

21 October 2008

ENGLISH ONLY

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

SUBSIDIARY BODY FOR IMPLEMENTATION

Twenty-ninth session

Poznan, 1–10 December 2008

Item 6 (a) of the provisional agenda

Implementation of Article 4, paragraphs 8 and 9, of the Convention

Progress on the implementation of decision 1/CP.10

**Status of implementation of Article 4, paragraph 8, of the Convention,
decision 5/CP.7 and decision 1/CP.10**

Submissions from Parties and relevant organizations

1. The Subsidiary Body for Implementation, at its twenty-eighth session, agreed that the assessment of the status of implementation of Article 4, paragraph 8, of the Convention, decision 5/CP.7 and decision 1/CP.10 referred to in decision 1/CP.10, paragraph 22, will consider further views from Parties and relevant organizations submitted to the secretariat by 19 September 2008 (FCCC/SBI/2008/8, annex III, para. 5 (b)).¹
2. The secretariat has received six such submissions. In accordance with the procedure for miscellaneous documents, these submissions are attached and reproduced* in the language in which they were received and without formal editing.

¹ Previous submissions from Parties on this subject are contained in document FCCC/SBI/2008/MISC.4.

* These submissions have been electronically imported in order to make them available on electronic systems, including the World Wide Web. The secretariat has made every effort to ensure the correct reproduction of the texts as submitted.

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** This submission is supported by Croatia, the former Yugoslav Republic of Macedonia, Montenegro and Turkey.

PAPER NO. 1: FRANCE ON BEHALF OF THE EUROPEAN COMMUNITY
AND ITS MEMBER STATES

**SUBMISSION BY FRANCE ON BEHALF OF THE EUROPEAN COMMUNITY AND ITS
MEMBER STATES**

**This submission is supported by Croatia, the Former Yugoslav Republic of Macedonia,
Montenegro and Turkey**

Paris, 17 October 2008

**Subject: Implementation of Article 4, paragraphs 8 and 9, of the Convention
Views on the status of implementation of Article 4, paragraph 8, of the Convention,
decision 5/CP.7 and decision 1/CP.10**

The European Union and its Member States welcome this opportunity to share further views on the status of implementation of Convention Article 4(8) and COP decisions 5/CP.7 and 1/CP.10 with regard to actions and activities addressing the adverse effects of climate change and the implementation of response measures.

I. IMPACTS OF THE ADVERSE EFFECTS OF CLIMATE CHANGE

In March 2008, the EU submitted its views (contained in FCCC/SBI/2008/MISC.4) on the status of implementation of Article 4(8) and COP decisions 5/CP.7 and 1/CP.10 which included information on measures the EU has undertaken to support the implementation of the above mentioned Article and COP decisions.

This submission contains additional information and highlights the specific achievements and outcomes, the lessons learned and good practices identified, the challenges faced, and identified gaps for further implementation of adaptation commitments. Some examples of activities undertaken by Member States and at the EU level are included in the annex.

Introduction

The UNFCCC calls on all Parties to prepare programmes to facilitate adequate adaptation to the adverse impacts of climate change and to cooperate in preparing for adaptation to the impacts of climate change. Parties are further called on to give full consideration to the actions necessary under the Convention to meet the needs and concerns of developing countries arising from the adverse impacts of climate change. These commitments are further elaborated in decisions 5/CP.7 and 1/CP.10.

The EU has responded to these calls by providing support through EU development policy, via governments, through national and international bilateral and multilateral agencies and organisations, and through contributions to the UNFCCC funds. Furthermore, through active participation of Member States in the Carbon Market, the EU has made a contribution to the Adaptation Fund in the share of proceeds generated by the certified emissions credits from CDM projects. Member States have also supported the Nairobi work programme (NWP) and the regional workshops in Africa, Latin America, Asia and expert meetings in Jamaica and Fiji under decision 1/CP.10.

General Approach

The EU has taken on the challenge of adaptation, working in partnership with its Member States and globally with partner countries.

The EU believes that adaptation actions should be practical, environmentally sound, economically efficient, coordinated and based on the "country system" principles (e.g. public financial management, procurement, safeguards and managing for results) and priorities; and supported by a broad range of bilateral and multilateral institutions in ways that foster harmonisation and alignment. In line with the 2005 Paris Declaration, interventions should be aligned to support national policies and programmes on adaptation as well as national planning and implementing structures.

The EU has been the biggest contributor to the Least Developed Countries Fund and to the Adaptation window of the Special Climate Change Fund. These contributions have supported planning and capacity building activities related to adaptation. Furthermore, support is provided to specific initiatives such as the UNDP and UNEP partnership initiative on adaptation that was announced at COP12 by the former UN Secretary-General.

In 2005, the EU and other OECD member countries agreed to develop and apply coherent approaches to integrating climate change adaptation into development co-operation, in collaboration with relevant partners, and bearing in mind other international initiatives. Progress has been made to raise the awareness among international financial institutions, bilateral agencies and multilateral banks on climate risks and vulnerabilities.

The 2004-2008 action plan on climate change in the context of development cooperation, ensures climate change is incorporated into all aspects of EU development policy. Measures focusing on adaptation action include: supporting partner countries in preparing vulnerability and adaptation assessments and NAPAs, developing guidelines for integrating climate change into development programmes, supporting capacity building in developing country institutions, to prepare for and reduce the impact of climate change related disasters.

The new Joint Africa-EU Strategy and first Action Plan (2008-2010) supports the efforts of Africa, particularly LDCs and SIDS, to counter the effects of climate change to move towards sustainable development and to adapt to the negative effects of climate change, notably through the integration of climate change considerations into development policy.

In terms of specific activities, a number of programmes are listed in the attached annex. These are only a few examples of the activities that EU Member States have undertaken pursuant to the COP decisions and in response to the call to Parties to cooperate in addressing adaptation needs.

Achievements, challenges, lessons learned and good practices identified in the implementation of Article 4(8) and decisions 5/CP.7 and 1/CP.10

The regional workshops to identify the needs and concerns of developing countries and the Nairobi work programme to share and further our understanding of impacts vulnerability and adaptation, have succeeded in drawing attention to barriers to adaptation to climate change, and highlighting gaps in policy and knowledge. Despite the many barriers, the implementation of Article 4.8 and its decisions 5/CP.7 and 1/CP.10 have made a good initial contribution and a good basis on which to hone in on the priority areas in the future. From the experience of the EU, what emerges very strongly from the processes under Article 4.8 are the following:

It is clear that adaptation is a process and one which must be embedded in national development processes and strategies. Adaptation to climate change cannot be addressed in isolation of other economic and developmental concerns. Furthermore, adaptation requires the actions of a broad range of actors within and across sectors and at different levels of society. Political commitment and cooperation amongst ministries are essential and key government ministries such as finance and planning need to be involved in the development of adaptation strategies and plans.

While pilot projects and programmes are undoubtedly contributing to advancing our knowledge and understanding of climate impacts and adaptation, there is a strong view amongst many (expressed at workshops) that pilot projects do not always realise their full potential if teams and expertise are lost when disbanded, information is not disseminated effectively, and thus appropriate action is not taken by decision makers. However, conducted in the context of national policy frameworks such efforts would maximise continuity and long term benefits. For this reason the EU underlines the importance of ensuring that support provided to adaptation actions is consistent with the national needs and priorities of countries.

Related to this is the need to strengthen local institutions and knowledge systems and make use of and invest in available capacities for the proper assessment and evaluation of the climate vulnerability in the short- and long-term. The role of regional centres (such as the Caribbean Climate Change Community Centre) has been duly noted in addressing these needs.

A significant challenge in many developed and developing countries is the absence of data (including socio-economic data) and information. Further work is needed to build the institutional capacities to collect, process and analyse relevant data in order to make vulnerability and adaptation assessments. Furthermore, the coarse resolution of most available climate model outputs, makes it very challenging to use the results as a basis for adaptation. The development of higher resolution models, coupled with building capacity to apply them to national circumstances, training for model development and support for climate observations is needed.

Identified gaps remaining in the implementation of Article 4(8) and decisions 5/CP.7 and 1/CP.10

While the EU is of the view that significant work has been undertaken on adaptation and in particular to implement the Convention Articles and relevant decisions, a lot remains to be done to reduce vulnerability and increase resilience in developing countries. This relates not only to deepening our understanding in key areas, but also to set in place the necessary tools and measures to ensure continuity. Thus, the EU suggests that further efforts should be made in the following areas that are consistent with the EU proposal to elaborate a framework for action on adaptation.

- to better understand the costs and benefits of adaptation;
- to mobilise the financial and technical resources necessary to support adaptation actions, in particular for the most vulnerable namely the least developed countries, small island developing States and African countries affected by drought, desertification and floods;
- to raise awareness and build capacities at the local, national and regional levels to enable planning, preparation and responses to adaptation;
- to enhance the understanding of impacts of, and vulnerability to climate change and approaches to adaptation;
- to mobilise relevant actors and organisations and promote synergies between relevant processes and the work of international and regional organisations and the private sector;

- to improve the understanding and promote the use of risk management instruments, including through involvement of the private sector and private-public partnerships;
- to improve our understanding of the effectiveness of adaptation measures in order to identify best practices, avoid maladaptation and highlight policy and information gaps for further action.

The EU reaffirms its commitment to continue working with all Parties to support adaptation activities and programmes in developing countries in order to enhance their resilience to address the impacts of climate change.

II. IMPACTS OF THE IMPLEMENTATION OF RESPONSE MEASURES

General remarks

The EU is of the view that while important work has been undertaken to address the concerns arising from the impacts of response measures, some further work would need to be done to better understand the potential impacts of climate change response measures and the minimisation of adverse effects.

There is a general consensus on the need to undertake a global transition to a low greenhouse gas emitting economy in order to tackle climate change. This transition presents a major opportunity for all countries to follow a clean development path and implement sustainable policies. At the same time EU understands the concerns some countries may have about the challenges that this transition may present to their economies and societies. The EU is of the view that this transition should be congruent with sustainable development processes in all countries.

The EU acknowledges the need for cooperation to enhance the understanding of economic and social consequences of response measures under the Bali Action Plan, as well as under relevant decisions of the COP and will continue to implement its climate change policies to reduce emissions in a way that takes into account the needs of developing countries.

Achievements, challenges, lessons learned and good practices identified in the implementation of Article 4.8 and decisions 5/CP.7 and 1/CP.10

The EU is striving to minimise the potential adverse impacts of the implementation of its climate change policies and measures. In addition, the EU and its Member States are engaged in many initiatives in developing countries that aim to reduce the vulnerability of certain sectors, diversify energy sources, and to build capacity to assess and analyse any potential impacts. The following are some examples of the achievements to date. These are by no means an exhaustive list but serve to illustrate the nature of the activities undertaken.

Design and predictability of climate change policies and measures / providing information

In meeting its commitments under the Kyoto Protocol, the EU is implementing policies and measures to mitigate climate change that address all sectors and greenhouse gases. In this way, the EU aims to minimise any adverse impact of response measures in any one specific sector.

Moreover the EU is putting in place long-term goals and is defining the needed policies and measures on the long term, which will improve the predictability of its response to climate change. In this line, the EU is currently discussing a new package for climate action and renewable energy that aims at giving more visibility to the EU's long term policy (2020 and over).

The EU Emissions Trading Scheme (EU ETS), for example, has already proven to be an effective tool to reduce greenhouse gas emissions across a range of sectors in an efficient and cost effective manner. Through the ETS and the linking directive that allows European facilities to engage in the CDM as a way of meeting their commitments, has increased the investments in renewable energy and energy efficiency in developing countries and as such making a modest while important contribution to diversifying the energy mix in those countries. The EU ETS review proposal of 23 January 2008 for the period after 2012 aims at integrating other greenhouse gases than CO₂, including PFCs from the aluminium industry and N₂O. It also includes new technologies like Carbon Capture and Storage (CCS) to seek to the extent possible to enable the use of fossil fuels with near zero green house gas emissions.

Concerning its climate change policies and measures and their implementation the EU is producing a lot of documentation including impact assessment (see European Commission website) for each EU legislation and information in the national communications of the European States with the view of better informing all the stakeholders and taking the most appropriate decisions e.g for the integration of the aviation sector in the EU ETS a study was conducted by consultants (Öko-Institut, Germany) to analyse the impact of this measure on the actors in this sector. The results were presented in a side event in Bonn (SB 28).

Technology transfer/development of low carbon technologies

The EU's "Seventh Framework Programme" for Research and Technological Development is the EU's main instrument for funding research and it runs until 2013. The EU Research Programme is not only for EU Member States as more than 100 countries from all over the world are involved in the Programmes. The Research Programme covers a number of areas, including 'cooperation and inviting developing countries to participate in EU-funded programmes which covers the international cooperation actions in the 10 thematic areas and across themes. Cooperation areas include the development and demonstration of clean coal technologies including carbon capture and storage. For example the EU has already allocated resources for cooperation on CCS use in China. The European Commission has proposed a significant budgetary allocation for the Global Climate Change Alliance (GCCA) and clean carbon technology transfer including Carbon Capture and Storage.

The EU has recently launched a project on concentrated solar power, the Mediterranean Solar Plan with Mediterranean countries (including African countries like Egypt, Algeria and the GCC) to develop these technologies in the Mediterranean countries and to offer the European market as primary buyer to secure the viability of the project.

Capacity building

Capacity building is essential to support the diversification of economic activities and reduce over reliance on vulnerable sectors. Capacity building is a central element in virtually all EU support to cooperating partners. Several EU Member States are involved in supporting energy sector reforms and development activities in developing countries especially with a view to increase energy security and diversify the energy resources. Support is also provided to strengthen the capacity to adopt and maintain new technologies. An example is the Swedish support to the Government of Tanzania to establish a National Biofuels Task Force that would prepare the regulatory framework for investments in biofuel production in the country.

Areas for further work in the implementation of Article 4.8 and decisions 5/CP.7 and 1/CP.10

The EU is of the view of that significant efforts are being made to address the needs and concerns arising from the implementation of response measures. The EU recognises that there are areas where further work could be undertaken to enhance the understanding of the issue.

While the EU is making significant efforts to understand the needs and concerns of developing countries arising from the impacts of the implementation of response measures, it is important to emphasise that

wider economic and political factors do play a role on the vulnerability of social economic sectors and these should not be overlooked. As an example, the impact assessment conducted for the integration of the aviation sector in the EU ETS (as mentioned before) showed, inter alia, that the policy itself could have a far lesser impact on the transport of perishables than other factors, like the increase in market prices for oil.

In addition, the EU notes the need to enhance the exchange of information among all Parties and in particular from developing countries in order to get a better understanding of the issue.

The EU recognises that the analysis of potential impacts of the implementation of climate change policies and measures remains a complex exercise that is limited due to several factors, such as lack of comprehensive data, quantifying the economic impacts associated with the different policies and policy instruments (fiscal, monetary, regulatory) and separating climate policy consequences from consequences of other policies (e.g. energy, environment, social).

Conclusion

The EU affirms its willingness to continue to cooperate with developing country parties in particular in the area of capacity building, technology development and transfer and in the broader development context to enable all parties to manage the transition to a low carbon future while achieving a sustainable development.

The EU believes that there is also a need for examining the potential of general and holistic approaches to diversifying economies to reduce the vulnerability resulting from heavy dependency on key sectors would not only address these factors but also any potential effects of response measures and as such increase levels of foreign investment, improve prospects for employment and thus contribute to sustainable development.

The EU looks forward to conducting an effective assessment on the status of implementation of the article 4.8 of the Convention. The EU wishes to continue this constructive discussion and to consider which further actions would be the most appropriate to deal with this issue.

ANNEX

Examples of activities undertaken by Member States and at the EU level with regard to actions and activities addressing the adverse effects of climate change

This annex contains brief descriptions of some examples of activities undertaken by Member States either alone or in cooperation.

- i) Development and integration of adaptation actions into planning processes

Adaptation strategy development support in the water sector in Indonesia

Support of the development of an adaptation strategy in the water sector in Indonesia through support to national ministries and local authorities in charge of water resource management in identifying and assessing climate risks and adaptation measures and in prioritizing and planning adaptation.

- ii) Capacity building, training and awareness to implement adaptation strategies

Building capacity to address climate change in LDCs

This programme of activities aims to build capacity to address climate change in the Least Developed Countries (LDCs) in Africa and South East Asia as well as some Small Island Developing States (SIDS). The focus is on a) building capacity to negotiate in the UNFCCC process, particularly on post 2012 issues and b) building capacity to address climate change (adaptation and mitigation) in the activities of each of the stakeholder groups in LDCs (government officials, politicians, media, sectoral professionals, development workers, NGOs, researchers and academics, local government and vulnerable communities).

- iii) Risk management approaches

Support to Adaptation and Risk Management in Nepal

Supports work on adaptation and risk management in the Himalaya region through contributions to the International Centre for Integrated Mountain Development (ICIMOD), a governmental but non-political organisation in Nepal. ICIMOD has developed a programme that aims at developing climate change adaptation and resilience strategies. Work is to be conducted in collaboration research institutes on Meteorology and Hydrology amongst others.

- iv) Mobilisation and cooperation with relevant organisations

Support to the Caribbean Community Climate Change Centre in Belize

In 2004, in cooperation with the Caribbean Community Climate Change Centre (CCCCC), joint development and implementation of programmes, projects and activities, It enhances regional institutional capabilities for the co-ordination of national responses to the negative effects of climate change, provides policy and technical support in the area of climate change, and supports mechanisms for regional climate change vulnerability and risk assessment. In addition support is provided for the enhancement of the capacity of the CCCCC to assist the CCCCC Members to fulfil their responsibilities under the United Nations Framework Convention on Climate Change and the Kyoto Protocol.

v) Enhancing technologies for adaptation

Consultative Group International Agricultural Research (CGIAR)

In the field of research in agriculture, rural employment, food security support is provided as part of the CGIAR. The priorities of CGIAR research are: Reducing hunger and malnutrition by producing more and better food through genetic improvement, Sustaining agriculture biodiversity both in situ and ex situ, Promoting opportunities for economic development and through agricultural diversification and high-value commodities and products, Ensuring sustainable management and conservation of water, land and forests, Improving policies and facilitating institutional innovation, A critical task for 11 of the CGIAR Centers is to maintain international genebanks, which preserve and make readily available the plant genetic resources that form the basis of food security worldwide. In addition, the CGIAR implements several innovative “Challenge Programs” designed to confront global or regional issues of vital importance. Implemented through broad-based research partnerships, Challenge Programs mobilize knowledge, technology and resources to solve those and other problems such as micronutrient deficiencies, which afflict more than three billion people; water scarcity, which already affects a third of the world’s population; and climate change, which poses a dire threat to rural livelihoods across the developing world.

vi) Follow up on effectiveness of adaptation action

Climate Change Adaptation in Rural Areas in India

Support climate change adaptation in rural areas in India, including the following components: assessment of climate variability and climate change in pilot regions; identification and testing of adaptation measures in the agriculture, water and forestry sector; integration of proposed measures for climate proofing in federal and state rural development programmes; establishment of knowledge management system benefiting all relevant Indian and regional organizations dealing with climate variability and climate change;

PAPER NO. 2: JAPAN

**Views on the assessment of the status of the implementation of Article 4, paragraph 8, of the Convention, and decisions 5/CP.7 and 1/CP.10
Submission by Japan**

Japan welcomes the opportunity to provide its views on the status of implementation of Article 4, paragraph 8, of the Convention, and decisions 5/CP.7 and 1/CP.10.

1. The actions and activities addressing the adverse effects of climate change

1.1. Basic views behind Japan's actions and activities

Adaptation is related to a wide range of issues and thus it is important for developing countries to mainstream it into development policy. The OECD/DAC is compiling knowledge on mainstreaming adaptation, and consensus is essential for the appropriate mainstreaming.

Adaptation to climate change is an issue to be dealt with by all countries; however, development of adaptation measures is urgently required in regions with demonstrated need. Adaptation measures must be developed in such countries that are vulnerable to adverse effects of climate change (SIDs and LDCs, etc.).

In implementing adaptation measures, scientific knowledge is essential to prevent mal-adaptation. Japan's **Earth Simulator**, which enables simulations of extreme climate events under future climate conditions, plays an important role in obtaining basic understanding for the implementation of adaptation measures (See 1.2(4)). The **Global Map** is reliable geographic information to effectively cope with global environmental issues (See 1.2(4)).

The development of **indicators to assess the usefulness and effectiveness of adaptation measures** is also necessary. In Japan, the Institute for Global Environmental Strategies (IGES) is engaged in developing such indicators with the World Bank.

It is also crucial to increase financial support for adaptation measures. In this regard, Japan considers it important to operationalize the Adaptation Fund (AF) as soon as possible.

As Japan's initiative for financial support, Japan launched the "Cool Earth Partnership" this January with the objective of enhancing the financial support for adaptation measures (See 1.2(4)). Furthermore, a new multilateral fund the Climate Investment Funds was established this July under the World Bank.

Examples of bilateral and multilateral cooperation Japan has been engaged in are listed below. Japan will continue to put efforts on addressing the adverse effects of climate change.

- (1) Vulnerability assessment
- (2) Formation of research network
- (3) Exchange of data and information
- (4) Other measures relating to adaptation

1.2. Examples of efforts regarding implementation of these Articles and decisions

(1) Vulnerability assessment

● **Indicators to measure adaptation effectiveness**

IGES, an affiliate of the Ministry of the Environment Japan, is currently conducting a joint-study with the World Bank on adaptation metrics. The aim of the joint-study is to develop and test quantitative or semi-quantitative indicators of the effectiveness of adaptation actions so that appropriate options are selected and implemented to support the communities and individuals exposed to climate change. The indicators are intended to be measurable, comparable, policy

relevant, and as simple as possible. It is expected that such tools will greatly contribute to the decision-making both in developed and developing countries.

- **Establishment of a network for early detection of the impact of global warming**

Ministry of the Environment Japan, in collaboration with related facilities in East Asian countries, has established an integrated monitoring network that includes both satellite receiving and analyze systems, and ground observation systems to monitor permafrost dynamics and plant productivity among other things in the region. A model to identify and assess the impact of global warming on environmental resources and food is being developed.

- **"Wise Adaptation to Climate Change"**

Ministry of the Environment Japan has published a report titled as "Wise Adaptation to Climate Change" concerning national impacts of global warming and a basic idea for adaptation measures to be taken both in Japan and developing countries especially in Asia-Pacific region in June, 2008. Furthermore, Ministry of the Environment Japan expanded "Global Environment Research Fund" for domestic research laboratories studying "Wise adaptation" in fiscal year 2008.

The report can be downloaded: http://www.env.go.jp/en/earth/cc/wacc_080618.pdf

- **Research on water-oriented climate change adaptation**

The negative impacts of climate change on water will affect all sectors and regions. In May 2008, The Ministry of Land, Infrastructure, Transport and Tourism of Japan (MLIT) compiled an interim policy report "Integrated Water Resources Management (IWRM) addressing climate change and other risks," on the strategy to be adopted both in Japan and the world for integrating the climate change adaptation and water resources management. MLIT also developed a policy report "Climate Change Adaptation Strategies to cope with Water-related Disasters due to Global Warming" in June 2008.

Both reports can be downloaded, respectively:

<http://www.mlit.go.jp/tochimizushigen/mizsei/07study/documents/torimatome/Interim%20Report%20Full%20Text.pdf>

http://www.mlit.go.jp/river/basic_info/english/climate.html

- **Flood related disasters preparedness indices**

The International Centre for Water Hazard and Risk Management (ICHARM), an organization established in 2006 under the auspices of UNESCO, is promoting research on developing indices which enable central and local governments to monitor the performance of their achievements and the effectiveness of actions and policies undertaken to reduce the impact of flood related disasters. The utilization of indices, which address community preparedness and degree of vulnerability reduction at each stage of disaster management cycle to cope with increasing flood related disasters due to possible climate change, will ensure facilitation of the positive spiral of building up national and local preparedness in adaptation measures.

Besides developing indices, ICHARM also promotes research, training and information networking activities in a combined manner to provide localities, nations, regions and the globe with the best practicable strategies for managing the risk of water related disasters, which are to be in an increasing trend due to possible climate change.

For more information on ICHARM: <http://www.icharm.pwri.go.jp/index.html>

(2) Formation of research network

● Asia-Pacific Network for Global Change Research

Asia-Pacific Network for Global Change Research (APN) is an inter-governmental network whose main mission is to promote global environmental change research in the Asia-Pacific region, increase developing country participation in that research, and strengthen interactions between the science community and policy makers.

The APN supported 32 research projects in 2007 on long-term changes related to climatic, marine and terrestrial systems in developing countries. Its support include scientific activities that deal with physical, chemical, biological and socio-economical processes, e.g. research projects and/or capacity building activities related to prediction of impacts and adaptation to climate change in areas such as agriculture and water management.

● Asia-Pacific Water Forum “KnowledgeHubs”

The Asia-Pacific Water Forum’s “KnowledgeHubs” is a family of internationally recognized institutions committed to generating and sharing water knowledge and building capacity in the Asia-Pacific region. It has been supported by Public Utilities Board Singapore, UNESCO, UNESCO-IHE and ADB. Each hub takes the lead in networking with clients and partners on a priority water topic such as urban water management, water quality in river basins, flood management, river basin organizations and management, water and climate change adaptation, hydroinformatics, irrigation service reform, and water governance (for more information: <http://www.apwf-knowledgehubs.net>).

ICHARM is designated as a knowledge hub in charge of water hazard and risk management. ICHARM’s activities as a knowledge hub include research on flood risk management and adaptation strategies to cope with possible global climate change.

● The International Flood Network

The International Flood Network (IFNet) was created on the Flood Days of the 3rd World Water Form at Kyoto in March 2003. IFNet is a network aiming to promote activities that will contribute to reduce the negative impacts of floods by promoting climate change adaptation to cope with water-related disasters. 500 members from 79 countries are participating in IFNet, and Japan has been supporting IFNet activity by sending a vice-chairperson.

(3) Exchange of data and information

● Asia-Pacific Seminar on Climate Change

Japan has been holding the Asia-Pacific Seminar on Climate Change annually since 1991, with the participation of around 20 countries, including developing countries of the Asia-Pacific. The major objectives of the Seminar are to exchange information, experience and views on climate change among countries in Asia and the Pacific and to facilitate further activities to address climate change in the region.

Main topics at the Seminar are those such as capacity building to address climate change issues, preparation work for CDM/JI, and international cooperation for adaptation strategies.

● Asia Pacific Network on Climate Change

A website “Asia-Pacific Network on Climate Change (AP-Net)” was established by Japan in 1998 to facilitate the exchange of experience, data, and information among all relevant countries in the Asia-Pacific region. It contains several links to climate-change related websites in the region and international and regional organizations.

Not only functioning as an information providing tool, AP-Net also gives an opportunity for capacity building. On the request by member countries, a seminar was held to train internet literacy, contents development, and web-administration. Many participants, especially from Pacific Island countries, joined the program. It was also registered as Type2 outcomes (*) in World Summit on Sustainable Development in order to enhance regional strategy on climate change.

(*) Type2 outcomes: Type 2 outcomes are voluntary partnership initiatives of/with the private sector, whereas Type 1 outcomes indicate political agreements and commitment, timetables and action plans amongst governments.

For more information: <http://www.ap-net.org/index.htm>

- **Building of Global Earth Observation System of Systems (GEOSS)**

Based on commitments in G8 Summit Action Plan in June 2003, “GEOSS 10-Year Implementation Plan”, which promote each country and organization to implement comprehensively coordinated earth observations and share those data, was adopted at the third Earth Observation Summit in February 2005. Japan is actively participating in GEOSS development in the various fields and also hosted the GEOSS Asia Pacific Symposium in 2007 and in 2008 to help the region, especially developing countries, adapt to expected impacts by monitoring and predicting changes to climate patterns, the hydrological cycle and ecosystems. Japan is continuously leading the building of GEOSS and will host the 3rd GEOSS Asia Symposium in early 2009.

- **Asia-Pacific Gateway to Climate and Development**

The Asia-Pacific Gateway to Climate and Development (AP Gateway) is a joint initiative among Ministry of the Environment Japan, UNESCAP, and Overseas Environment Cooperation Center (OECC), which intends to function as an information exchange platform for the formulation of adaptation and co-benefit projects. The kick-off meeting of AP Gateway was held in Bangkok on April 23. Forty participants from fourteen countries in the region gathered for the meeting, and discussed how co-benefits and adaptation mainstreaming should be realized.

For more information: <http://www.climateanddevelopment.org/>

- **Cooperation with WMO/ESCAP Typhoon Committee**

WMO/ESCAP(*) Typhoon Committee promotes and coordinates the planning and implementation of measures required for minimizing the loss of life and material damage caused by typhoons in the Asia-Pacific region. Japan cooperates with the committee in countermeasures of water-related disasters, risks of which have been and will be increased by climate change.

(*)WMO: World Meteorological Organization

ESCAP: Economic and Social Commission for Asia and the Pacific

- **Network of Asian River Basin Organizations**

Network of Asian River Basin Organizations (NARBO) was established in February 2004, by Japan Water Agency and ADB, to strengthen river basin organizations (RBO) by facilitating the exchange of knowledge and experience on Integrated Water Resources Management (IWRM) through activities such as workshops and training programs with countries in the Asian monsoon region. Its activities include the exchange of the information on adaptation to climate change.

(4) Other measures relating to adaptation

● Global Mapping project

The Global Map is digital geographic information including land cover and vegetation which represents the current status and changes of global environment. Japan advocated the Global Mapping project in 1992 and currently the map (version 1) has been almost completed by the concerted effort of about 180 participating countries/regions. Japan has assisted more than 80 developing countries in data development, technological transfer and capacity building and will continue to promote the development and utilization of the Global Map for decision-making on adaptation measures.

For more information: <http://www.iscgm.org/>

<http://www.globalmap.org/english/index.html>

● Asia-Pacific Water Forum and the 1st Asia-Pacific Water Summit

Based on the Joint Declaration issued by the Water Ministers of the Asia-Pacific Region in the 4th World Water Forum in Mexico in 2006, the Asia-Pacific Water Forum (APWF), a network of water stakeholders from the Asia-Pacific region for the resolution of water issues in the region and worldwide, was established in September 2006 in Manila. APWF has three priority themes, “Water Financing and Capacity Development”, “Water-related Disaster Management” and “Water for Development and Ecosystems,” and the climate change has become one of major issues for APWF.

The Asia-Pacific Water Summit (APWS) is one of the major activities of APWF, the 1st APWS, the first meeting of heads of government dedicated exclusively to water issues, was held in Beppu, Japan in December 2007, with cooperation of the Japanese government. In the Summit, discussions were conducted, focusing on the priority themes and adaptation to climate change, at the end of the closing ceremony, “Message from Beppu,” which refers to necessity of adaptation to climate change, was read out and welcomed. Discussions conducted in APWS resulted in activities such as dispatch of Japanese preparatory study teams about climate change adaptation to Tuvalu in February 2008 to tackle the issue of coastal erosion, and to Nepal in May 2008 to work on disaster prevention of Glacier Lake.

● Activities undertaken by Japan International Cooperation Agency

The adaptive capacity consists of various interacting elements such as human resources, knowledge, information and technology. Japan International Cooperation Agency (JICA)’s assistance for adaptation in developing countries is to help strengthening of these elements at individual and organizational levels. JICA also emphasizes on supporting to create enabling environment, such as overall policies and rules, for facilitating interactions among those individuals and organizations. In other words, assistance for adaptation undertaken by JICA is to support recipient countries in developing their own adaptive capacity as a whole on multiple levels of individuals, organizations, and societies.

There are three entry points of assistance for adaptation. First is the empowerment of communities by promoting capacity development at specific communities and sharing lessons with others. The second is strengthening of key organizations by promoting human resources development, technology dissemination or research development. The third is the policy formulation and institutionalization where assistance is provided for key ministries to develop their capacity to formulate and implement related policies.

Examples of activities undertaken by JICA are shown in the attachment to this submission report.

- **Earth Simulator**

The Earth Simulator enables simulations of extreme climate events under future climate conditions. Japan will invite trainees from five Asian countries this fiscal year to provide training on climate change adaptation using simulation results obtained by using the Earth Simulator. The same model results are also used efficiently by the World Bank capacity building project, which invites trainees from South American countries to the training on the high-resolution climate change projections.

- **The Cool Earth Partnership**

<Overview>

At the World Economic Forum in Davos in January 2008, Prime Minister Fukuda proposed the “Cool Earth Promotion Programme” which is to be implemented through three parts: (a) ‘post-Kyoto Framework,’ (b) ‘International Environment Cooperation’ and (c) ‘Innovation.’

One of the pillars of International Environmental Cooperation is the assistance to developing countries that are aiming to achieve both emission reductions and economic growth and working to contribute to climate stability. Japan has established the “Cool Earth Partnership” with financial support on the scale of US\$10 billion. With this support, Japan assists developing countries suffering severe adverse impacts as a result of climate change. Japan also assists developing countries for their efforts of emissions reduction such as improvement of energy efficiency.

<Details>

As part of this program, Japan makes use of the Climate Change Japanese ODA Loan (in August 2008, the Government of Japan extended ODA loans up to the total amount of 30.8 billion yen to Indonesia as the first case), Program Grant Aid for Environment and Climate Change, Trade and Investment Insurance for Preventing Global Warming, and Japan-UNDP Joint Framework. At the same time, Japan will further extend the aid in the form of ODA grant aid (non-project grants have already been extended to Madagascar, Senegal and Guyana) and technical cooperation, as well as ODA through international organizations such as the Asian Development Bank. Official finance other than ODA will also be made available through institutions such as the Japan Bank for International Cooperation and Nippon Export and Investment Insurance. Aid will be allocated, for example, to forest conservation and natural disaster prevention in response to climate change, co-benefit measures, and measures toward energy conservation or new energy development.

Now, more than 40 countries participate in “Cool Earth Partnership,” and Japan will continue to promote the “Cool Earth Partnership” through policy consultations with developing countries.

In addition, with the initiative taken by Japan, the U.S. and the U.K., the Climate Investment Funds was established as a multilateral fund under the World Bank. As announced in July, G8 members have pledged approximately US\$ 6 billion contribution to the fund, of which Japan will contribute up to \$1.2 billion. Japan will continue to call on as many other countries to participate.

- **Development of “Guideline for Integrated Water Resources Management at River Basin Level”, addressing climate change**

UNESCO/IHP and MLIT have agreed in April 2008 to produce the guideline to promote IWRM towards the 5th World Water Forum, which is going to be held in Istanbul in March 2009.

- **Cooperation with the Associated Programme on Flood Management**

The Associated Programme on Flood Management (APFM) is a joint initiative of WMO and the Global Water Partnership (GWP). It promotes the concept of Integrated Flood Management as a new approach to flood management for adaptation of changes in the intensity and duration of precipitation patterns as a result of climate change. Japan has been supporting this program by dispatch of experts since 2001.

- **Development of tools by advanced technology for water-related disasters**

For supporting adaptation measures to developing countries, Japan develops useful tools and systems using advanced technology such as Integrated Flood Alert System (IFAS), Global Flood Alert System (GFAS) and Integrated River Information System. Japan will continuously promote to support developing countries by using these technologies.

- **Capacity development for climate change adaptation measures**

Japan has been promoting capacity development programs about climate change adaptation measures to cope with water-related disasters due to global warming.

<Examples>

- * Comprehensive Management of River and Dam (Since 1973)
- * Flood Hazard Mapping Training Course (Since 2004)
- * Water-related Risk Management Course of Disaster Management Policy Program (Since 2007)

- **“Portfolio of Water Actions” and “Commission on Sustainable Development - Water Action and Networking Database”**

In the Ministerial Declaration of the 3rd World Water Forum held in Japan in March 2003, it was agreed to newly establish a website network of the with Portfolio of Water Actions (PWA), in order to support international efforts to achieve the internationally agreed goals related to water and sanitation.

At the conclusion of the 2003-2005 Implementation Cycle of the UN Commission on Sustainable Development (CSD), governments agreed to "develop web-based tools to disseminate information on implementation and best practices," PWA was followed to be the Commission on Sustainable Development - Water Action and Networking Database.

2. The actions and activities addressing the impact of the implementation of response measures

In the context of assisting developing countries' efforts in achieving sustainable development, Japan recognizes the importance of diversifying the sources of incomes of developing countries, particularly in those countries whose economies heavily rely on the income generated by the sales of a single or a few natural resources and/or economic sectors. Therefore, Japan has made substantial contributions to those countries in enhancing economic diversification through various technical cooperation.

For example, through JICA, Japan has dispatched national experts to oil producing countries in the Middle East in order to help investigate new economic sectors for further development and capacity building. Some of the examples of such activities are as follows:

<Examples>

- * Saudi - Japanese Automobile High Institute Project (Saudi Arabia, 2001 - 2006)
- * Developing training center for technology education (Saudi Arabia, 2004 - 2007)

- * Project on the improvement of audio-visual aids and instruction methods in vocational training at the instructor training center (ITC) (Iran, 2002 - 2006)
- * The energy management training center project (Iran, 2003 - 2007)
- * The project for the establishment of the vocational training center for the electric and electronics industry (Tunisia, 2001 - 2006)
- * Dispatching experts and accepting trainee in mining and environment (Oman)
- * Technical cooperation mainly trainee acceptance program especially in nurturing small and medium size company, training industrial technology, and environmental and quality management (Bahrain)

Economic diversification is broad in its concept, and Japan's activities exemplified above are not designed solely for the purpose of addressing the impact of implementation of response measures. On the other hand, the discussion on economic diversification under the Convention should focus on the measures necessary in responding to the adverse consequences of response measures. Therefore, in discussing economic diversification under the Convention, careful consideration must be given in determining the additional measures necessary in addition to the existing measures for economic diversification in general.

Examples of activities undertaken by JICA relating to adaptation

1. Adaptation in general

Technical assistance is provided to develop capacity of developing countries to use downscaling methods for the study of regional- and local-scale climate change.

Project example:

- * Capacity Development for Adaptation to Climate Change in Argentina (Argentina, July 2008-)

2. Water resources

Adaptation measures in this sector may include appropriate water resource management, development, and effective utilization, as well as water quality and sanitation improvement. Institutional development for water resource management and development of rural water supplies are among the examples of the measures taken by JICA projects.

Project examples:

- * The Study on the Integrated Water Resources Management Plan in the Haouz Plain in the Kingdom of Morocco (Morocco, September 2005 - March 2008)
- * The Study for the Water Resources Management and Rural Water Supply Improvement (Yemen, December 2005 - July 2007)
- * The Project for Water Supply Development in the Afar National Regional State (Ethiopia, Basic Design Study: January - July 2006, Exchange of Notes: November 2006, project currently in operation)
- * The Project for Model Project for Water Saving Society (China, June 2008-May 2011)

3. Agriculture / food

Adaptation in this sector may include irrigation facility development, crop plant breed improvement, rural development with participation of local residents, and countermeasures against extreme climate events. JICA projects with adaptive effects include water management with participatory approach, transfer of rice cultivation technology, integrated rural development approach.

Project examples:

- * The Study on Comprehensive Agricultural Development of Prek Thnot River Basin (Cambodia, July 2005 - August 2008)
- * Promotion, Development and Dissemination of NERICA Rice Varieties in Uganda (Uganda, June 2004 - June 2006)
- * The Study on the Capacity Building Programs for the Community-based Prevention of Desertification in the South Region of Segou in the Republic of Mali (Mali, July 2004 - January 2008)

4. Forest / nature conservation

Development of infectious disease/vectors-resistant tree species, mangrove conservation, forest fire disaster prevention, and afforestation in arid areas are considered as adaptation measures in this sector. The examples of the measures taken at JICA projects include research

and development of adaptation technologies, transfer and dissemination of appropriate technologies, and strengthening of monitoring abilities.

Project examples:

- * The project on Coastal Wetland Conservation in Yucatan Peninsula (Mexico, March 2003 – February 2010)
- * Palau International Coral Reef Center Strengthening Project (Palau, October 2002 - September 2006)
- * The Japan-China Cooperation Science and Technology Center for Forest Tree Improvement Project (China, October 2001 - October 2008)
- * The Project on Participatory Forest Management (Nicaragua, January 2006 - January 2011)

5. Disaster prevention (including coastal defense)

Adaptation in this sector may include coastal disaster prevention, river disaster prevention, landslide disaster prevention, and disaster prevention planning. Among the measures taken at JICA projects are implementation of countermeasures against current disaster risks, awareness raising and capacity strengthening on disaster management in communities, establishment of early-warning systems, and capacity improvement of governmental section in charge of disaster prevention.

Project examples:

- * The Study on Comprehensive Flood Mitigation for Cavite Low in the Republic of the Philippines (the Philippines, March 2007 - January 2009)
- * The Project for the Seawall Construction in Male Island (Phase 4) (Maldives, Basic Design Study: February - June 2000, Exchange of Notes: August 2000, Completed in November 2002)
- * The Project for the Construction of Multipurpose Cyclone Shelter (Phase V) (Bangladesh, Basic Design Study: March - July 2003, Exchange of Notes: November 2003, Completed in November 2005)
- * The Study on Integrated Flood Management for the Nyando River Basin (Republic of Kenya, July 2007- March 2009)
- * The Project for the Strengthening the Flood Management Function of DPWH (the Philippines, July 2005 - June 2010)
- * The Project for the Integrated Disaster Mitigation Management for “Banjir Bandang” (Indonesia, June 2008 - May 2011)

6. Urban / regional development and transportation

Adaptation measures in this sector may include development plan formulation and infrastructure maintenance. There are few JICA projects that take account of future climate change risks. However, projects that address current climate risks are also expected to help recipient countries in enhancing their capacity to respond to future risks.

Project examples:

- * The Project for Improvement of National Road No.1 (Phnom Penh- Neak Loueng Section) (Cambodia, Basic Design Study: March 2004 - March 2005, Exchange of Notes: June 2005, project currently in operation.)

- * The Project for the Construction of Portable Steel Bridges for Rural Roads (Bangladesh, Basic Design Study: December 2004 - August 2005, Exchange of Notes: November 2005, Completed in January 2007)
- * The Detailed Design Study on the Outer Circular Highway to City of Colombo in the Democratic Socialist Republic of Sri Lanka (Sri Lanka, 2001-2002, 2004-2005)

7. Health

Adaptation in this sector may include measures against malaria, waterborne infectious diseases, as well as actions tailored for high risk areas. Among the measures taken at JICA projects are strengthening of adaptive capacity through maintenance of health information system and establishing of an administration system to control diseases.

Project examples:

- * Enhancement of early diagnosis for Malaria (Tanzania, November 2004 - November 2007)
- * Lusaka District Primary Healthcare Project (Phase 2) (Zambia, July 2002 - July 2007)

8. Acceptance of trainees

Among various technical training courses conducted by JICA, there are many courses that are related to adaptation to climate change. The examples include anti-tropical diseases, water management technology in dry regions, measures against extreme climate events, agricultural crops cultivation, and ecosystem protection. Specifically, the Group Training Course on “Development of Strategies on Climate Change” has been successfully conducted for many years, contributing to helping the participants in enhancing their capacities on adaptation.

PAPER NO. 3: SRI LANKA

Implementation of Article 4, paragraphs 8 and 9, of the Convention

- i. In order to address adverse effects of climate change, Sri Lanka has taken the initiative to establish a Climate Change Secretariat under the Ministry of Environment and Natural Resources.
The Objectives of the Climate Change Secretariat are as follows;
 - Provide a platform to address climate change issues at the National level.
 - Serve as the dedicated institutional mechanism on climate change responses.
 - Function as the repository and databank of climate change information.
 - Facilitate climate change related research and distribution of research results to trigger policy reforms and actions.
 - Establish a mechanism to monitor impacts of responses to climate change.
 - Liaise with the Secretariat to the UNFCCC and discharge Sri Lanka's obligations.
 - Serve as the Secretariat for the Designated National Authority for CDM projects.
 - Provide a one – stop facility to disseminate information relating to the implementation, of the decisions taken at the UNFCCC / COP meetings and meetings of parties to the Kyoto Protocol.
- ii. However, in order to prepare action plans to address adverse effects of climate change, the capacities of relevant stakeholder institution need to be strengthen.
- iii. Sri Lanka though not a Least Developing Country or a Small Island State is being seriously impacts by climate change as the majority of the population live in low-lying coastal areas. Furthermore, most of the economic activities are concentrated into these highly vulnerable coastal areas.
- iv. More information on access to appropriate funding is important for Sri Lanka and other developing countries.
- v. Presently Sri Lanka is in the process of preparing the Second National Communication and the process attempts to improve methodologies used for the preparation of the first First National Communication.
- vi. Risk assessment and risk management are identified as major requirements, but lack of techniques and criteria for this purpose, as well as lack of capacity to carry out modelling is a barrier.

PAPER NO. 4: UNITED NATIONS DEVELOPMENT PROGRAMME

Information submitted by the United Nations Development Programme on actions and activities addressing the adverse effects of climate change

The SBI, at its twenty-eighth session, agreed on the terms of reference that will serve as the basis for the assessment by the COP of the status of implementation of Article 4, paragraph 8, of the Convention, and decisions 5/CP.7 and 1/CP.10, to be undertaken at its fourteenth session (FCCC/SBI/2008/8, paragraphs 35-39). The SBI also requested views from relevant organizations on actions and activities addressing the adverse effects of climate change (FCCC/SBI/2008/8, annex III, para. 5 (b)). In response to this invitation, the United Nations Development Programme (UNDP) submits the following information, which responds to the actions noted in FCCC/SBI/2008/8, para. 38 (a) (i)-(iv), “*Adverse effects of climate change*”:

(i) Improving information on accessing existing funds for adaptation, including for the implementation of national adaptation programmes of action (NAPAs), through, inter alia, creating a web-based interface on the UNFCCC website;

(ii) Enhancing access to existing funds for adaptation, including through integrating adaptation into development cooperation programmes to the extent feasible, disseminating information on modalities for access, and building capacity for the preparation of project proposals and for project implementation;

- **National Adaptation Programmes of Action:** UNDP’s experience includes support to over 30 Least Developed Countries in the preparation of their National Adaptation Programmes of Action (NAPAs) as well as the implementation of NAPA priority projects, which are currently under development in more than 20 countries. These projects work to implement activities described in the NAPAs and enhance adaptive capacity across sectors. Examples include: Reducing Climate Change-induced Risks and Vulnerabilities from Glacial Lake Outburst Floods in the Punakha-Wangdi and Chamkhar Valleys (Bhutan), Integrated Adaptation Programme to Combat the Effects of Climate Change on Agricultural Production and Food Security (Benin), and Strengthening adaptive capacities to address climate change threats on sustainable development strategies for coastal communities (Haiti).
- **National Communications Support Programme:** For more than a decade, UNDP has heavily invested in supporting national communication. UNDP has now supported about 200 Initial and Second National Communications, including those of China, India, and Brazil. This effort includes regional workshops, guidance, and online resources are detailed at www.ncsp.undp.org.
- **Online resources:** UNDP manages both internal and external resources to facilitate access information on funds for adaptation. UNDP/GEF provides a programming manual (<http://intra.undp.org/gef/programmingmanual/index.htm>) that outlines streamlined policies and procedures for submitting project proposals. Further, a companion website has been developed (www.undp.org/gef/adaptation) to provide guidance on preparing proposals on adaptation-related projects for submission to UNDP-GEF. More general information about the funds can also be found on the public UNDP site (www.undp.org/climatechange/adapt) and the UNDP intranet (<http://intra.undp.org>).

(iii) Enhancing national planning for adaptation, including through integrating adaptation into the planning process, disseminating information on, and building upon, lessons learned from the NAPA process, and drawing upon information in national communications from Parties and other relevant documents;

- **Supporting Integrated and Comprehensive Approaches to Climate Change Adaptation in Africa:** This US\$ 90 million programme will assist African countries to launch integrated and comprehensive approaches to adaptation with the objective of ensuring that national development processes incorporate climate change risks and opportunities. Countries will be supported through development of capacities and creating the enabling environments to address climate change, including through the following:
 - Comprehensive institutional frameworks to manage climate change risks/opportunities will be put in place; climate-resilient policies and measures will be implemented in priority sectors.
 - Financing options to meet national adaptation costs will be expanded; knowledge on adjusting national development processes to fully incorporate climate change risks/opportunities generated and shared.
- **Climate Change and Development – Adapting by REDucing vulnerability (CC DARE):** This three-year US\$ 3 million programme, with initial emphasis on sub-Saharan Africa, provides advisory services on how to mainstream climate change risks into development decision-making.
- **Integrating climate change risks into development planning and programming (ICCP):** The objective of this US\$ 2 million project is to strengthen technical capacities of countries to integrate climate change risks and opportunities into human development based planning and programming. This will be achieved through the following two outputs:
 - Support for designing climate change strategies and/or related products provided;
 - Capacities to integrated climate change risks within appropriate country level systems for programming development assistance developed.
- **Integrating climate change risks into national development processes and UN country programming for the achievement of the Millennium Development Goals:** This US\$ 1.6 million project will pilot measures to develop the capacity of four countries in Latin America and Sub-Saharan Africa to integrate climate change risk considerations into UN country programming and national development planning and policymaking procedures. It will adopt the objective of “supporting the integration of climate change adaptation and climate risk management considerations into national development plans and policies and UN country programming.” It will be implemented in partnership with UNEP and contribute to Pillar 4 of UNDP’s Climate Change Strategy – mainstream climate change action in all UNDP, and as relevant, UN activities and programmes.
- **Capacity Development for National Policymakers:** This US\$ 7 million project seeks to increase the national capacity of developing countries to co-ordinate views and participate in the Bali Road Map process, as well as assess investment and financial flows to address climate change for up to three key sectors and/or economic activities. It will also expand the knowledge base on climate change available to developing country policy makers, technical experts, and other key stakeholders.

iv) Promoting risk management approaches and other appropriate responses to the adverse effects of climate change, building upon the practical experience of international, regional and national organizations and the private sector, including through disseminating information on best practices and lessons learned;

- **Adaptation Learning Mechanism (ALM):** The ALM (www.adaptationlearning.net) supports efforts to integrate adaptation to climate change in development planning by providing a knowledge-sharing platform that accelerates the process of learning through experience. The ALM draws upon experiences on the ground and features tools and practical guidance to meet stakeholders' needs. The platform contains 140 country adaptation profiles that aim to help Country Offices and other stakeholders develop adaptation initiatives in a rigorous manner that is integrated into broader development programming.
- **UNDP Climate Change Strategy:** UNDP named climate change as a corporate priority and developed a climate change strategy that builds on four pillars:
 - Support the design of integrated climate change policies, strategies and quantified action plans;
 - Promote early adaptation actions and long-term adaptive capacity of developing countries in a programmatic manner;
 - Attract and drive direct private and public investment towards lower carbon technologies and sustainable land use practices; and
 - Integrate climate change into UN and UNDP development assistance at global, regional and national levels
- **Adaptation Policy Framework (APF):** This publication offers a structured approach to formulating and implementing adaptation strategies, policies and measures to ensure human development in the face of climate variability and change. It is built on four major principles:
 - Adaptation to short-term climate variability and extreme events serves as a starting point for reducing vulnerability to longer-term climate change;
 - Adaptation policies and measures are assessed in a developmental context;
 - Adaptation occurs at different levels in society, including the local level;
 - The adaptation strategy and the process by which it is implemented are equally important.
- **Environment & Energy Net (EE-Net):** Environment & Energy Net, a global community of UNDP staff and external experts, is an online forum where members support each other's work through exchanging resources and experiences and discussing current environment and energy related issues. It was established in 1999 and has over 1300 members.
- **Country level climate profiles:** A set of approximately 60 profiles have been developed to assist countries in the identification of climate risks and their management options. Each profile includes analyses of observed trends in key climate variables and projected future changes using the latest climate model outputs that were assessed in AR4. The analyses also covers extreme events such as extreme hot days, dry spells and heavy rainfall events.
- **Proposed Framework for Monitoring and Evaluation of Adaptation to Climate Change:** This publication addresses the unique challenges that climate change adaptation presents for monitoring and evaluation. It focuses on two of these challenges; that climate change adaptation cuts across numerous development objectives, and that adaptation is not simply an outcome, but rather a diverse suite of ongoing processes that enable the achievement of development objectives under changing conditions. The framework proposes standard indicators and units for adaptation initiatives across five adaptation 'processes', and illustrates their application to sample outcomes under each of the six thematic areas.

- **Operational Guidance for Climate Change Adaptation:** This publication elaborates guidance for planning adaptation in six priority thematic areas and represents an effort to ‘operationalize’ the principles introduced by the UNDP-GEF Adaptation Policy Framework. It describes a broad sample of adaptation actions that will be necessary to consider when planning development that relates to each theme. Each of the six chapters describes current development patterns and future trends, current climatic vulnerability, future climate risks, and adaptation options.

PAPER NO. 5: UNITED NATIONS ENVIRONMENT PROGRAMME

Submission under 1/CP.10

Adaptation to Climate Change, UNEP Experience and Strategy

1. UNEP's long-term commitment to climate change

UNEP has more than twenty years of experience working on climate change. UNEP helped establish the IPCC with the World Meteorological Organization (WMO) in the 1980s and conducted assessments of the scientific understanding of climate change in preparation for the 1992 UN Conference on Environment and Development (UNCED). Beyond its support for science and legal mechanisms, UNEP has been active in efforts to reduce the risks of, and improve society's resilience to, climate change, notably through its support to the development of National Adaptation Programmes of Action. Many of UNEP's activities, while not driven solely by climate concerns, have had positive mitigation or adaptation impacts.

2. UNEP's Past Activities in Climate Change Adaptation

In the area of adaptation UNEP has facilitated the development of better local climate data and its use in determining possible impacts of long-term climate change and short-term increased variability; contributed to improving scientific methods and assessment tools, with a view to advancing the understanding of climate change impacts, vulnerability and adaptation needs; and supported the improvement of the science and policy communities' ability to undertake adaptation planning and cost-effective preventive action, including that linked to disaster prevention efforts.

Use of climate data to determine climate impacts: GEF funding has been used to build information and institutional capacity in developing country government agencies, to support the preparation of National Adaptation Programmes of Action, as contemplated in the UNFCCC. UNEP has also been developing and helping countries undertake integrated environmental assessments, such as the Global Environment Outlook and its regional, subregional, national and city versions. The integrated assessments deal with climate change and its impacts as part of a more holistic assessment process.

UNEP implemented a seven-year international project, 'Assessments of Impacts and Adaptation to Climate Change in Multiple Regions and Sectors (AIACC, 2001-2007).' It contributed substantively to the IPCC Fourth Assessment Report (AR4) on Impacts, Adaptation and Vulnerability (Working Group II report) through bridging the knowledge gaps in the most vulnerable yet least developed countries. UNEP has started phase II, which will be focusing on vulnerability analysis and adaptation planning including capacity building in most vulnerable countries.

Advanced numerical models for rainfall downscaling

Adaptation planning and cost-effective prevention: Planning and preparedness are at the heart of several UNEP efforts in this area, notably those aimed at promoting the use of environmental management as an effective tool for disaster risk reduction, integrating environment in relief and recovery operations in post-crises areas, and for ecosystem resilience. As a response to the particular vulnerability of coastal areas, UNEP is supporting national governments in efforts to develop integrated watershed and coastal zone management plans, as well as conducting vulnerability assessments of marine biodiversity, with a view to informing adaptation planning in countries that depend strongly on marine resources. A web-based 'information and knowledge platform' helps disseminate best practices on these and related adaptation policies.

Improved land use and reduced deforestation: UNEP's has an existing portfolio of deforestation, forest degradation and climate change activities. Work includes developing standardized tools for quantification and assessment of Carbon and GHG Benefits, and associated pilot studies and capacity building. UNEP is also working to enhance expertise to generate African carbon credits by promoting forestry and bioenergy projects such as reforestation, agroforestry, and forest and soil conservation efforts. UNEP is also working to identify the extent to which the protected area network captures carbon under the Carbon Storage Value of Protected Areas project. UNEP is also working on projects to promote alternatives to unsustainable forest carbon exploitation by developing innovative revenue streams and positive incentives (in particular REDD) to help minimize the carbon and ecosystem impacts of bioenergy production land-use change and poor development planning. UNEP has pioneered practical options for peatland management and restoration using low-cost techniques which are appropriate for inclusion in future REDD interventions. UNEP also works to improve land use, and reduce deforestation and forest degradation as a source of greenhouse gas emissions.

Awareness and communications: UNEP has developed a multi-faceted approach to awareness raising and communications for climate change, which ranges from global media relations and special events, including World Environment Day, for which UNEP is the lead UN entity, to targeted advocacy via programmes on children and youth and sports and environment. At the regional level, a range of public authority networks have been established with two distinct areas of focus: exchange of best practices and demonstration projects. Some of this work is carried out in cooperation with the UNFCCC Secretariat, supporting Article 6 of the Convention.

Data and assessments: The Global Environment Outlook programme remains UNEP's key source of independent information on the environment, including climate change. The programme is widely used in developing countries to inform policy-making – notably, the links between various environmental issues. In support of this work, the Global Climate Observation System, a set of remote observation programmes, performs a monitoring function in the areas of climate change, ocean and marine ecosystem changes, and terrestrial and physical ecosystem changes. Lastly, UNEP conducts an assessment programme on water scarcity and land use and cover.

3. Strategic Priorities of UNEP's Climate Change Programme

Within the Medium Term Strategy and under the climate change thematic priority, UNEP's objective is to strengthen the ability of countries to integrate climate change responses into national development processes. Consistent with the UNFCCC and within the broader United Nations approach for dealing with climate change, the objectives and expected accomplishments focus on providing environmental leadership in the four areas prominent in the international response to climate change: adaptation, mitigation, technology and finance, and their interlinkages.

The climate change strategy is wholly consistent with the Medium Term Strategy, integrates recent priorities given to UNEP by the UN CEB, and is structured around four themes – mitigation, adaptation, science, and communication:

- **Adapting by building resilience to a changing climate.**
- **Facilitating a transition towards low carbon societies.**
- **Improving understanding of climate change science.**
- **Communicating and raising awareness.**

Under the adaptation pillar, UNEP will help developing countries to reduce vulnerabilities and build resilience to the impacts of climate change. UNEP will build and strengthen national institutional capacities for vulnerability assessment and adaptation planning, and support national efforts to integrate climate change adaptation measures into development planning and ecosystem management practices. The work will be guided by and contribute to the Nairobi Work Programme on Impacts, Vulnerability and Adaptation, and decisions of SBI via AWG-LCA. UNEP will also work to promote sustainable land use management and reduced emissions from deforestation and degradation, reaching co-benefits for both adaptation and mitigation.

4. UNEP's Future Activities on Adaptation

Adapting to climate change is essential since even the most stringent mitigation efforts cannot avoid impacts of a changing climate. Effective national adaptation needs to be fully integrated into national social and economic processes and cannot be undertaken in isolation. Climate change is a serious threat to ecosystems. At the same time, healthy ecosystems can provide natural buffers to the impacts of climate change, especially extreme weather events. Improving the health of ecosystems is one way of adapting to climate change, and yields multiple environmental, economic and social benefits. UNEP will therefore assist developing countries to better integrate an ecosystems approach into their climate change adaptation efforts.

UNEP's work in climate change adaptation will focus on meeting vulnerable countries' twin needs for environmental protection and economic development and assisting them to integrate adaptation into their multi-faceted planning and deliberative processes. Activities will be undertaken in line with the Nairobi Work Programme and guidance of AWG-LCA.

UNEP's work will focus on:

- Assessing vulnerabilities and adaptation services of critical ecosystems and helping to integrate the findings into national decision-making, planning and adaptation practices;
- Promoting ecosystem based-adaptation and planning to help ensure that development efforts are protected from negative impacts of climate change (climate-proofing), including through knowledge sharing, capacity building and technology transfer;
- Helping to strengthen national institutional capacity for adaptation planning, using knowledge, technology and policy support from global and regional networks;
- Helping to strengthen national capacity for undertaking integrated vulnerability and adaptation assessments, including capacity building in developing countries on science assessments of climate change, especially adaptation, and support to feed these into global processes such as the IPCC;
- Supporting countries to integrate adaptation into their national and sectoral development planning processes;
- Providing technical, analytical and policy support to major climate change financing mechanisms, such as the Adaptation Fund managed by the GEF, to support the coherence of their operations and ensure transformational investments in climate change

Examples of current actions contributing to the foci of UNEP's work on adaptation

Climate Change and Development – Adapting by REducing vulnerability (CC DARE), a multi-million project funded by DANIDA, and a joint initiative of UNEP and UNDP, to provide needs-based and demand driven targeted and flexible technical and financial support for actions to reduce vulnerabilities to climate change in Sub-Saharan Africa. It has started its pilot phase with four countries in Africa, Burkina Faso Tanzania, Uganda and Senegal, and will be in full implementation phase drawing

the experiences in its inception phase. The project has been welcomed as a timely initiative both by a number of African ministers at the project launch in Bali in December 2007, during the inception missions and country consultations, and during the meeting of the UNFCCC subsidiary bodies in Bonn in June 2008, where the Ugandan focal point on climate change presented the CC DARE concept and Ugandan experiences to the other members and other countries expressed strong interest in receiving support from CC DARE.

Global Climate Change Adaptation Network, UNEP, in close partnership with UN and other organizations such as the UNFCCC Secretariat, UNDP, WMO, UNITAR, World Bank-CGIAR, IUCN, WWF, ILTER, SEI, IIED, APN and others is developing a Global Climate Change Adaptation Network, which consists of a series of selected ground facilities, national and regional centres in developing countries and an international support group of technical institutions. The aim of the Network is to enhance key adaptive capacity of developing countries through mobilizing the world's best knowledge and technologies to help build the climate resilience of vulnerable ecosystems and economies. It will have a strong focus on supporting the implementation of the UNFCCC Nairobi Work Programme on Impacts, Vulnerability and Adaptation to Climate Change, and the four areas on adaptation for further action defined by AWG-LCA including streamlining and scaling-up resources, adaptation planning, knowledge sharing, and institutional frameworks. It will provide substantial technical, policy and pilot support to local, national, regional and international climate change adaptation initiatives. An international consultation will be held in October 2008 to agree on an implementation plan, which will be followed by pilot networks in Africa and Asia-Pacific.

Climate Change Adaptation and the WFP

Introduction

The Adaptation Challenge

International climate change negotiations have historically focused on how to stabilise greenhouse gases concentrations; their stated goal has been to avoid “dangerous anthropogenic interference with the climate system”.¹

There is, however, increasing evidence that a certain degree of climate change is, in fact, inevitable. This has brought the world’s attention to the need for **climate change adaptation**—the set of measures to be taken at all levels to deal with the actual and expected impacts of climate change.

According to the *Fourth Assessment Report* of the Intergovernmental Panel on Climate Change,² the expected impacts of climate change include:

- Increases in the frequency and intensity of **extreme weather events** such as droughts and floods
- Rising **sea levels**, leading to contamination or salination of both water and agricultural lands³
- Changes in **agriculture productivity** and **rainfall patterns**
- Shifts in the **growing season**
- Decreased **water quality and availability** in arid and semiarid regions

These impacts are projected to increase the number of people worldwide who are at risk of hunger. Increases in both temperature and the incidence of extreme climatic shocks will, in particular, have profound adverse effects on agricultural production. Elevated harms have already been documented. The number of reported climate-related disasters quadrupled between 1980 and 2006, and the number of individuals affected by them worldwide increased during the same period, from 170 million to over 250 million per year.⁴ The overwhelming majority of those adversely affected by climate change live in the developing world.

Policy Responses

Concerns about the impacts of climate change on the world’s poorest and most vulnerable people have led to calls for immediate action to prepare for climate change adaptation. The **Bali Action Plan**, agreed to at the United Nations Climate Change Conference last December, is intended to guide future negotiations along these lines.

¹ Article 2 of the United Nations Framework Convention on Climate Change (1992).

² The Intergovernmental Panel on Climate Change (IPCC) was jointly established in 1988 by the World Meteorological Organisation and the United Nations Environmental Programme in order to provide a balanced view of the state of understanding of climate change. Previous reports, summarizing research from over 2000 scientists, were published in 1990, 1995, and 2001 and were instrumental in inducing governments to adopt the United Nations Framework Convention on Climate Change and the Kyoto Protocol.

³ See Marc J. Cohen, et al, “Impact of Climate Change and Bioenergy on Nutrition,” *IFPRI/FAO* (2008), 4.

⁴ EM-DAT International Disaster Database of OFDA/CRED (USAID Office for Foreign Disaster Assistance/ Centre for Research on the Epidemiology of Disasters) -www.em-dat.net-

The Bali Action Plan stresses the need for enhanced action on adaptation. The policy responses that it proposes include:

- Vulnerability assessments
- Capacity-building and response strategies
- Insurance and disaster reduction strategies
- Consideration of the specific needs of countries in Africa affected by drought, desertification and floods

Further adaptation policy measures are outlined in the 2007/2008 Human Development Report. The Report proposes four “foundations for successful adaptation” to reduce the humanitarian impact of climate change.⁵ They are:

- **Information** for effective planning, including forecasting and disseminating meteorological information.
- **Infrastructure** for climate proofing such as flood defence and drainage systems; reservoirs, wells and irrigation channels; and soil restoration and conservation, on the principle that disaster prevention is cost-effective
- **Insurance for social protection** through (1) employment programs that protect nutrition and health when climate shocks lead to reduced food availability; (2) Cash-transfer or food-transfer schemes that provide a longer-term safety net; (3) Crisis-related cash transfers and transfers of productive inputs; (4) Access to insurance schemes for vulnerable groups that do not have access to formal insurance markets.
- **Institutions** for disaster risk management such as more effective early warning and response systems.

Estimates of the annual costs of adaptation in developing countries	
World Bank - <i>Investment Framework for Clean Energy and Development</i> (2006)	\$9-41 billion per year
The Stern Review - <i>The Economics of Climate Change</i> (2006)	\$4-37 billion per year
Oxfam - <i>Adapting to Climate Change: What's Needed in Poor Countries, and Who Should Pay</i> (2007)	At least \$50 billion
UNDP Human Development Report 2007/2008 - <i>Fighting Climate Change: Human Solidarity in a Divided World</i> (2007)	\$86-109 billion by 2015
UNFCCC - <i>Investment and Financial Flows to Address Climate Change</i> (2007)	\$28–67 billion per year by 2030

⁵ 2007/2008 Human Development Report 2007/2008 Human Development Report - Fighting Climate Change: Human Solidarity in a Divided World. December 2008.

WFP's Role in Climate Change Adaptation

WFP fights hunger in the frontline of complex humanitarian crises. Some of these crises, such as droughts, floods, degradation of natural resources, or conflicts over access to natural resources, will be increasingly exacerbated by climate change. As the world's largest humanitarian agency, WFP's experience and capacity as an implementing partner for governments across the world are critical contributions to the global response to climate change, which include:

- The capacity to respond to climate-related emergencies through a global logistical apparatus, global communications infrastructure and an extensive network of 76 country offices, 270 sub-offices and 9,000 staff in the field, often in high-risk settings like Darfur, DRC and Afghanistan.
- The provision of public goods highlighted in the Bali Action Plan such as vulnerability analysis, needs assessments and risk transfer mechanisms, such as weather-related insurance; and
- The capacity to implement community-based projects that help reduce social and environmental vulnerabilities of food insecure households and communities and help them adapt to climate change. These can include building of flood defences and small-scale irrigation systems, fixing sand dunes, harvesting water, rehabilitating depleted land or planting trees to mitigate the impacts of floods and landslides.

Climate change adaptation and disaster risk reduction play a prominent role in WFP's Strategic Plan for 2008 to 2011. Its programmes and experience in the adaptation area include:

1) *Risk management and risk reduction programme design and implementation*

Disaster risk reduction, preparedness and response programmes are significant opportunities to enhance sustainable development. The central need is to raise awareness, bring about engagement in preparedness in all parts of society and translate assessment of local risks into protective measures.

Guided by governments, who have the primary responsibility for consistent disaster prevention and mitigation policies, and working with partners, WFP adds value to national disaster risk reduction and adaptation frameworks with its disaster management experience and services, field presence as well as programmes to help communities reinforce their essential food and nutrition security systems and infrastructures – including voucher, cash and food-based safety nets.

Risk transfer mechanisms such as index-based weather insurance can help transfer weather related disaster risk from vulnerable populations to public or private risk takers guaranteeing beneficiaries' timely, life-saving assistance. Weather risk management tools help WFP meet the growing demand for emergency response in a cost-efficient way. These risk transfer tools protect livelihoods by facilitating timely support and thereby limiting the economic damage of disasters. Examples include:

- An innovative, weather-based insurance pilot in Ethiopia which protects farmers against devastating shocks caused by severe drought. The first phase in 2006 demonstrated that Ethiopian rainfall data are accurate and timely enough to allow Ethiopian drought risk to be transferred to international re-insurance markets. Since 2007, WFP, the World Bank and DFID have continued to develop a comprehensive drought-risk financing scheme for the 5–8 million Ethiopians subject to transitory food insecurity.

- Designing and piloting drought and flood risk management instruments for the vulnerable poor in China together with the International Fund for Agricultural Development (IFAD).

The potential of this kind of out-of-the-box solution needs to be fully exploited in order to meet the growing demand for emergency response

2) *Vulnerability analysis and Early Warning Systems*

In countries where WFP has a continuing presence, *Vulnerability analysis and mapping* helps the organization, governments, and other stakeholders identify who the hungry poor are, where they are located, the nature and causes of their vulnerabilities. WFP's Food Security Analysis Service and its unique network of about 120 specialists posted around the world answer these fundamental questions through about 90 assessments every year. This information provides timely and reliable information to provide appropriate and effective assistance to vulnerable populations. WFP carries out the following types of analyses, almost always with partners:

- **Comprehensive Food Security and Vulnerability Analyses (CFSVAs)**, which allow for the identification of the major risks to food insecurity and provide for the ability to develop a strategy to monitor them.
- **Emergency Food Security Assessments**, which vary according to the nature of a crisis, ranging from a sudden disaster like the Indian Ocean tsunami of 2004, to a slow onset emergency such as a drought.
- **Food Security Monitoring Systems**, which monitor the evolution of a situation and potential threats and risks to current and future food security.
- **Crop and Food Supply Assessment Missions**, which are conducted jointly with FAO.
- **Joint Assessment Missions**, which are carried out with UNHCR.
- **Inter-agency Assessment Missions**

Building its capacity to understand the longer-term impact of climate on households and livelihoods, WFP is also partnering with academic and research institutions, governments and UN agencies working in applied technology (remote sensing, GIS).

Early warning systems help communities understand and anticipate shocks, including those spurred by climate change, enhance preparedness and response. Building on its expertise, WFP assists governments in putting in place and in strengthening these systems at the national level. WFP also co-chairs the Inter-Agency Standing Committee (IASC) Sub-Working Group on Emergency Preparedness and Contingency Planning and manages the IASC Humanitarian Early Warning Service website.

These tools combined with knowledge transfer are designed to strengthen governments' capacity in disaster preparedness and response. Examples in this area include:

- WFP's work with the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS) to develop tools for exhaustively analyzing food security, which have in turn contributed to improved early-warning and response; and,
- In southern Africa, WFP has worked with the Southern Africa Development Community (SADC) to strengthen the vulnerability analysis and food security monitoring capacity of its member states in order to improve member states' ability to respond to shocks. The project has improved the formulation of food security policies and the management of programmes, particularly social safety nets, and enhanced institutional capacity to undertake vulnerability assessments, livelihoods analysis, food security monitoring and general emergency preparedness.

3) *Implementation of community-based adaptation programmes that help vulnerable groups build resilience to climate change.*

For over 40 years, WFP has devoted around USD 8 billion to programmes that seek to protect and improve the environment, in order to help food insecure communities protect, develop or use natural resources better and to rebuild food security systems and vital infrastructures impacted by disasters.

Under the challenge of climate change, long-standing WFP activities such as targeted food-supported employment programmes are being deployed to build flood defences and small-scale irrigation systems, fix dunes to stop the encroachment of the desert onto agricultural land, plant trees to mitigate the impacts of floods and landslides, harvest water and to rehabilitate depleted land.

These activities, often undertaken in partnership with other UN Agencies, will help vulnerable groups adapt to the actual and expected impacts of climate change. Last year alone, food or cash-based employment programmes targeted to food insecure communities relevant to climate change adaptation and mitigation amounted to USD 280 million and reached over 13 million beneficiaries. They contributed to the construction or rehabilitation of 1,579 ponds, 1,571 wells, 14,305 kilometers of irrigation systems, and 1,621 kilometers of dykes. 169,884 hectares of land were protected, cultivated or rehabilitated and made available for agricultural production, and 152,851 hectares of land were reforested throughout the world. (Inventory for 2007 provided as Annex).

Reforestation, afforestation and land rehabilitation and management activities to transform marginal, eroded-lands into a sustainable, livelihood-enhancing resource base are essential for both climate change adaptation and mitigation. These activities address the challenges raised by climate change, such as desertification, soil erosion, floods and droughts while contributing to the sequestration of carbon into the soil.

In the course of its history, WFP has become the leading forester of the developing world by contributing to the planting of more than 5 billion trees in dozens of countries using cash or food based employment programmes targeted at food insecure communities.

WFP's deep field presence and extensive network have important implications for the organization and for those it serves. In many situations, WFP may be one of the few – and sometimes the only – international organization present in remote areas which often are the areas where the most vulnerable populations live. This field base enables WFP to ensure that assistance gets to the people who need it in a timely manner. It also gives WFP a privileged understanding of the situation and of the needs of the communities in which it works. In China, for example, a successful strategy that paired food assistance with micro credit provided by IFAD helped hundreds of thousands of people move up the socio-economic ladder, eventually leading to the conclusion of WFP's food assistance programmes in the country.

Examples of WFP Activities Relevant to Climate Change Adaptation and Mitigation in 2007

1. Water Conservation and Management

Water Harvesting and Storage

More than 1,579 ponds constructed or rehabilitated

Afghanistan	Water ponds rehabilitated	Number	167
Uganda	Water ponds constructed	Number	2
Cambodia	Ponds constructed	Number	3
Central African Republic	Fish ponds developed	Number	8
Honduras	Small fish ponds constructed	Number	73
Malawi	Fish ponds completed	Number	7
Mozambique	Fish ponds developed	Number	3
Myanmar	Fish ponds constructed	Number	889
Pakistan	Cattle ponds constructed/rehabilitated	Number	191
Uganda	Fish ponds constructed	Number	173
Zambia	Fish ponds established	Number	63
Ethiopia	Ponds constructed	Cubic metre	95,627

More than 1,571 wells constructed or rehabilitated

Afghanistan	Water wells rehabilitated	Number	732
Central African Republic	Wells dug	Number	2
Cote d'Ivoire	Water wells rehabilitated	Number	14
Djibouti	Wells constructed	Number	13
Guatemala	Wells dug	Number	24
Guinea-Bissau	Wells built	Number	23
Honduras	Water wells rehabilitated	Number	42
Mauritania	Wells constructed	Number	77
Pakistan	Wells constructed/rehabilitated	Number	215
Somalia	Wells constructed/rehabilitated	Number	9
Sudan	Hand-dug wells constructed	Number	11
Zambia	Wells dug	Number	300
Sri Lanka	Wells constructed	Number	109
Bolivia	Community wells constructed	Cubic metre	62,033

More than 160 dams constructed or rehabilitated.

Mauritania	Dams constructed	Number	7
Senegal	Dams built and secured	Number	112
Somalia	Dams constructed/rehabilitated	Number	41
Chad	Dams constructed	Cubic metre	3,173

More than 5,200 water conservation structures built or rehabilitated

Afghanistan	Water Reservoirs Rehabilitated	Number	2,415
Honduras	Rain water harvesting systems	Number	20
Sudan	Water sources rehabilitated or constructed	Number	77
Jordan	Water conservation cisterns constructed	Number	700
Mali	Water conservation structures built/rehabilitated	Number	40
Myanmar	Water conservation structures built/rehabilitated	Number	113
Kenya	Water conservation structures built/rehabilitated	Number	31
Somalia	Water diversion embankments for grazing	Number	718
India	Water harvesting structures constructed	Number	1,042
Uganda	Water tanks provided at school	Number	44
Madagascar	Water retention structure rehabilitated	Cubic metre	713,200
Bolivia	Water reservoirs constructed	Cubic metre	406,635
Kenya	Kilometres of fence for protecting water sources	Km	15
Rwanda	Runoff retention trenches	Hectare	3,135
Chad	Water encatchment constructed	Hectare	50

Irrigation and Drainage Systems

14,305 Kilometres of irrigation systems constructed or rehabilitated and 592 water management and irrigation systems constructed or rehabilitated.

Afghanistan	Canals constructed/rehabilitated	Km	11,459
Armenia	Water/Irrigation pipeline constructed/repared	Km	240
Cambodia	Canals rehabilitated or constructed	Km	6
DPR Korea	Irrigation system constructed	Km	21
East Timor	Irrigation canals constructed	Km	197
Guinea-Bissau	Irrigation canals constructed	Km	34
Indonesia	Irrigation channels constructed	Km	1,327
Madagascar	Irrigation canal rehabilitated	Km	792
Mozambique	Irrigation canals constructed	Km	69
Somalia	Irrigation canals/embankments constructed	Km	3
Sri Lanka	Irrigation canals rehabilitated	Km	157
Bolivia	Small irrigation systems constructed	Number	100
Mauritania	Irrigated perimeters rehabilitated	Number	351
Peru	Small irrigation systems built	Number	89
Niger	Water management works created	Number	16
Tanzania	Water distribution points constructed	Number	36

More than 593 Kilometres of drainage systems constructed or rehabilitated.

Georgia	Drainage channels rehabilitated	Km	456
Guatemala	Drainage channels constructed	Km	14
Sri Lanka	Drainage channels rehabilitated	Km	23
Haiti	Rehabilitated canals/drains	Cubic Metre	53,495

Flood defences and other climate proof infrastructure

For example, 1,621 kilometres of dykes constructed or rehabilitated.

Guatemala	Dykes constructed	Km	1,270
Guinea Bissau	Dykes rehabilitated	Km	305
DPR Korea	Embankment	Km	7
Sudan	Dykes constructed in South Sudan	Km	29
Mauritania	Dykes constructed or rehabilitated	Number	329
Afghanistan	River Sides (Nawars) Constructed	Number	65
Bolivia	Dykes constructed	Cubic metre	138,350
Chad	Dykes rehabilitated	Cubic metre	6,270
Georgia	Protecting gabions constructed	Cubic metre	6,195
Guatemala	Gabions constructed	Cubic km	580
Haiti	Strengthening of river benches	Km	4,500

2. Land rehabilitation and management

Land rehabilitated and made available for agricultural production

169,884 hectares of land protected, cultivated or rehabilitated and made available for agricultural production.

Afghanistan	Land Cultivated	Hectare	17,500
Bolivia	Land rehabilitated	Hectare	7,489
Burkina Faso	Surface of rehabilitated and cultivated	Hectare	2,540
Burundi	Marshlands rehabilitated and land cultivated	Hectare	3,315
Colombia	Land sown or made available for crop production	Hectare	3,186
Congo (Braz)	Land cultivated	Hectare	300
Djibouti	Land cultivated	Hectare	35
DPR Korea	Land reclaimed	Hectare	585
East Timor	Land reclaimed	Hectare	200

El Salvador	Land protected through soil conservation works	Hectare	878
Ethiopia	Area Closure	Hectare	28,292
Gambia	Land cultivated with maize and groundnuts	Hectare	1,015
Georgia	Arable land rehabilitated	Hectare	549
Guatemala	Land protected through soil conservation works	Hectare	589
Guinea-Bissau	Area of land converted for cultivation (tubers, maize, rice)	Hectare	5,067
Honduras	Agricultural land rehabilitated and home gardens	Hectare	4,195
India	Land development	Hectare	3,084
Jordan	Land protected through soil conservation measures	Hectare	532
Kenya	Land reclaimed, protected and cultivated	Hectare	27,834
Liberia	Land cultivated with rice, tubers and legumes	Hectare	2,279
Malawi	Communal gardens and irrigation farming	Hectare	160
Mali	Land protected, cultivated or rehabilitated for grazing	Hectare	1,115
Mozambique	Land cultivated with drought-resistant crops	Hectare	52
Myanmar	Agricultural land developed	Hectare	475
Nepal	Land irrigated/protected/utilised under flood control measures	Hectare	6,089
Niger	Land recuperated from desertification	Hectare	3,620
Philippines	Land cultivated	Hectare	8,349
Russia	Land cultivated in agricultural projects	Hectare	3,117
Rwanda	Marshland reclaimed and cultivated	Hectare	488
Senegal	Mangrove swamps regenerated and cultivated land	Hectare	22,706
Sierra Leone	Small holder tree crop plantations rehabilitated	Hectare	7,881
Somalia	Farmlands protected from erosion	Hectare	779
Sudan	Land cultivated in South Sudan	Hectare	526
Syria	Land converted into farmlands	Hectare	3,506
Tajikistan	Land protected through soil conservation measures		814
Uganda	Woodlots and seed multiplication	Hectare	1,403
Zambia	Land under conservation farming and crop diversification	Hectare	2,340

Land reforested

152.851 hectares of land reforested, resulting in more than 60 million trees planted.

Armenia	Fruit trees (Orchards established)	Hectare	27
Bolivia	Land reforestation	Hectare	1,014
Burundi	Land reforestation	Hectare	432
Guatemala	Land reforestation	Hectare	3
Guinea	Land protected through reforestation	Hectare	312
Guinea-Bissau	Land reforested	Hectare	75
Honduras	Agroforestry	Hectare	334
India	Forest plantation	Hectare	140,362
Mali	Land reforestation	Hectare	10
Mauritania	Land reforested	Hectare	900
Myanmar	Community forests established	Hectare	1,188
Pakistan	Land stabilization through tree plantation	Hectare	1,619
Peru	Area reforested	Hectare	3,232
Senegal	Forest lands protected through reforestation activities	Hectare	3,061
Tanzania	Land conserved through tree planting	Hectare	184

Terracing

Examples include 1,088 hectares of terracing in Peru and Rwanda, 515 terraces built in Rwanda or 2,096 kilometres of anti-erosion terraces in Burundi.

Peru	Terraces constructed	Hectare	169
Rwanda	Hilly land terracing	Hectare	919
Somalia	Stone terraces built against erosion	Number	515
Burundi	Anti-erosive terraces	Km	2,096
Haiti	Soil containment terraces	Cubic metres	27,221
Pakistan	Field terracing and protection walls	Cubic metres	2,384