

**Advancing work on adaptation to climate change
A UN system perspective**

Draft Policy Brief

A N N E X E S

**UN system resources and good practices
in support of adaptation to climate change**

A. Planning and implementation mechanisms

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The UN system and climate change*

Support for adaptation planning and implementation

The NAPA process in the LDCs has generated a lot of success and so its preparation and implementation constitutes an important learning process for other countries and the whole UNFCCC process. Some countries have initiated the development of their own NAPA-like documents so as to address their concerns and vulnerability and their desire to adapt to climate change. The UN system should encourage these efforts in those countries and other developing countries.

NAPAs are not built through original research but on existing studies and information gathered and collated by the NAPA Teams. Accurate, consistent and internationally comparable data is needed to guide the definition and design of measures to adapt to the adverse effects of climate change. The GEF Agencies (UNEP, FAO, IFAD, Regional Banks, etc) and other UN and bi-lateral agencies have **archives of national and global data sets** and can, therefore, assist the LDC Parties access with such archives.

UNDP is currently supporting over 60% of all LDCs with **accessing, designing and implementing adaptation programmes and projects based on the NAPA priorities**. By the end of 2009, UNDP is expected to have commenced implementation of more than 12 countries, with a number of others expected to commence implementation in early 2009.

Several UN system institutions and agencies, including the World Bank, UNDP, UNFCCC and the UN Regional Commissions, are working to assist countries in **evaluating and assessing the costs of implementing adaptation strategies and measures**.

The UNFCCC facilitates the work of the **Least Developed Countries Expert Group (LEG)**, the organization of workshops, collaboration with bilateral and multilateral support programmes, the dissemination of information through participation in regional workshops and expert group meetings, promoting information exchange, and capacity-building. The secretariat provides regular reports to the UNFCCC Bodies on these activities. These efforts by the UNFCCC Secretariat are relevant and, with the continued collaboration and cooperation with other stakeholders, would continue to promote the LDC NAPA.

UNDP, with funding from the Government of Japan, and in partnership with WFP, UNICEF and UNIDO, recently launched a new programme that uses an innovative approach to **climate change adaptation in Africa**. The programme will assist 21 African countries in implementing integrated and comprehensive adaptation actions and resilience plans. The projects will ensure that national development processes incorporate climate change risks and opportunities to secure development gains under a changing climate. They will help countries establish an enabling environment and develop the capacity required to design, finance, implement, and monitor long-term and cost-effective adaptation policies and plans.

Economics of Adaptation to Climate Change: The World Bank is working with seven pilot countries—Bangladesh, the Plurinational State of Bolivia, Ethiopia, Ghana, Mozambique, Samoa and Vietnam on a new study—the Economics of Adaptation to Climate Change. The study is funded by the Governments of the United Kingdom, Netherlands, and Switzerland and will help inform the international community's efforts to provide new and additional resources to developing countries through a better understanding of the global costs of adapting to climate change. It will also help

decision makers at the national level to better cost, prioritize, sequence and integrate robust adaptation strategies into their development plans and budgets in a context of high uncertainty, competing needs and limited financial resources. <http://beta.worldbank.org/content/economics-adaptation-climate-change-study-homepage>

UNEP has implemented, in partnership with McKinsey & Company and others, a GEF project on **economics of adaptation** to identify the cost-effectiveness options for decision-making on adaptation. It has covered cases in China, India, Mali, Guyana, UK, USA, Samoa and Tanzania. The report “Shaping climate-resilient development” will be presented at COP15. UNEP has also been working on the Adaptation Cost in Africa under the Norway-UNEP partnership, and presented its key findings to the African Ministers’ Conference on Environment (AMCEN).

Regional support for national adaptation plans: Each of the UN regions has developed regional and sub-regional climate change strategies, with the help of the five UN Regional Commissions. For example, ESCAP and ECLAC are assisting their Member States with the preparation of disaster risk reduction strategies and preparedness measures. This is of critical importance since Asia and the Pacific and the Latin American and Caribbean regions are the hardest hit by weather related events, including the increasing occurrence of cyclones and hurricanes which have had devastating effects upon these regions in recent years.

- ECA, jointly with the African Union Commission (AUC) and the African Development Bank (AfDB), in collaboration with the Secretariat of the Global Climate Observing System (GCOS) is supporting its Member States with the development of Regional Programme on Climate Change called “*Climate for Development in Africa*” (*Climdev-Africa*). ClimDev-Africa will facilitate the development of policies, practices, services, observation networks and communication with stakeholders to enable effective management of the response to climate change in Africa through: strengthening of solid science and observational infrastructure, enabling strong working partnerships between government institutions, private sector, civil society and vulnerable communities; creating and strengthening knowledge frameworks to support and integrate the actions required.
www.uneca.org/eca_programmes/sdd/events/climate/climdev.pdf
- The ECE is supporting its Member States through adaptation strategies related to outdated housing and infrastructure, including transportation infrastructure in the Eastern European countries that are particularly vulnerable to harsh weather conditions in the winter.
<http://knowledge.uneca.org/member-states/observatory-on-regional-integration/harmonisation-of-sectoral-policies/harmonisation-of-sectoral-policies-climate/climdev-africa-climate-information-for-development-in-africa/africa-climate-policy-centre-acpc>
- ESCWA is also assisting Member States with strategies and programmes to confront water and food scarcity as a result of the land degradation and desertification that affects Arab countries. ESCWA coordinates with the League of Arab States and UNEP/ROWA to address climate change issues in the region through the Arab Climate Change Framework Strategy. Within the thematic areas of concentration established by the HLCP, ESCWA focuses on issues related to adaptation (particularly with regards to water resources management), capacity building and technology transfer.
<http://www.escwa.un.org/rcg/doc.asp?meetingNUM=12>
- Additionally, the UN Regional Commissions facilitate regional consultation processes to share information about policy options for mitigation and adaptation to climate change, and to develop regional perspectives on the post-2012 framework. They also facilitate inter-agency coordination on substantive issues, such as policy analysis and normative options on climate change, through

the Regional Coordinating Mechanisms, which they convene. The Regional Commissions are also undertaking important work on statistics related to climate change.

<http://www.un.org/regionalcommissions/>

Toolkit for Designing Climate Change Adaptation Initiatives: This toolkit, produced by UNDP, incorporates lessons learned by UNDP over the last 4 years of designing adaptation initiatives at different scales (national, sub-national and local) for both multilateral and bilateral funding sources. With the emergences of new funding mechanisms such as the Adaptation Fund, it is hoped that this toolkit will assist countries to design adaptation initiatives that are monitorable, reportable and verifiable. The toolkit will be officially launched at the end of the year.

Report on Climate Change and Tourism - Responding to Global Challenges: Commissioned to an international team of experts by the World Tourism Organization (UNWTO), the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO), it reflects the importance attached by the tourism sector to the impacts of climate change and contains valuable scientific and technical information. The report provides a synthesis of the state of knowledge about current and likely future impacts of climate change on tourism destinations around the world, possible implications for tourist demand and current levels and trends in greenhouse gas (GHG) emissions from the tourism sector. It also gives an overview of policy and management responses of adaptation to climate change and mitigation of tourism's emissions. In addition, in its first part, entitled "The international Debate", the report summarizes the main results of a series of events focused on climate change and tourism, which took place in the second of half of 2007.

<http://www.unwto.org/sdt/news/en/pdf/climate2008.pdf>

Knowledge sharing¹

The Nairobi work programme on impacts, vulnerability and adaptation to climate Change (NWP) is a five-year programme under the Subsidiary Body for Scientific and Technological Advice to the UNFCCC. The NWP plays a significant catalytic role in engaging stakeholders and leveraging actions by its partner organizations around a set of action-oriented work areas on adaptation. It facilitates the sharing of experiences, knowledge and information on current adaptation practices, lessons learned and the identification of needs and gaps to further the understanding of climate change impacts and vulnerability, and to make informed decisions on adaptation policies and programmes. Through a varied array of activities and approaches, the Nairobi Work Programme has engaged a large number of governments, organizations including UN agencies, intergovernmental organizations, research institutions, NGOs, community-based organizations and private sector entries, and has catalyzed a wide range of adaptation actions at the international, regional, national, sectoral and thematic levels.

http://unfccc.int/adaptation/sbsta_agenda_item_adaptation/items/3633.php

Implementation of UNEP's project "Assessment of Impact and Adaptation to Climate Change" (AIACC-I, 2002-2007) has contributed towards bridging the knowledge gaps on climate change impacts and adaptation actions in the most vulnerable regions. Moreover, the project has established global partnership on impact and adaptation assessment, with most relevant technical institutions, in particular those of developing countries. This has paved the way for UNEP to facilitate the development of a **Global Climate Change Adaptation Network** (the Network), which seeks to support the implementation of the Nairobi Work Programme in a synergetic and coherent manner and amplify its impacts in long-term. As it gets further developed, the Network will help meet the increasing knowledge demands for global climate change adaptation efforts with the growing

¹ See also earlier section on "Integrated data collection and analysis"

supplies of world's knowledge, through mobilizing resources and expertise of technical centres, networks and ground facilities. Some 15 UN agencies and organizations, 50 technical institutions and networks at national, regional and international levels, and 40 governments have engaged in its initial process.

Climate for Development in Africa (ClimDev-Africa and its African Climate Policy Center (ACPC)) is a Regional Programme initiated jointly by the African Union Commission (AUC), the UN Economic Commission for Africa (ECA) and the African Development Bank (AfDB), in collaboration with the Secretariat of the Climate Observing System (GCOS). ClimDev-Africa aims at facilitating the development of policies, practices, services, observation networks and communication with stakeholders to enable effective management of the response to climate change in Africa. The Programme is designed for all African countries. It will enhance the response to climate change in the continent by: building solid science and observational infrastructures; enabling strong working partnerships between government institutions, private sector, civil society and vulnerable countries; and creating and strengthening knowledge frameworks to support and integrate the actions required. <http://knowledge.uneca.org/member-states/observatory-on-regional-integration/harmonisation-of-sectoral-policies/harmonisation-of-sectoral-policies-climate/climdev-africa-climate-information-for-development-in-africa/africa-climate-policy-centre-acpc>

The Mountain Partnership, whose Central Secretariat is hosted by FAO, is a global alliance of more than 160 governments, civil society groups and intergovernmental organizations engaged in collaborative action toward sustainable mountain development. The Partnership is working actively to focus attention on the impact of climate change in mountains, which are often affected more quickly and more severely than many other ecosystems. Adverse effects such as melting glaciers and the increased occurrence of natural hazards such as landslides are felt not only in mountain regions, but by many downstream communities, who depend on mountains for fresh water and other important natural resources. The Mt. Partnership provides a mechanism for sharing best practices and building knowledge about adaptation needs and experiences, as well as for developing collaborative activities at the policy and field level in mountain regions.

The World Information and Early Warning System of Plant Genetic Resources for Food and Agriculture (WIEWS). The World Information and Early Warning System is a world-wide dynamic mechanism to foster information exchange among FAO Member Countries, by gathering and disseminating information on plant genetic resources for food and agriculture, and as an instrument for the periodic assessment of the State of the World's Plant Genetic Resources for Food and Agriculture. This mechanism can contribute to exchange information on the role of plant genetic resources for adaptation to climate change.

<http://www.fao.org/agriculture/crops/core-themes/theme/seeds-pgr/wiews/en/>

The Global Network on Prevention and Productive Use of Salt Affected Habitats (SPUSH). The SPUSH Network is a forum that brings together researchers, land users and policy makers. It aims to disseminate information; facilitate the application of technology; contribute to the design of relevant policies and promote focused scientific research. The Network has members from different national, regional and international institutions. With salinization being one of the main impacts of climate change in low lying areas, the Network is very well placed for sharing experiences and information on the prevention and management of salinization.

<http://www.fao.org/agriculture/crops/networks/en/>

The Livestock, Environment and Development initiative (LEAD). The initiative is an inter-institutional consortium with the secretariat located within FAO and financed by different donors. The work of the LEAD initiative focuses on the close and complex interactions between government policies and the environmental impact of livestock production. Its scope is to support the formulation and implementation of effective policy frameworks, at local, national and global levels. To this

effect, LEAD conducts analysis and maintains databases to monitor and estimate the consequences of livestock sector's growth and structural changes. It also identifies technologies to mitigate the negative effects and maximize the positive effects of different modes of production, and assesses ways to enhance their development and adoption.

<http://www.fao.org/agriculture/lead/en/>

The **Technology for Agriculture (TECA) Database** is an FAO initiative that aims at improving access to information and knowledge about available proven technologies in order to enhance their adoption in agriculture, livestock, fisheries and forestry thus contributing to food security, poverty alleviation and sustainable development. The database contains several good practice examples that contributes to climate change adaptation and mitigation in most vulnerable farming systems to climate change impacts.

<http://www.fao.org/teca/>

The **Sustainable Urban Development Network (SUDNet)** and related databases, currently being developed by UN-Habitat largely through its Cities and Climate Change Initiative, increasingly will serve to share knowledge between municipalities and others regarding the urban dimensions of climate change adaptation. SUD-Net supports cities to mobilise partners and networks, build partnerships, implement innovative, pro-poor climate change adaptation action, and stimulate learning and knowledge sharing of good practice. SUD-Net also offers peer-to-peer learning opportunities for urban practitioners in the field of urban climate change adaptation.

<http://www.unhabitat.org/sudnet/>

Adaptation Learning Mechanism (ALM) is an Inter-agency Global Knowledge Platform for pooling and vetting information on climate change adaptation initiatives at the regional, national and local level. ALM seeks to provide easily accessible country specific information on climate change scenarios, examples of impact assessments, strategies, programmes and projects on low-carbon development and climate change adaptation. The platform in particular features lessons learned, practical guidance and good practices on adaptation as contributed by practitioners from the field. The web-based platform was originally launched in 2007 and has been recently enhanced to support interactive, collaborative learning through community of practice around adaptation knowledge sharing. www.adaptationlearning.net.

ICTs for e-Environment - Guidelines for Developing Countries, with a Focus on Climate Change. This report reviews key information and communication technology (ICT) trends and provides an overview of the impact that ICTs have on the environment and climate change, as well as their role in helping mankind to mitigate and adapt to these changes. The report approaches the issues from a development perspective and is based on consultations with key actors and extensive online research. The report also documents current activities and initiatives and makes a set of recommendations for strengthening the capacity of developing countries to make beneficial use of ICTs to mitigate and adapt to environmental change, including climate change.

<http://www.itu.int/ITU-D/cyb/app/docs/itu-icts-for-e-environment.pdf>

The **UNESCO World Network of Biosphere Reserves** (553 sites worldwide in 107 countries) not only promotes knowledge sharing related to climate change adaptation but also provides opportunities for integrated data collection and analysis, integrated land and water management for sustainable ecosystems and enhanced food security, support for adaptation planning and implementation, as well as for developing partnerships and mobilizing resources.

<http://www.unesco.org/mab>

The **UNESCO World Heritage Centre** has promoted knowledge sharing related to climate change and World Heritage properties. A strategy to assist States Parties to implement appropriate management responses and a report on Predicting and Managing the Effects of Climate Change on

World Heritage have been developed and the General Assembly of the UNESCO World Heritage Convention has adopted a Policy Document on the Impacts of Climate Change on World Heritage Properties.

<http://whc.unesco.org/>

The **Frontlines Forum** provides a platform for indigenous or rural communities in small islands, high altitudes, the Arctic, desert margins and other vulnerable environments to share observations, concerns and innovations related to climate change impacts, opportunities and adaptation strategies. The grassroots Frontlines Forum was launched in June 2008 by UNESCO, in partnership with the Secretariat of the Convention on Biological Diversity (SCBD), the Secretariat of the UN Permanent Forum on Indigenous Issue (SPFII) and the Office of the High Commissioner on Human Rights (OHCHR).

<http://www.climatefrontlines.org/>

The **Paris Declaration on Broadcast Media and Climate Change** adopted at the International Conference Broadcast Media and Climate Change: A Public Service Remit organized by UNESCO in partnership UNEP in September 2009, invites the international community and relevant agencies and programmes of the UN, including UNESCO (UNEP), WMO, ITU and the UNFCCC to support all broadcasters, regional broadcasting unions and international broadcasting organizations in meeting the following objectives: to strengthen regional and international collaboration of all broadcasting organizations and concerned professional organizations to optimize the quality and relevance of programming and reporting on climate change; to encourage the production and dissemination of relevant audiovisual content at a local level to give voice to marginalized populations affected by climate change; and to collaborate in raising the skills of broadcast media professionals through training, the exchange of knowledge and best practices, and by facilitating access to relevant scientific information.

http://portal.unesco.org/ci/en/ev.php-URL_ID=28475&URL_DO=DO_TOPIC&URL_SECTION=201.html

The **World Climate Broadcasts Forum on 2 September 2009**, organized by WMO during World Climate Conference-3 (WCC-3), was attended by more than 60 weather broadcasters from around the world was the first ever event involving the many weather broadcasting professional associations, including International Association of Broadcast Meteorology, the Forum International de la Météo, the Climate Broadcasters Network-Europe, the media and the American Meteorological Society. The Forum provided critical insight into the challenges and needs for the communications community to address climate variability and change. Among their recommendations, they stated that communicators must regularly interact with climate researchers, to share the most up-to-date scientific information in a timely manner. They stressed that broadcast meteorologists need to become more fully integrated into the news cycle, working with a range of journalists and communicators. Additionally, all weather broadcasters should have access to training and tools in best practices in communicating climate, and weather broadcasters should take a lead in reaching out to various communities to educate about climate issues.

<http://www.wmo.int/wcc3/>

Hotel Energy Solutions (or Excellence in Energy for the Tourism Industry EETI): Mitigating the contribution of tourism to climate change is a wide ranging issue that is addressed by several of the programmes and initiatives supported by the UNWTO. In this regard, the UNWTO launched in 2008 the project Hotel Energy Solutions, “Excellence in Energy for the Tourism Industry (EETI)” – within the framework of the Intelligent Energy-Europe Programme, and funded by the European Agency for Competitiveness and Innovation. This project focuses on actions to foster energy efficiency and the rational use of energy resources in the accommodation sector. The online training and e-tool currently developed should give hotel Small and Medium Enterprises (SMEs) a better understanding of technologies available to invest in EE and RE. The project is designed to create an

interactive forum in which the accommodation and energy technology providers sectors can meet, exchange and collaborate. It will demonstrate that, as well as reducing CO2 emissions, adopting up-to-date energy technologies can help considerably to boost the accommodation sector's competitiveness and sustainability. Key target groups are therefore: hotel SMEs, hotel associations, national tourism bodies, destinations, tour operators, suppliers and manufacturers in the field of energy efficiency and renewable energy use. Its main goal is to reduce greenhouse gas emissions and costs in the hotel sector in 27 European countries, addressing small and medium size hotels. It also aims to achieve 20% increase in energy efficiency and 10% increase in the use of renewable energy technologies.

<http://www.hotelenergysolutions.net/index.php>

Building partnerships

There are many good practices of multilateral partnerships on which the proposed Global Adaptation Partnership can forge. An immediate example is the **Commission on Climate Change and Development** which comprises government officials and representatives of the science communities, private sectors, IGOs and the UN. It focuses on global adaptation policy and advocates in the highest political and scientific level so far climate change adaptation at all levels. Its landmark publication "Closing the Gaps" has been widely recognized and referenced in the current adaptation negotiations and practices.

The GEF-UNEP-McKinsey/Swiss Re-EC **project on economics of adaptation** is a public-private partnership to bridge the knowledge gaps for better investment on adaptation. It takes a cost-benefit approach to look into adaptation options in most vulnerable sectors in countries at different development stage, and identify the options of most cost-effective investment.

Community Based Adaptation: FAO is implementing community based adaptation projects in agriculture to enhance adaptive capacity of rural populations. The initiatives are community-driven and nationally relevant to provide leverage for up-scaling into similar food production systems. The initiatives takes livelihood centered natural resources management approach, involving a range of capacity building and awareness raising programmes. The process provides opportunities for sharing lessons and best practices and national policy dialogues in food and agriculture. Bringing together the relevant local institutions, social networks, farmers groups and private sector is the key. The Local Facilitation Team (LFT) promoted through this approach provides institutional entry point for social mobilization at the community levels and is capable of development of community based climate risk managements plan.

<http://www.fao.org/climatechange/53598/en/>

The Economic Community of West African States (ECOWAS) has created a system whereby pastoralists from one nation can easily cross the border into another nation for grazing purposes without experiencing legal problems. In the ECOWAS system pastoralists receive a 'livestock passport' along with an 'international transhumance certificate,' and a 'handbook of travel.' (**Global Livestock Collaborative Research Support Program** (GL-CRSP), 2004). Maintaining pastoral mobility will be a vital part of adaptation. A pastoral passport can provide an opportunity for pastoral communities to cross borders for grazing, without experiencing legal and bureaucratic difficulties.

<http://crsps.org/2007CRSPModel.pdf>

Caring for Climate: Pursued through the UN Global Compact this initiative represents a commitment to action by business and a call to governments, incorporating transparency. Endorsed by more than 360 companies from 65 countries, Caring for Climate assists companies in the development of effective climate change policies, while also providing a channel for the business

community to contribute inputs and perspectives to key governmental deliberations.
http://www.unglobalcompact.org/Issues/Environment/Climate_Change/index.html

The Tour Operators' Initiative for Sustainable Tourism Development (TOI): Funded in 2000 by a group of tour operators, with the backing of UNEP, UNESCO and the World Tourism Organization (UNWTO), which currently hosts the Secretariat, the TOI is an international alliance of tour operators fully engaged in advancing sustainable tourism. With regard to climate change mitigation policies, members of the TOI seek ways for tourism constituents, including tourists themselves as well as providers, to both adapt to climate change related challenges and mitigate GHG emissions. Reduction of energy consumption and improvement of energy efficiency in tourism establishments are recommended and the results achieved are regularly monitored through checklists. Customers are encouraged to decrease and prevent pollution and waste during their holidays and are informed through awareness campaigns, websites, activities, posters and brochures. Many of the TOI member companies also offer their customers the opportunity to offset carbon emissions generated by their air travel by making a contribution to climate protection projects at destinations. The TOI has been also developing manuals on sustainable tourism in deserts and mountainous areas where climate change mitigation measures are strongly recommended as poorly planned and implemented tours and tourist activities can have a serious impact on these fragile ecosystems, as well as on their communities.
<http://www.toinitiative.org>

The Davos Process: Following the Second International Conference on Climate Change and Tourism, held in Davos, Switzerland (October 2007), the World Tourism Organization (UNWTO) initiated what was called the Davos process. It is aimed at engaging all tourism stakeholders in the context of the United Nations response to climate change. The Davos Declaration acknowledged the strong interrelationship between tourism and climate change and recognized the need of a long term strategy for the sector to reduce its greenhouse gas emissions in line with other sectors. Within the process, the UNWTO calls for urgent adoption of a range of policies to encourage sustainable tourism and travel patterns that take into account climate responsiveness. UNWTO leads initiatives in response to this global challenge, focusing on four key actions: mitigation, adaptation, application of new technologies and secure financial resources.
<http://www.unwto.org/climate/index.php>

Integrated data collection and analysis

Global Climate Observing System (GCOS) includes the climate observing components of the Global Terrestrial Observing System (GTOS) and the Global Ocean Observing System (GOOS): The GCOS Secretariat, with the assistance of its Panels, is supporting the observational requirements of the UNFCCC. In particular GCOS is developing possible mechanisms for a framework and facilitates the implementation of the Essential Climate Variables (ECVs), including the assessment of the status of available standards. The Implementation Plan for a Global Observing System for Climate in Support of the UNFCCC and the Progress Report on the implementation of a climate observing system has been acknowledged by the SBSTA. The terrestrial, oceanic and atmospheric ECVs were originally identified in the implementation plan developed by GCOS and its partners as the observations that are currently feasible for global implementation and have a high impact on the requirements of the UNFCCC and other stakeholders. GCOS has been tasked to report to COP 15 on the update of the Implementation Plan and to deliver a cost estimate for the implementation of a climate observation system.
<http://www.gosic.org/ios/GCOS-main-page.htm>

Climate Monitoring: Through the WMO Commission for Climatology (CCI) and in cooperation with its Members, WMO has been issuing annual statements on the status of the global climate over the last 13 years. These statements document the extreme weather and climate events in the regional context, and provide a historical perspective on the variability and trends of surface temperatures that have occurred since the nineteenth century. WMO is also working with the National Meteorological and Hydrological Services (NMHSs) to develop climate change detection tools and software to compute indices that reflect the best estimate of climate trends within the countries. Through capacity building activities based on up-to-date knowledge and software, WMO assists developing countries and Least Developed Countries to follow quantitative and objective approaches for their contributions to the IPCC process and reporting to the UNFCCC. A group of experts within the commission for Climatology of WMO jointly with Environment Canada have developed 27 core indices to detect climate variations. The statistical software is very simple and user friendly.
http://www.wmo.int/pages/prog/wcp/wcdmp/wcdmp_home_en.html

Climate Data Management Systems: WMO's World Climate Data and Monitoring Program (WCDMP) provides the platform for collaboration among NMHSs in climate data and metadata collection, quality control and management. It ensures that climate data are readily available to and among nations. It also develops standards and guidance on best practices for the quantity, quality and timeliness of climate data required for use in modeling climate processes and, monitoring and assessing climate variability and change and their impacts. Based on the WMO/WCDMP leading role in the capacity building, climate data management is an area where NMHSs contribute significantly through the development of modern Climate Data Management Systems (CDMSs) to enable prompt and adequate response to the users in their needs and requirements for climate data. Plans are under way to modernize the infrastructure in at least 40 countries during the period 2008-2011, with a particular focus on developing countries and LDCs. This will be in addition to the 50 countries in which the CDMS have been already installed during the period 2004-2007.
http://www.wmo.int/pages/prog/wcp/wcdmp/wcdmp_home_en.html

Climate Watch System: Weather extreme events such as hurricanes, thunderstorms, tornadoes, etc. require weather watches for which most NMHSs issue early warnings and undertake special monitoring. In a similar manner, 'climate watches' deal with climatic extremes like heavy monsoons, flooding, cold waves, heat waves, droughts, etc., which require long-term monitoring with historical observations and its integration into the context of global climate patterns. By incorporating recent climate analysis as well as outlooks, climate watches serve as advisories and forewarnings of climate anomalies, therefore enable continuous and timely climate related risk assessment and management to avoid damages to life and property. The necessary mechanisms have already been put in place in some parts of the world, e.g. the North American Drought Monitor, the ICPAC (Inter-Governmental Authority on Development Climate Prediction and Applications Center) and SADC (Southern African Development Community) Drought Monitoring Centers in Africa. WMO works with NMHSs and many institutions in the world to issue regional climate watch bulletins.
http://www.wmo.int/pages/themes/climate/climate_watch.php

ClimDev: The Climate for Development in Africa Programme (ClimDev Africa), the first major follow-up initiative to the GCOS Regional Workshop Programme, was envisaged originally as an initiative to mobilize the resources needed in Africa to implement the several GCOS Regional Action Plans (RAPs) for African subregions. In working with development partners, however, as well as with sectoral users of climate information, this has evolved into an integrated programme addressing needs in four separate but associated areas: climate observations, climate services, climate risk management, and national policies related to climate in Africa. The ultimate objective of the programme is to promote sustainable development and achievement of the Millennium Development Goals (MDGs) through better management of climate risks.
<http://www.wmo.ch/pages/prog/gcos/index.php?name=ClimDevAfrica>

The Climate Information and Prediction Services (CLIPS) project is an effective framework within which regional climate change information and the associated adaptation issues can be integrated. Development of training curricula, training workshops and regional showcase projects, which are key components of CLIPS, need substantial resource mobilization to cater to the growing needs of climate information providers as well as user sectors, particularly in the developing countries and the Least Developed Countries.

<http://www.wmo.int/pages/prog/wcp/wcasp/CLIPSIntroduction.html>

Regional Climate Outlook Forums (RCOFs) are one vehicle for development of user-driven products and services, which were successful in various regions in attracting the interest and support of sectoral user groups in development and dissemination of seasonal climate predictions and related products. RCOFs constitute an important vehicle in developing countries for providing advanced information on the future climate information for the next season and beyond, and for developing a consensus product from amongst the multiple available individual predictions. RCOFs are regularly convened twice a year in the sub-regions Western Africa, Greater Horn of Africa, Southern Africa, Southeastern South America, West Coast of South America and Central America, and once a year in Asia. The RCOFs have also developed partnerships with the core sectors like agriculture, health, water, etc. with active media participation.

http://www.wmo.int/pages/prog/wcp/wcasp/RCOF_Concept.html

http://www.wmo.int/pages/prog/wcp/wcasp/clips/outlooks/climate_forecasts.html

<http://www.wmo.int/pages/prog/wcp/wcasp/RCOFReview2008.html>

The World Climate Research Programme (WCRP) jointly sponsored by WMO, UNESCO/IOC, and ICSU, since 1993 plans, organizes and conducts the scientific research on climate system. WCRP-coordinated research and modelling results underpin IPCC assessments. The WCRP objectives are to determine the predictability of climate and to determine the effect of human activities on climate. WCRP organizes and coordinates model development, climate model simulations and understanding of the climate system for the detection and attribution of past climate change, and the provision of climate information, including projections of future change based on various emission scenarios. WCRP, WMO's World Weather Research Programme and the International Geosphere-Biosphere Programme jointly develop an enhanced climate, weather, water and environmental prediction framework to accelerate weather, climate and earth system prediction research and improve assessments.

<http://wcrp.wmo.int/wcrp-index.html>

Global Framework for Climate Services (GFCS) established by the World Climate Conference-3 (Geneva, 31 August to 4 September 2009), will ensure the provision of science based reliable, useful and timely climate information needed by the governments and society in general for adaptation and climate risk management. It is built upon the enhanced capacity of National Meteorological and Hydrological Services and their national partner institutions engaged in climate related activities, to enable them to take active and effective part in the development of climate information and products at global, regional and national level; deliver climate services at the national level within the mandated national arrangements in collaboration with partners; and work with intermediary agencies in different sectors to help support effective application of these services.

<http://www.wmo.int/hlt-gfcs>

Climate Change Country Profiles have been developed as part of the UNDP national Communications Programme. They aim to provide a set of country-level climate information to support Vulnerability and Adaptation (V&A) studies as part of the development of the Second National Communications. As part of this project, fifty-two country profiles for non Annex I countries were developed in order to produce an 'off the shelf' analysis of climate data. Information includes historic trend data and projected future changes data using outputs from the most up to date

Global Climate Model (GCM) experiments and robust analytical tools. Maps, diagrams and summary tables of the data are also provided for each country. <http://country-profiles.geog.ox.ac.uk/>.

GRUMP (Global Rural-Urban Mapping Project), Low Elevation Coastal Zones and Drylands:

GRUMP provides an urban-rural disaggregation and categorization of georeferenced global population. The project was developed out of a need for researchers to be able to distinguish population spatially by rural and urban areas. GRUMP researchers have been able to apply population data to local areas overlaid with geographic assessments of risk, including risk from sea level rise in low elevation coastal zones and drought in drylands associated with climate change. GRUMP represents the only comprehensive dataset on which global analysis of population-climate linkages can be spatially examined.

Global Urban Observatory: Cities represent concentrations of populations – especially poor families – that in many cases are highly vulnerable to climate change. UN-Habitat established the Global Urban Observatory (GUO) as a mechanism to monitor global progress in implementing the Habitat Agenda, as well as to monitor and evaluate global urban conditions and trends. This tool already has proved useful in overlaying climate and socio-economic data, with particular attention to urban populations at risk from rising sea levels. Worldwide, for example, the GUO has identified 3351 cities around the world that lie in low elevation coastal zones (LECZs), along with some 384 million persons living in LECZs in urban areas. For more information, see www.unhabitat.org/guo and *State of the World's Cities 2008/2009*.

Emerging social issues and ethical challenges posed by global climate change: The UNESCO Strategy for Action on Climate Change addresses the social and ethical implications of climate change, with particular reference to migration, and the legacy of the International Polar Year campaign. In this context and following a series of consultations including with other UN agencies, UNESCO will explore the advisability of preparing a draft universal declaration of ethical principles in relation to climate change.

<http://unesdoc.unesco.org/images/0016/001627/162715e.pdf>

FAO's combination of socio-economic/climate datasets on food security (FAOclim 2.0, CLIMWAT 2.0, FAOSTAT, Global Agro-Ecological Zones)

FAOclim 2.0 is a global agro-climatic database containing data from almost 32,000 stations for up to 14 observed and computed agro-climatic parameters. The database includes both long-term averages (1961-90) and time series for rainfall and temperatures. The database is linked to real-time daily meteorological data flow and allows users to browse and retrieve basic data. The user can select data by geographic area, time period and parameter and can export and visualize the information in map and graph form. (http://www.fao.org/nr/climpag/pub/en1102_en.asp)

CLIMWAT 2.0 is an extensive climatic database of more than 5,000 stations worldwide which is directly linked to the irrigation model AQUACROP. The combination of both allows users to calculate crop water requirements, irrigation supply and irrigation scheduling for various crops for a range of climatological stations. (http://www.fao.org/nr/water/infores_databases_climwat.html)

FAOSTAT provides time-series and cross sectional data relating to food and agriculture for some 200 countries. The national version of FAOSTAT, CountrySTAT, is being developed and implemented in a number of target countries, primarily in sub-Saharan Africa. It will offer a two-way data exchange facility between countries and FAO as well as a facility to store data at the national and sub-national levels. (<http://faostat.fao.org/>)

Climpag: FAO provides a wide range of data and tools for assessments of climate change impacts and vulnerabilities, and adaptation and mitigation planning related to agriculture and food security. As per FAO basic texts, the word agriculture includes crops and grasslands, livestock husbandry, forestry and fisheries. Climpag is aimed at bringing together the various aspects and interactions between weather, climate and agriculture in the general context of food security. Climpag contains

methodologies, tools for a better understanding and analysis of the effect of the variability of weather and climate on agriculture as well as data and maps.

http://www.fao.org/nr/climpag/about_en.asp

Agri-environmental hotspots: Agri-environment hotspots are locations where human activities are detrimental to the sustainability of an ecosystem or the human activities depending on it. Hotspots are a critical threshold on a continuous scale ranging from “natural environment” to “fire points”. If no corrective action is taken, they may gradually evolve into extremely tense socio-economic situations associated with a severe degradation of the natural resources base and food security. In order to provide a global, real-time and qualitative warning of current and future agricultural emergencies, Agroclimatic Hotspots maps will indicate areas where excess or deficit over the expected rainfall is likely to produce serious damage to rainfed agriculture or pastures.

http://www-data.fao.org/nr/climpag/hot_1_en.asp

Crop monitoring and forecasting: Analysis of meteorological and climatic data allows providing near real-time information about the crop state, in quality and quantity, with the possibility of early warning on alarm/alert situations so that timely interventions can be planned and undertaken. Crop forecasting philosophy is based on various kinds of data collected from different sources: meteorological data, agro-meteorological (phenology, yield), soil (water holding capacity), remote-sensing and agricultural statistics. Based on meteorological and agronomic data, several indices are derived which are deemed to be relevant variables in determining crop yield, for instance crop water satisfaction, surplus and excess moisture, average soil moisture, etc. FAO supports Food Security Information for Action Programme, Agro-meteorological crop forecasting and calculation of length of the growing season by region.

WFP’s Vulnerability Analysis and Mapping (VAM): Through VAM, WFP conducts Comprehensive Food Security and Vulnerability Analyses in more than 30 countries. They help the organization, governments, and other stakeholders identify the most food insecure and vulnerable populations and the nature and causes of their vulnerabilities – including unfavourable climatic conditions. In 2008 the number of VAM assessments increased by 80 per cent. WFP has recently signed an MOU with the World Meteorological Organization (WMO) which aims at bridging the gap between providers of climate information and those in need of it by combining more effectively top-down climate information and bottom-up analyses based on climate information, such as VAM.
www.wfp.org/food-security

WFP Comprehensive Food Security and Vulnerability Analysis (CFSVA): It provides an in-depth picture of the food security situation and the vulnerability of households in a given country. It is conducted in countries subject to recurrent crises. A CFSVA provides a breadth of information on the political, socio-economic and agro-ecological context, food supplies, markets, livelihoods, coping strategies, nutrition, health, education, etc. The analysis identifies the root causes of food insecurity and vulnerability; provides an in-depth profile of food-insecure and vulnerable people, and their livelihoods; provides an analysis of markets, their functioning and price trends in the country; includes an analysis of risk (hazards, natural disasters, economic shocks, etc) and their potential impact on the most vulnerable. This type of analysis is also referred to as pre-crisis baseline study, as it is conducted at normal times, and not during a crisis. Knowing where the most vulnerable people are located and what causes their vulnerability facilitates the drawing-up of the first emergency needs assessments after a crisis strikes. Since 2004, WFP has completed more than 35 baseline surveys worldwide.

www.wfp.org/food-security

WFP / FAO Crop and Food Security Assessment Mission (CFSAM): It is undertaken by FAO and WFP, usually for emergencies related to agricultural production or overall food availability problems. It assesses the seriousness of a crisis situation, by looking at the food produced nationally

and the extent to which poor people can meet their basic food needs. A CFSAM analyses the food security situation at two different levels. At the macro level, the mission analyses the overall economic situation, agricultural production and market conditions, and the supply and demand situation for staple foods. It estimates the uncovered staple food import requirements for the coming year. At the micro level, the mission analyses the way households access food (for example through their own production, or buying food on the markets). It makes estimates of the access shortfalls and assistance that will be required.

<http://www.wfp.org/food-security/reports/CFSAM>

WFP Emergency Food Security Assessment (EFSA): It analyses the impact of a crisis on the food security of households and communities. An EFSA is conducted when a natural disaster, a conflict or an economic shock causes population displacements and food insecurity. An assessment can be triggered by a sudden event such as an earthquake or a flood. It can be by a slow onset crisis, for example a progressive deterioration of the economic situation. An EFSA includes a forecast of how the situation may evolve and an analysis of possible food and non-food responses. The EFSA can be in the form of an initial (6 to 10 days after the crisis), rapid (3 to 6 weeks after the crisis) or an in-depth (6 to 12 weeks) assessment.

www.wfp.org/food-security

WFP Food Security Monitoring System (FSMS): It monitors changes in people's food security situations. It aims to alert the humanitarian community when a situation deteriorates and to ensure that assistance can be provided in a timely and appropriate way. For example, an FSMS collects information on individual households' food consumption, their income and the strategies they develop to cope with difficult situations. It also monitors market prices and rainfall patterns.

<http://www.wfp.org/food-security/reports/FSMS>

Livelihood Early Assessment Protection (LEAP): WFP and the World Bank, together with the Government of Ethiopia, have developed LEAP, a software that, building on crop models expertise of FAO, allows users to monitor livelihood stress related to drought and flooding for populations dependent on rain-fed agriculture and to estimate the financial magnitude of the livelihood-saving interventions needed in the event of a weather shock. LEAP conveys information in near real-time to ensure that the response to drought-related livelihood crises will be more timely and effective. The tool is being used to guide disbursements of up to \$ 180 millions to scale-up Ethiopia's Productive Safety Net Programme to deal with additional shock-affected beneficiaries. It is also the basis for an innovative weather-based insurance project in Ethiopia which transfers drought risk to international re-insurance markets.

Regional Early Warning Systems: WFP has also developed the regional Early Warning System for Central America, known as SATCA, which has been developed in partnership with international scientific institutions (i.e. NASA, NOAA), regional institutions (CEPREDENAC, SICA), national entities and UN partners.

<http://www.satcaweb.org>

UPU's Global Greenhouse Gas Overview and Mitigation Project (GGOM): Launched in June 2008, the GGOM aims to establish a regional mapping of greenhouse gas emissions due to postal activities and thus to estimate the impact of the postal sector on climate change. In this regard, the UPU sought the expertise, support and endorsement of the United Nations Environment Programme (UNEP), with which it signed a cooperation agreement in 2008. With a guide detailing the methodology to produce a carbon inventory, regional seminars dealing with the fight against climate change, and the establishment of a sector-specific tool for calculating emissions, all those based on UNEP's tools, the UPU wants to engage and inform its members. The UPU wishes to carry out this exercise in cooperation with key partners. Assessing emissions is a first step. Almost 100 countries are already taking part in the project. The GGOM, whose objective is also to encourage member

countries and their designated operators to reduce their carbon footprint, will help, in a second phase, to implement the measures to achieve this goal.

http://www.upu.int/climate_change/en/index.shtml

Weather and Climate Information for Tourism: Commissioned by the World Tourism Organization (UNWTO) and the World Meteorological Organization (WMO) in order to provide background information for the parallel working session on Climate Information for Adaptation and Risk Management in the Transportation and Tourism Sector at the 3rd World Climate Conference in Geneva, Switzerland, this report provides a synopsis of the capacities and needs for climate services in the tourism sector. It is organized in three different sections. The first provides an overview of climate information providers and various delivery pathways of climate information to the end-users within the tourism sector. The second section summarizes the wide range of current and potential uses of climate information by the diverse tourism sector end-users and key entry points into user decision making. Section three discusses key knowledge gaps, research and capacity building needs, and partnerships that are required to accelerate the application of climate information to manage risks to climate variability and facilitate successful adaptation to climate change.

http://www.unwto.org/climate/support/en/pdf/WCC3_TourismWhitePaper.pdf

United Nations Statistical Commission has undertaken a Programme Review of Climate Change and Official Statistics (E/CN.3/2009/2, <http://unstats.un.org/unsd/statcom/doc09/2009-2-ProReview.pdf>). The Review highlights the important role that national statistical offices (NSOs) play at a national level in providing statistical information for climate change related monitoring and analysis, either by making better use of existing statistics or identifying the gaps and the ways to fill them. The work at the international level aims to ensure that standards and methodologies can best support climate change analysis, and respond to the statistical needs of the relevant international policy bodies. The Review lists three roles for official statistics in relation to climate change: (a) To provide the best available data for use in climate change assessment, policy and decision making, including relevant statistical data for input into greenhouse gas emissions inventories and climate change models; (b) To ensure that climate change aspects are considered in the development and maintenance of statistical standards and that these standards are promulgated outside official statistics; (c) To develop and advocate statistical tools for the integration of economic, social and environmental information to support the analysis of the causes and impacts of climate change and related policy measures.

The **UNECE** Statistical Division is planning to undertake work on promoting the development of official climate change statistics in the region taking into account the activities of Intergovernmental Panel on Climate Change (IPCC), United Nations Framework Convention on Climate Change (UNFCCC), and other institutions dealing with related data.

<http://unstats.un.org/unsd/statcom/commission.htm>

WMO-ITU Handbook: ITU-R Study Group 7 (Science services), in cooperation with the World Meteorological Organization, produced the WMO and ITU Handbook "Use of Radio Spectrum for Meteorology: Water, Weather and Climate Monitoring and Prediction" (see

<http://www.itu.int/publ/R-HDB-45/en>) providing information on development and a proper use radiocommunication systems and radio-based technologies for environment observation, climate control, weather forecasting and natural and man-made disaster prediction, detection and mitigation.

For more information on radio communications and climate change see:

<http://www.itu.int/ITU-R/index.asp?category=information&rlink=climate-change&lang=en>

WMO Information System (WIS) and Global Telecommunication System (GTS) ensure operational real-time global collection and dissemination of data from observations taken at stations worldwide to disaster warnings. It integrates various data transmission and collection platforms including satellites and other remote transmission techniques and it is supported by the ITU-regulatory framework.

http://www.wmo.int/pages/themes/wis/index_en.html

Second IMO GHG Study 2009: The study is the most comprehensive and authoritative assessment of the level of GHG emitted by ships and the potential for reduction. Furthermore, the study evaluates the different policy options for control of GHG emissions from ships currently under consideration within IMO and other organizations. It has become the IMO Marine Environment Protection Committee's paramount reference for information in developing IMO's strategy to limit and reduce GHG emissions from international shipping. The work has been undertaken by an international consortium of renowned research institutes with particular expertise within their respective fields.

http://www.imo.org/home.asp?topic_id=1823

LIST OF ACRONYMS

CBD - Convention on Biological Diversity
CDM - Clean Development Mechanism
CEB - United Nations System Chief Executives Board for Coordination
COP - Conference of the Parties
FAO - Food and Agriculture Organization of the United Nations
GCOS - Global Climate Observing System
GEF - Global Environment Facility
HLCP - High Level Committee on Programmes of the CEB
IAEA - International Atomic Energy Agency
ICAO - International Civil Aviation Organization
IFAD - International Fund for Agricultural Development
ILO - International Labour Organization
IMO - International Maritime Organization
IMF - International Monetary Fund
IPCC - Intergovernmental Panel on Climate Change
ITU - International Telecommunication Union
LDCs - Least Developed Countries
MDGs - Millennium Development Goals
NAPAs - National Adaptation Programmes of Action
OHCHR - Office of the High-Commissioner for Human Rights
REDD - Reduction of emissions from deforestation and degradation
SIDS - Small Island Developing States
UN - United Nations
UNAIDS - Joint and Co-sponsored UN Programme on HIV/AIDS
UNCCD - UN Convention to Combat Desertification
UNCG - UN Communications Group
UNCTAD - United Nations Conference on Trade and Development
UN-DESA - UN Department of Economic & Social Affairs
UNDG - UN Development Group
UNDP - United Nations Development Programme
UN-ECE - UN Economic Commission for Europe
UN-ECA - UN Economic Commission for Africa
UN-ECLAC - UN Economic Commission for Latin America and the Caribbean
UNEP - United Nations Environment Programme
UN-ESCAP - UN Economic and Social Commission for Asia and the Pacific
UNESCO - United Nations Educational, Scientific and Cultural Organization
UN-ESCWA - UN Economic and Social Commission for Western Asia
UNFCCC - UN Framework Convention on Climate Change
UNFPA - United Nations Population Fund
UN-HABITAT - UN Human Settlements Programme
UNHCR - Office of the United Nations High Commissioner for Refugees
UNICEF - United Nations Children's Fund
UNIDO - United Nations Industrial Development Organization
UNIFEM – United Nations Development Fund for Women
UNISDR - UN International Strategy for Disaster Reduction
UNITAR - United Nations Institute for Training and Research
UN-OCHA - UN Office for the Coordination of Humanitarian Affairs
UNRWA - United Nations Relief and Works Agency for Palestine Refugees in the Near East
UNU - United Nations University
UNWTO - World Tourism Organization
UPU - Universal Postal Union
WB - The World Bank
WFP - World Food Programme
WHO - World Health Organization
WIPO - World Intellectual Property Organization
WMO - World Meteorological Organization
WTO - World Trade Organization