

A photograph of a person in a red and black long-sleeved shirt and dark pants, wearing a head covering, watering small green plants in a dry, brown field. The person is holding a metal watering can and pouring water onto the plants. The background shows a dry landscape with some bushes and a tent-like structure. The text 'Weather, Climate and Water Services for the Least Developed Countries' is overlaid in white on the right side of the image.

Weather, Climate and Water Services for the Least Developed Countries



**World
Meteorological
Organization**
Weather • Climate • Water

The **WMO Programme for the Least Developed Countries** (LDCs) was established in 2003 in response to the call of the Third United Nations Conference on LDCs to its agencies to play a key role in the implementation of the Programme of Action for the Least Developed Countries for the Decade 2001–2010, adopted in Brussels in 2001, and the Millennium Declaration. One of the principal aims of the WMO programme is to enhance and strengthen the capacities of the National Meteorological and Hydrological Services (NMHSs) of LDCs so that they can meet the following national, regional and global needs in relation to weather, climate and water:

- Observing, monitoring, recording and reporting on weather, water resources, climate and the related natural environment;
- Providing beneficial weather, water, climate and related environmental services to the public, governments and other sectoral users;
- Delivering accurate and reliable warnings of severe events related to weather, climate, water and the natural environment, and ensuring that NMHSs reach their target audience (individuals, emergency services, decision makers) in a timely and useful way.

WMO, through its various scientific and technical programmes (see box below) and network of regional training and specialized centres, supports many programmes in LDCs that are linked to the commitments enshrined in the Brussels Programme of Action and the Millennium Declaration, especially poverty reduction, disaster reduction and mitigation, food security, energy and water resources management, environmental monitoring and protection and health.

Through this support, NMHSs play a role in national development. However, most NMHSs in LDCs have been hampered by weak infrastructures, the inability to provide basic services and an overall lack of resources to meet these development objectives.

Most of the commitments of the Brussels Programme of Action will not be fully met without the appropriate use of available knowledge and information on weather, climate and water. Furthermore, sustainable development efforts in LDCs will be undermined without a proactive approach to risk management of highly variable elements such as weather, climate and water. Risk management of these elements should therefore be incorporated into the development policies and strategies of LDCs because of their strong impact on the lives of the poor, especially those who depend on agriculture for livelihood



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and sustenance; are unprotected against climate-related diseases such as influenza, diarrhoea, cholera, meningitis, dengue and malaria; lack secure access to water and food and are vulnerable to weather-, climate- and water-related hazards.

In implementing the **WMO Programme for the LDCs**, NMHSs will help their communities reduce risk through the use of weather, climate and water products and services effectively in their daily activities.

HOW CAN WMO CONTRIBUTE TO THE DEVELOPMENT OF LDCs?

The **WMO Programme for the LDCs** aims to contribute towards meeting the commitments of the Brussels Programme of Action, which include the following:

Fostering a people-centred policy framework

The commitments of the Brussels Programme of Action revolve around people and the need to provide them with the means to live with dignity. In this respect WMO and NMHSs empower them by providing timely advice and early warnings on weather, climate and water: information on tropical cyclones, floods, droughts, bush and forest fires and on heat waves and cold spells that will

WMO Programmes: World Weather Watch, World Climate Programme, Atmospheric Research and Environment Programme, Applications of Meteorology Programme, Hydrology and Water Resources Programme, Education and Training Programme, Technical Cooperation Programme, Regional Programme and the two crosscutting programmes: the Natural Disaster Prevention and Mitigation Programme and WMO Space Programme.



enable them to protect themselves by taking relevant preventive or mitigation measures. This information is crucial for the formulation of appropriate policies, including the mainstreaming of disaster risk reduction into national development plans and strategies with a view to ensuring sustainable development.

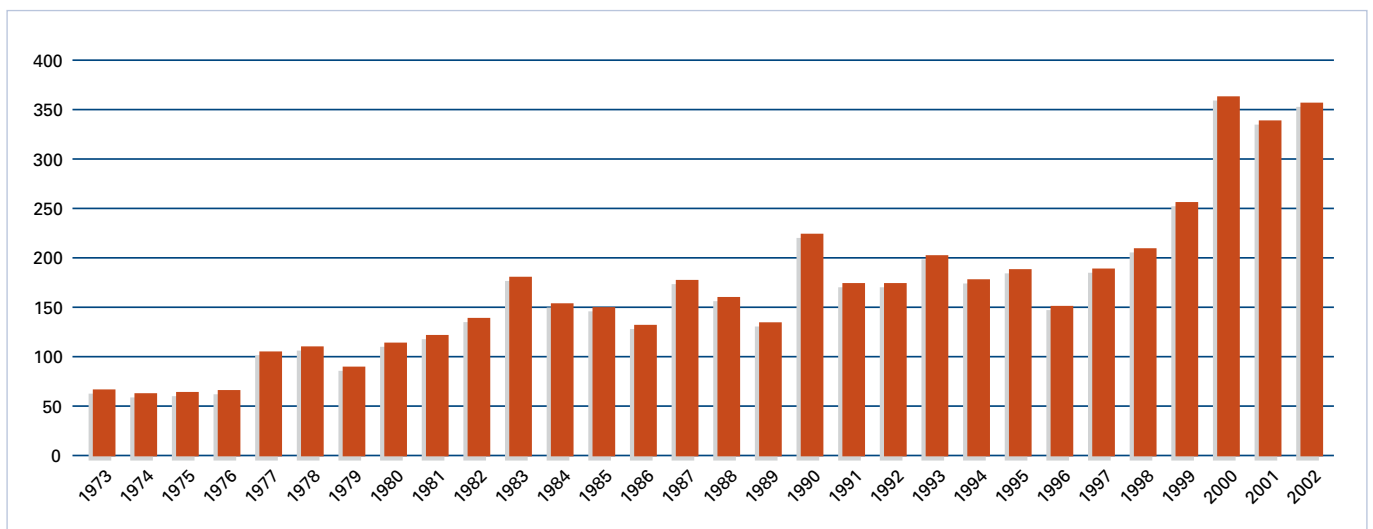
Women in the LDCs are particularly affected by weather, climate and water shocks, owing to the central role they play in agriculture and in their own households. Access to weather, climate and water information empowers them to plan their activities and promotes gender equality. WMO and NMHSs are pursuing this goal by providing capacity-building workshops, education and training, organizing regional and international conferences for women meteorologists and encouraging women to take up careers in meteorology and related sciences.

Strengthening productive capacities

Most LDC economies are based on sectors such as agriculture and tourism that are weather-, climate- and

water-sensitive. The provision of information on present and future weather, climate and water conditions to farmers, tourist, transport and dam operators, for example, will help them make informed decisions and ultimately increase their benefits as a result of more efficient use of available resources.

WMO provides support to NMHSs to generate products and services that are relevant to the various socio-economic sectors and builds capacities for the users to effectively apply available information. The agricultural industry in the LDCs is undercapitalized and by far the least efficient in the world, as it is subject to the vagaries of weather and climate. With low inputs, inadequate irrigation and capital investments and the use of obsolete technologies, it generates low returns for intensive labour investments. Under these conditions the use of weather and climate information is essential in order to maximize returns. The Agrometeorological Pilot Project in Mali, in which the application of climate information resulted in a threefold increase in yields, is a good example.



Hydrometeorological disasters: droughts, floods, windstorms, wildfires and extreme temperatures

WMO vision: “To provide world leadership in expertise and international cooperation in weather, climate, hydrology and water resources and related environmental issues, and thereby to contribute to the safety and well-being of people throughout the world and to the economic benefit of all nations”.

Building human and institutional capacities

The lack of human capacity is a significant deterrent to development in the LDCs: institutions tend to be weak, lacking appropriate legal frameworks, adequate policies and strong governance structures. Compounding the problem, they often do not have the required technical capacity to effectively carry out their mandates.

WMO fosters human resources development by awarding fellowships for education and training, promoting science education and meteorology in schools, supporting the participation of experts from LDCs in study tours and in regional and international activities and by designing and implementing technical cooperation and development projects that help NMHSs in LDCs fulfil their national obligations.

Reducing vulnerability and protecting the environment

Weather-, climate- and water-related disasters account for 90 per cent of disasters worldwide, and that trend is

growing. Developed nations sustain the highest direct property losses, but the economic losses as a percentage of GDP are much higher in LDCs where they can wipe out up to 15 per cent of GDP or overwhelm a nation’s economy — this was the case in Samoa, where two cyclones struck in 1990 and 1991, setting back its development 20 years, and in Mozambique, where floods in 2000 caused annual GDP growth to plummet, from 10 to 2 per cent. Therefore, support to develop and strengthen NMHSs should be seen as an investment aimed at reducing the cost of disasters and improving the benefits derived from weather-, climate- and water-sensitive sectors. On average the cost-benefit ratio of investing in NMHSs is 1 to 10: for every dollar invested a return of 10 dollars can be expected. This figure tends to be higher in LDCs where variability in weather, climate and water is greatest.

WMO contributes to the implementation of national, regional and international initiatives aimed at establishing and strengthening mechanisms that help provide an understanding of and reduce vulnerability to



The commitments of the Programme of Action for the Least Developed Countries for the Decade 2001–2010 are as follows:

- Foster a people-centred policy framework
- Ensure good governance at the national and international levels
- Build human and institutional capacities
- Build productive capacities to make globalization work for LDCs
- Enhance the role of trade in development
- Reduce vulnerability and protect the environment
- Mobilize financial resources

disasters: the Hyogo Framework for Action: Building the Resilience of Nations and Communities to Disasters; the International Strategy for Disaster Reduction (ISDR); the International Early Warning Programme; and the Tsunami Warning System for the Indian Ocean and other basins. WMO is also actively involved in the ISDR International Reference Group that is charting the future course and organizational arrangements of the Global Platform for Disaster Risk Reduction.

WMO helps Members tackle major gaps and shortcomings in observation capacities; the provision of weather,

climate and water products and services and early warning advisories; dissemination of information; preparedness and response capabilities; and the fulfilment of capacity-building needs. Through programmes such as the Tropical Cyclone Programme, Climate Information and Prediction Services and the Agrometeorology Programme, WMO has been able to help LDCs reduce the impact of disasters and maximize the use of weather, climate and water services to derive socio-economic benefits. Good examples include:

- The weather derivatives schemes for drought in Ethiopia and Malawi;
- The tropical cyclone warning system in Bangladesh: improved forecasts of tropical cyclones with effective dissemination of warnings and wider awareness and preparedness within the vulnerable population reduced fatalities related to tropical cyclones of similar intensities to 200 in 1994, compared with 13 000 in 1991 and 300 000 in 1970;
- The malaria early warning system in southern Africa, which is based on climate indicators.

WMO has undertaken an assessment of major natural disasters, risks and mitigation capabilities for 41 LDCs, including the identification of gaps and weaknesses in the capabilities of NMHSs to provide required weather,



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climate and water products and services, the overall aim being to assist them to mainstream disaster risk reduction contributions of their services into their national development policies and strategies. WMO is pursuing efforts to develop and implement projects to address those gaps and weaknesses.

Mobilizing resources

WMO has worked with LDCs and regional organizations in the preparation of national and regional strategic action plans. In addition, WMO has supported LDCs through its regular budget, the Voluntary Cooperation Programme and trust funds, including the special Trust Fund for LDCs set up in 2003.

To support LDCs, WMO is forging alliances and innovative strategic partnerships with global, regional and subregional economic groupings, public and private sectors, banks and donors, United Nations agencies and multilateral organizations. Furthermore, WMO plays an active role in regional initiatives such as the New Partnership for Africa's Development (NEPAD) adopted by African leaders in 2001, the Pacific Island's Forum Vision Statement and other programmes that seek to eradicate poverty and create an environment favourable to sustainable growth and development, consonant with the commitments of the Brussels Programme of Action.

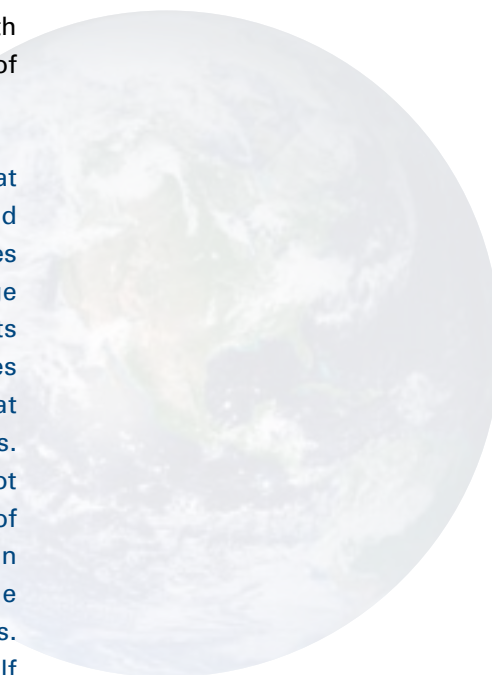
The battle is, however, far from being won. LDCs that could greatly benefit from the use of weather, climate and water services face huge infrastructure, human resources and technological capacity problems. Climate change scenarios, which point to more frequent extreme events with adverse effects on food production, water resources availability, health, pollution and the environment at large pose an additional challenge to these countries. The lack of data at the local and national levels does not allow an accurate assessment of the potential effects of climate change and hence, the adoption of adaptation and mitigation strategies. Neither is it conducive to the generation of good weather, climate and water services. NMHSs of LDCs need to be supported to bridge the gulf separating them from the rest of the meteorological community so that they can effectively contribute to national development agendas.

Much remains to be done to link advances in weather, climate and water services to policy and action. Science can improve prediction capacity—when integrated into public policy, it can help alleviate poverty and prevent the burden of underdevelopment from growing. To this effect WMO will continue to support NMHSs in LDCs

to raise awareness of the usefulness and relevance of the aforementioned services.

Examples of weather, climate and water services:

- Very short-range weather forecasts (2–12 hours)
- Short-range weather forecasts (12–72 hours)
- Medium-range weather forecasts (3–10 days)
- Extended-range weather forecasts (10 days–30 days)
- Long-range forecasts (30 days–2 years)
 - Monthly outlook
 - Seasonal outlook
- Climate predictions (beyond 2 years)
- Warnings of extreme weather, climate and water events (droughts, floods, tropical cyclones, tornadoes, severe thunderstorms)
- Specialized weather/climate products for sectoral users such as aviation, agriculture and the marine industry



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