify financing prospects. Participants also highlighted the need to: identify innovative financing packages to facilitate the transfer of adaptation technologies; engage the insurance industry in adaptation discussions; and identify specific private sector stakeholders to be involved.

What synergies within the Convention and other MEAs might be pursued to enhance the work on technologies for adaptation?

WG-I participants noted the need to take advantage of synergies, and mentioned in particular the need to coordinate the work of the expert groups. Participants also noted possibilities for coordination with the GEF, CBD, the TRIPS agreement, and the International Monetary Fund. Though some participants underscored the need to coordinate strategies for adaptation and mitigation, one participant noted that the two are separate issues and did not want to see synergies in this area.

WG-II participants recognized that the ongoing cooperation and information sharing between expert groups established under the Convention has proven to be very useful and should continue. Several participants also suggested inviting representatives from other conventions, such as the UN Convention to Combat Desertification and the CBD to take part in adaptation discussions. A participant suggested identifying specific fields in which synergies can be enhanced.

SBSTA is developing a five-year structured programme of work built around the following issues: methodologies, data and modeling; vulnerability assessments; adaptation planning, measures and actions; and integration into sustainable development. Given these four themes, what messages coming from this seminar would you deem important that might be considered for inclusion in this programme of work on adaptation?

WG-I participants noted that research and development on



technologies for adaptation should be noted in the PWA. Another noted the need for synergies between mitigation and adaptation, while another said that coordination rather than synergies were important. Some cautioned that the PWA should take advantage of work done already and not develop a completely parallel process.

WG-II participants suggested: ensuring that efforts aimed at addressing technologies for adaptation contributes to meet sustainable development objectives; promoting awareness-raising and information-sharing initiatives; and integrating adaptation and mitigation activities.

CLOSING SESSION

Moussa Sanon, Department of Management of Natural Resources, Burkina Faso, presented a case study on transfer of technology and capacity building for coping with climate variability. He noted that experts focused their work on cotton and cattle ranching, carried out guided discussions with stakeholders, and highlighted the importance of: restoring and improving soil fertility; increasing collection of rainwater; strengthening capacities with field demonstrations; and improving irrigation efficiency. Sanon said the case study launched a workshop to foster effective stakeholder participation, information-sharing and awareness-raising. He concluded that successful technology transfer projects need to: involve stakeholders from the beginning of a project; elaborate inventories on techniques and constraints; apply a variety of technologies rather than isolated ones; and strengthen capacities.

Wanna Tanunchaiwatana said the seminar will contribute to the EGTT task of preparing a report on adaptation for SBSTA's consideration by the twenty-third sessions of the subsidiary bodies (SB 23).

SBSTA Chair Benrageb commended participants for their hard work and commitment during the seminar and thanked the government of Trinidad and Tobago and the UNFCCC Secretariat. He highlighted that the seminar provided useful ideas for the elaboration of SBSTA work on adaptation issues. He noted some challenges ahead, including: defining global benefits; sharing more experiences; exploring innovative finance to complement existing financial mechanisms under the Convention; increasing partnerships with the private sector; enhancing synergies with other MEAs; fostering capacity building; and combining adaptation with mitigation activities.

Sheriff Faizool, Deputy Permanent Secretary, Trinidad and Tobago's Ministry of Public Utilities and the Environment, said the seminar produced excellent results and expressed hope that participants will be able to use such results to make changes in their own countries regarding adaptation.

EGTT Chair Kumarsingh closed the meeting at 12:43 pm.

UPCOMING MEETINGS

EXTRAORDINARY MEETING OF PARTIES TO THE MONTREAL PROTOCOL/ TWENTY-FIFTH MEETING OF THE OPEN-ENDED WORKING GROUP:

These meetings are scheduled from 27 June to 1 July 2005, in Montreal, Canada. The extraordinary meeting will seek to resolve disagreements over exemptions allowing methyl bromide use in 2006. For more information, contact: Ozone

Secretariat; tel: +254-2-62-3850; fax:+254-2-62-3601; e-mail: ozoneinfo@unep.org; internet: <http://www.unep.org/ozone>

2005 ANNUAL MEETING OF THE INTERNATIONAL ENERGY WORKSHOP: This workshop is scheduled from 5-7 July 2005, in Kyoto, Japan. Themes to be covered include managing uncertainty and abrupt climate change, UNFCCC/Post-Kyoto regimes and technological responses to climate change. For more information, contact: Leo Schrattenholzer, IIASA; tel: +43-2236-807-225; fax: +43-2236-807-488; e-mail: leo@iiasa.ac.at; internet: <http://www.iiasa.ac.at/Research/ECS/IEW2005/index.html>

G8 GLENEAGLES 2005 SUMMIT: This meeting will convene from 6-8 July 2005, in Gleneagles, Perthshire, Scotland. For more information, contact: British Prime Minister's Office; fax: +4420-7925-0918; internet: <http://www.g8.gov.uk/>

SOLAR WORLD CONGRESS 2005: This congress will take place from 6-12 August 2005, in Orlando, Florida, US. For more information, contact: Becky Campbell-Howe, American Solar Energy Society; tel: +1-303-443-3130; fax: +1-303-443-3212; e-mail: bchowe@ases.org; internet: <http://www.swc2005.org>

WORKSHOP FOR INNOVATIVE FINANCING OF DEVELOPMENT AND TRANSFER OF TECHNOLOGIES: This UNFCCC workshop is tentatively scheduled for October 2005. For more information, contact: UNFCCC Secretariat; tel: +49-228-815-1000; fax: +49-228-815-1999; e-mail: secretariat@unfccc.int; internet: <http://unfccc.int/>

SEVENTEENTH MEETING OF THE PARTIES TO THE MONTREAL PROTOCOL: MOP-17 is tentatively scheduled to take place 12-16 December 2005, in Dakar, Senegal. For more information, contact: Ozone Secretariat; tel: +254-2-62-3850; fax: +254-2-62-3601; e-mail: ozoneinfo@unep.org; internet: <http://www.unep.org/ozone>

FIRST MEETING OF PARTIES TO THE KYOTO PROTOCOL AND ELEVENTH CONFERENCE OF PARTIES TO THE UNFCCC: Scheduled for 28 November to 9 December 2005, in Montreal, Canada, the first Meeting of Parties to the Kyoto Protocol (MOP 1) is taking place in conjunction with the eleventh session of the Conference of Parties (COP 11) to the UN Framework Convention on Climate Change. For more information, contact: UNFCCC Secretariat; tel: +49-228-815-1000; fax: +49-228-815-1999; e-mail: secretariat@unfccc.int; internet: http://unfccc.int/meetings/unfccc_calendar/items/2655.php