

DRAFT

18-11-2009

WMO Strategic Plan
(05 January ~~2009~~2010)

Foreword

Executive summary

Introduction

- Societal importance of weather, climate and water services
- Purpose and context of the WMO Strategic Plan
- Future high-level strategic goals

Top-level objectives and strategic thrusts

- Improving service delivery and service quality
- Advancing scientific research and application as well as development and implementation of technology
- Strengthening capacity building
- Building and enhancing partnerships and cooperation
- Strengthening good governance

Expected results, key outcomes and performance indicators

Monitoring and evaluation

Conclusion

Appendices

Appendix I. The organization of WMO

Appendix II. The WMO strategic planning process

FOREWORD

[PLACE HOLDER – see amended version of 1 Dec 2008]

Secretary-General President
World Meteorological Organization World Meteorological Organization
Geneva, May 2011

EXECUTIVE SUMMARY

[PLACE HOLDER – see amended version of 1 Dec 2008].

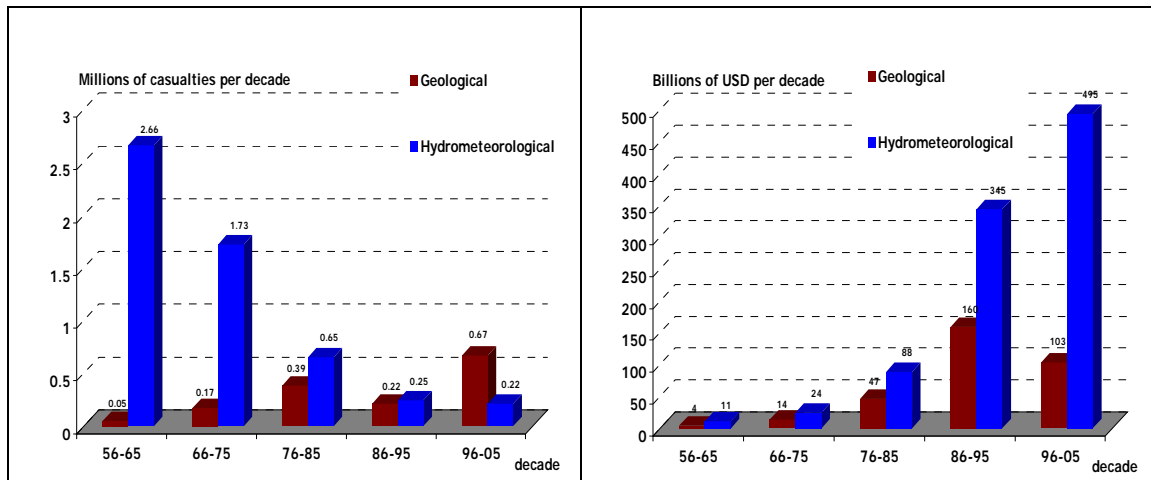
INTRODUCTION

Societal importance of weather, climate and water services

Weather and climate affect all sectors of society to varying degrees. Policymakers, professionals and the public alike use and benefit from environmental data, forecasts, information products and assessments. Notable sectors that significantly benefit from weather, climate, and hydrological information and services are agriculture, energy, transport, environment, human settlements, and water resources. Indeed, it is well recognized that global economics and financial services are influenced by weather and climate.

The social and economic impacts of weather, climate, water and environmental conditions are substantial—and they are growing. Today, up to 30 per cent of a developed country's gross domestic product is sensitive to weather, climate and water conditions, and the corresponding share is even higher for developing economies.

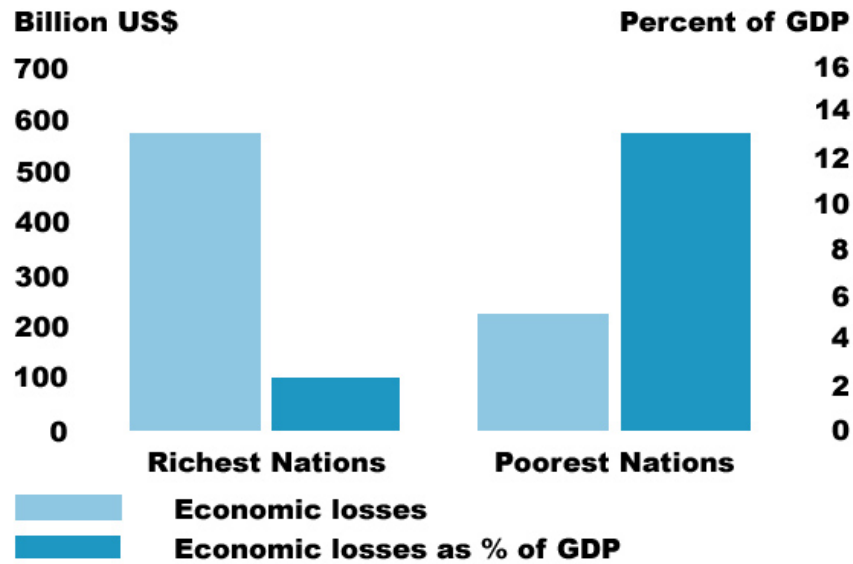
Recent statistics from the Centre for Research on the Epidemiology of Disasters ([CRED](#)) reveal that, of this total, some 90 per cent of the natural disasters, 70 per cent of casualties and 75 per cent of economic losses are caused by weather-, climate- or water-related hazards such as droughts, floods, windstorms, tropical cyclones and storm surges, extreme temperatures, land slides, wild fires or by health epidemics and insect infestations directly linked to the meteorological and hydrological conditions.



The left figure above shows the significant reduction in casualties from hydrometeorological hazards over the last 50 years which can be attributed to disaster risk reduction efforts coupling better forecasts and warnings, more timely communication of these warnings to the public and increased emergency response activities within countries. The above figure on the right however shows that property losses from hydrometeorological events have skyrocketed due to several causes including increased value of property in harms way as well as world population growth and migration of this population to areas prone to extreme weather and climate events where property and settlements are at great risk.

2005 was a record year for disaster-related losses, with the economic costs from natural disasters to the world's economies being over US\$210 Billion with losses from hurricanes in North America and the Caribbean being a major cause of the overall

economic losses (Munich Reinsurance). The trend for rising costs from disasters may be expected to continue (Ref: IPCC AR4) unless more effective disaster risk reduction strategies are implemented.



Source: Adapted from Munich Re

The above figure shows most clearly that the relative impact of economic losses from hydrometeorological extreme events is much greater on the economies of developing countries than developed countries. Thus an important role exists for improving both the hydrometeorological services (i.e., NMHSs) as well as communications and emergency response activities in developing countries to lessen the burden on their economies.

Research studies had found that the activities of the National Meteorological and Hydrological Services (NMHSs) have greatly furthered the development of their national economies, having a benefit to cost ratio between 5 and 10. A study in the United States has indicated that households on average were willing to pay over US\$10 per year for “quality” weather forecasts, leading to a benefit to cost ratio of 4.4 to 1 for this sector alone. Consistent results have been found in studies of households in other developed countries.

The estimated economic benefits of climate-time scale forecasts related to El Niño – Southern Oscillation (ENSO) events for the agriculture sector alone range from US\$450 to \$550 million/year (minimum) for world agriculture, of which \$200 - \$300 million/year is for US agriculture¹. As predictions on a seasonal time scale and beyond are further improved globally, the benefits from these forecasts will spread to more countries and into more economic sectors, with increased value for each sector.

Other studies have found that climate time-scale forecasts have been underutilized by the operational water management community but have identified specific impediments

¹ Adams, Richard M., Chi-Chung Chen, Bruce A. McCarl, and Rodney F. Weiher. “The Economic Consequences of ENSO Events for Agriculture.” *Climate Research* 13: 165-172, 1999.

to the use of climate forecasts which if addressed will lead to improved decision making in both planning and operations.

The potential problems associated with climate change compounded by the uncertainty over future global economic conditions are influencing governments to strengthen efforts to shield their populations from adverse environmental impacts. To achieve this, quality weather, climate and water related information and services are needed on a timely basis and in a form suitable for decision-makers and other users. The provision of such services is the key function of the NMHSs. To achieve this requires a much closer interaction than hitherto between information providers, especially the NMHSs, and decision-makers and other users to enable better integration of relevant information into planning processes, to enhance national societal and economic development and to mitigate economic losses and dislocation of population. Therefore a significant portion of WMO's activities will focus on achieving deliverables that will ensure the provision of relevant, high quality services by:

- Promoting communication between NMHSs and users and thereby increasing the understanding of user needs for meteorological and hydrological information and services;
- Enhancing the capacities and specialized competencies in NMHSs of developing countries to deliver timely and relevant services in order to better meet the needs of users;
- Raising the awareness of users on the availability and value of weather, climate and water services in developing countries, in particular the Least Developed Countries (LDCs);
- Having NMHSs contribute more directly to national development strategies and priorities including those related to the Millennium Development Goals (MDGs).

Despite progress in science and technology, decision makers, the general public and scientists alike continue to be alarmed by untold loss of life and property due to the effects of hydrometeorological disasters. Devastating hurricanes and associated floods, droughts and heat waves continue to ravage major parts of the world, especially in developing and least developed countries where their effects can be particularly devastating and severely set back development. Although these problems cannot be entirely eliminated, one of the lessons learnt over the years is that appropriate policies and concerted actions towards effective management of these problems can lessen their impact. In this connection, the WMO has given a high priority to fostering international cooperation and capacity building in:

- Reducing the risk of extreme weather, climate and hydrological events becoming disasters (Disaster Risk Reduction), and
- Adapting to climate variability and climate change, particularly as they impact on water resources and food security.

For several decades, WMO has worked with various stakeholders, *inter alia*, to enhance their efforts to improve environmental protection for populations, economies and national infrastructures now and into the future. Weather-, climate-, and water-related information and services provided by its National Meteorological and Hydrological Services (NMHSs), are key to any successful intervention on environmental and societal issues. The products of NMHSs have been, and will continue to be, an essential part of the necessary inputs for decision-making on environmental management and sustainable development issues. Indeed, those decisions and related actions provide an essential basis on which stakeholders are able to tackle new and emerging challenges such as enhancing economic development, poverty reduction, food production and water

availability as formulated in goals set out in Rio, the Johannesburg Implementation Plan of the World Summit on Sustainable Development (WSSD), the 2000 Millennium Development Goals and other international agreements.

The international and national communities will continue to need a strong, focused and effective approach to ensure coherent and integrated international policy and local actions on weather, climate and water. Judging by the level of progress made in the implementation of a number of internationally agreed development goals, however, there is no doubt much more should be done to enable countries to attain their development targets. To that end it is necessary to fully harness the capabilities of governments and intergovernmental groupings as well as other important players such as non-governmental organizations, civil society, and the private sector.

WMO Strategic Plan 2012-2015 Purpose and Context

THE VISION OF WMO

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.

The strategic direction of the WMO, reflected in this Strategic Plan, is driven by the needs and priorities identified by its 188 Members. The Plan outlines the Organization's strategic thrusts and the high-level expected results that address the global societal needs that are relevant to its mission and provides guidance and direction to ensure focused and coordinated approaches across the Organization. It serves as the foundation for the results based WMO Operating Plan and Secretarial Budget and for the performance monitoring and evaluation activities. Appendix II describes the WMO strategic planning process.

Because of the longer lead times required for developing improved capabilities, the WMO Strategic Plan will consider longer term social and technological issues that may impact its operations, activities and results. Thus it will have a long range outlook, while it provides detailed direction and guidance on the organization's financial period 2012–2015.

Global Societal Needs and other Strategic Considerations

The strategic direction of WMO in its planning is derived from a set of Global Societal Needs which form an over-arching framework for defining its strategic thrusts and high-level expected results. Through its Strategic Plan, the WMO can focus its planning, programmes and the activities, especially those of the NMHSs on achieving results that will provide the best possible support to the safety and welfare of its Member countries and make a contribution to meeting global needs, including enhancing the global economy and addressing global environmental issues, through the provision of information and services. WMO has strong capabilities through its Members to deliver more accurate, timely, useful and cost-effective weather, climate, water and environmental (including ocean and air quality) information, products and services to meet national and global needs. The relevant Global Societal Needs are:

- Improved protection of life and property (related to impacts of hazardous weather, climate, water and other environmental events and increased safety of transport on land, at sea and in the air),
- Poverty alleviation, sustained livelihoods and economic growth (in connection with the Millennium Development Goals) including improved health and social

well-being of citizens (related to weather, climate, water and environmental events and influence);

- Sustainable use of natural resources and improved environmental quality.

Within the international system of the UN and other international agencies, the WMO occupies a unique “niche”. WMO has the mission to provide leadership in developing expertise in all countries of the world and in enhancing international cooperation among these countries in **weather, climate, hydrology and water resources**^[AH1], and related environmental issues, thereby contributing to the safety and well-being of people throughout the world and to the economic benefit of all nations. Over its long history, WMO has been most effective in facilitating the development of National Meteorological and Hydrological Services (NMHSs) in almost all countries of the world and in developing an unmatched system of global cooperation among these countries that benefits all. It further has been a leader in addressing emerging environmental issues in cooperation with other international and national partners. These achievements include, inter alia, the following:

- **Free and Unrestricted Exchange of meteorological and related data and products**

WMO has facilitated the free and unrestricted international exchange of meteorological, hydrological and related data and products globally. This has been essential for real time weather services, for climate prediction, for climate change detection and for a broad range of global environmental programmes.

- **International Standards for Meteorological and Related Observations**

WMO has developed and maintained a set of standards for meteorological and related observations that have ensured that data are intercomparable wherever they have been collected – a vital feature for, inter alia, the detection of climate change, the development of global weather and climate models, and the services they underpin.

- **Capacity Building**

WMO has supported the building of capability in NMHSs, in all parts of the world thereby making an invaluable contribution to the safety of life and property globally.

- **Promoting Science and Technology**

The Organization has furthered the capabilities of NMHSs worldwide by promoting the use of science and technology (**recent achievements**), in both supporting infrastructure and product generation and services. It has an unchallenged reputation of excellence for facilitating the transformation of leading edge research into products and services that are immensely useful to society.

- **International Leadership**

WMO has become a recognized leader amongst the UN organizations for its capacity to promote the prediction, projection and assessment of Earth system and environmental problems. WMO has been at the forefront in drawing the world's attention to the issues of stratospheric ozone depletion and climate change. The Organization has played an important role through research and

negotiations leading to the establishment of the United Nations Framework Convention on Climate Change, the Vienna Convention on the Protection of the Ozone Layer and its Montreal Protocol, the United Nations Convention to Combat Desertification, the Nobel Prize winning Intergovernmental Panel on Climate Change, the World Climate Research Programme, and the Global Climate Observing System. It also has been a key player in the establishment of space-based monitoring of the Earth system.

To achieve these results, WMO has relied on its Members, through their NMHSs and other partnering agencies, their scientists and other professionals from universities and the private sector, and national financial support to provide the scientific, programmatic, financial and infrastructural ~~support~~ assistance necessary to develop a cost-effective international cooperative system in weather, climate, hydrology and water resources^[AH2], and related environmental issues.

In the future, however, the capabilities of other important players within the communities of non-governmental organizations, civil society, private sector and intergovernmental groupings should be more fully harnessed to address WMO's goals. For this reason the Organization will focus more broadly in promoting cooperation and capacity building. Along this line, some concrete steps that should be taken are as follows:

- Fostering international cooperation through:
 - Developing and applying scientific and technological knowledge;
 - Increasing public awareness and outreach to stakeholders;
 - Improving policy development and implementation;
 - Furthering cooperation in programme development and delivery.

- Strengthening capacity-building through:
 - Providing advisory services to Members and non-governmental institutions to assist development and implementation of policies on weather, climate and water related issues;
 - Supporting educational institutions in development and application of their scientific and technological skills;
 - Convening workshops on topics of specific interest;
 - Better informing the public and policy makers on the benefits of WMO's services;
 - Assisting in mobilizing resources with multilateral partners to increase the capacity of developing countries;
 - Providing appropriate training for meteorologists and hydrologists on how to effectively deal with wider socio-economic and political issues.

While working to improve the use of existing information and services, it is vital that the capability of NMHSs to deliver improved services be realized through:

- Strengthening the observing, data collection, processing and data management systems;
- Advancing multidisciplinary research and development on the next generation of weather, climate and earth system models, and the corresponding data assimilation systems;
- Improving delivery and distribution systems, including early warning systems, to allow NMHSs to meet the needs of institutions, agencies and the general public; consolidating existing and, when appropriate, creating new regional operational centres to mutualise competencies and resources.

Strategic Priorities Areas of WMO for Financial Period 2012 - 2015

WMO has identified 5 strategic priority areas for the period 2012 to 2015

Strategic Priority Area 1: Global Framework for Climate Services

The Heads of States and Governments, Ministers and Heads of Delegations present at the World Climate Conference-3 (WCC-3), decided to establish a Global Framework for Climate Services to help ensure that every country and every climate-sensitive sector of society is well equipped to access and apply the growing array of climate prediction and information services made possible by recent and emerging developments in international climate science and technology. The Framework has the goal to:

“Enable better management of the risks of climate variability and change at all levels, through development and incorporation of science-based climate information and prediction into planning, policy and practice.”

Production and application of climate services for the benefit of society requires concerted efforts from not only institutions specialized in climate sciences but also from all scientific disciplines supporting various development sectors. The most important feature of the Framework would be the close interaction between users and providers of climate information and products, with the value of the service to the community being judged on its ability to improve decision making. It would be based on a long-term provider-user relationship. The Framework will:

- support the individual global, regional and national entities in accessing information they need for their functioning;
- expand capability at regional and national scales through establishment of new Regional Climate Centres, facilitating the National Climate Centres and other specialized centres, where needed;
- develop standardized approach to product development and delivery (operational, timely and on agreed schedules and formats) in order to increase reliability and utility;
- enhance the professional capabilities within all operational entities to develop, work with and promote the suite of products;
- increase prediction skills and the range and quality of information by enhancing interactions between operational and research entities and improving transition of research advances into sustained, operational activities;
- facilitate access to a wider data base – from observations of new climate variables, newly digitized historical climate data, and observations from new sensors, such as radar and satellites;
- foster a service-oriented approach and maintain interaction with the users to help them get the most benefit from the products; and
- ensure that the process of development and delivery, work within a quality management framework and keeps pace over time with their evolving requirements.

Under the Framework, WMO, through its Members, would:

- continue to operate and strengthen the Observations networks;
- contribute to and effectively engage in research, modelling and prediction;
- establish the operational elements of production and service delivery systems;
- develop capacities in NMHSs, their regional networks and ~~to~~ interact with users, particularly in developing and least developed countries; and
- work with other UN, IGO and NGO partners in cross-disciplinary research and outreach to the users in support of the User Interface Program.

Strategic Priority Area 2: Disaster Risk Reduction

Disaster risk reduction is a strategic priority for WMO due to the fact that major disasters exact very high costs and dislocations in many countries, especially in developing and least developed countries and is at the core of the WMO mission and those of the NMHSs. WMO will address the information needs and requirements of the disaster risk management community, effectively and in a timely fashion, through a coordinated approach, and working with its partners.

Every year, disasters related to meteorological, hydrological and climate hazards cause significant loss of life, and set back economic and social development by years, if not decades. Despite the rising global trend in the occurrence of disasters and associated economic losses, global loss of life associated with meteorological, hydrological or climate-related hazards has decreased markedly in the last 50 years, e.g., loss of life in 2005 had decreased to one-tenth of levels in the 1950's. This remarkable decline demonstrates that preparedness and prevention, combined with effective emergency management and early warning systems, can significantly contribute to reducing impacts of hazards on human life.

The value of effective disaster risk reduction is that one dollar invested in disaster preparedness can prevent seven dollars' worth of disaster-related economic losses—a considerable return on investment.

WMO strategic goals in disaster risk reduction, derived from key activities of the Hyogo Framework for Action and approved by WMO Congress in 2007 are:

- Develop, improve and sustain multi-hazard early warning systems;
- Develop, improve and sustain systems, methods, tools and applications of modern technologies;
- Develop and deliver timely and understandable warnings, specialized forecasts and other products and services that are driven by requirements of disaster risk reduction decision processes and operations;
- Stimulate a culture of disaster preparedness through better integration of products and services of NMHSs in disaster risk reduction, and continued public education and outreach campaigns;
- Strengthen WMO and NMHSs cooperation and partnerships with national, regional and international mechanisms and structures.

These strategic goals are being realized through an action plan involving WMO Programmes, Technical Commissions, Regional Associations and partner organizations that assist Members in strengthening their capacities in disaster risk reduction. One of the goals of WMO is to reduce, by 2019, the number of deaths from weather-, climate- and water-related natural disasters by 50 per cent from the 10-year average for the period 1994-2003.

(WDS to refine draft text)

Strategic Priority Area 3: Capacity Building

All NMHSs are facing challenges in providing more diverse and reliable weather, climate and water information and services in response to the growing demand for such information, both at national and regional level, to support decision-making by governments, various economic sectors and the public. Meeting these demands and expectations can be achieved only if the NMHSs develop and sustain their capabilities. WMO plays an important role in the capacity development efforts of its Members.

Despite the great scientific and technological progress which has been made over the past three decades, many NMHSs and Regional Centres, particularly in developing and least developed countries, do not yet have the human, technical and institutional capacity to

enable them to be key players in meeting societal and development needs at national and regional level. WMO, in cooperation with its partners, can help NMHSs improve their functional and technical capabilities and strengthen their role of providers of vital information for the society. Enhancing coordination mechanisms, improvements in infrastructure, human resource development and resource mobilization, would lead to a higher profile of the NMHSs and Regional Centres and better recognition of their roles in the socio-economic agenda resulting in more adequate financial and political support.

The strategic objectives of WMO Capacity Building initiatives are:

- To improve regional cooperation and coordination between RAs, TCs and the Secretariat for setting regional priorities in order to serve Members more efficiently;
- To develop effective assistance to NMHSs to address critical issues such as forecaster qualifications for aviation meteorology;
- To give particular attention to the capacity development needs of NMHSs in developing countries, Least Developed Countries and Small Islands Developing States;
- To increase awareness of the socio-economic benefits of the products and services provided by the NMHSs and regional centres, including their contribution to the achievement of the Millennium Development Goals;
- To assist NMHSs managers with tools for social-marketing and building effective communication with governments, policy- and decision-makers, and development partners;
- To continuously assess and address NMHS training needs, including, Professional Training and Development, Technical Training, Project development and management training;
- To expand the number of strategic partnerships with internal and external stakeholders;
- To support the above initiatives through enhanced Resource Mobilization.

Strategic Priority Area 4: Weather, Climate and Water Research, Predictions and Services

The WMO Executive Council established a Task Team on Research (EC-RTT) to report on ways to “strengthen and promote the linkages between climate, weather, water and environmental research to enable NMHS and other related services to provide improved services in the next decade”. The EC-RTT recommended a major change in the paradigm for prediction research, recognizing that the traditional boundaries between weather forecasting, seasonal forecasting and climate prediction have eroded while the need for information from prediction systems has expanded to include new and novel variables and products, particularly with respect to atmospheric constituents and climate change.

The WMO Executive Council at its 61st session agreed with the vision presented by the Task Team that a more integrated view of weather, climate and water research, predictions and services would be useful to Members in improving their future service delivery. It emphasized that one of the major goals of scientific research programmes of the WMO must be an accelerated transfer of research into end-to-end operational programmes such as the World Weather Watch.

The traditional boundaries between weather and climate are conceptually artificial, but were adopted by scientists for very practicable reasons, i.e., to make the prediction problem tractable scientifically and computationally. Advances in the geophysical sciences and computing have blurred the boundary between weather to climate prediction. Also current demands for new information products from a variety of users has lead to incorporating chemical, hydrological and biological processes into weather and climate models in order to forecast a much broader range of environmental parameters, including inter alia, air quality, flooding, sand and dust storms, and changes in vegetation. Finally many of the applications and impacts of weather and climate share a common underlying scientific basis.

Placing priority on an integrated Weather, Climate and Water Research, Predictions and Services programme would:

- Lead to a unified approach to multidisciplinary weather, climate, water, ocean and environmental prediction research and the associated services. The unified approach to prediction and services should span multiple spatial scales as well as multiple time scales, including for example downscaling of climate information to local scale.
- Propose high-performance computing investments to accommodate the increasing complexity and detail of models;
- Accelerate the development, validation and use of prediction models through :
 - Bridging the gaps between weather, sub-seasonal and seasonal predictions;
 - Approaching decadal and multi decadal predictions as an initial value problem as well as a boundary forced problem;
 - Incorporating aerosols and ozone in operational analysis and prediction systems;
- Develop closer linkages between research, operations and users through such mechanisms as Forecast Demonstration Projects

This strategic priority will be implemented through Key Outcome 5.4 that through the activities of the NMHSs and national research partners, will extend the WWRP-THORPEX Global Integrated Forecast System approach to improve short-term forecasts of climate, water and the environment from months to seasons.

(OBS, CWD, RES, WCRP, WDS to develop draft text)

Strategic Priority Area 5: WMO Integrated Global Observing System (WIGOS)

One of the major purposes of the World Meteorological Organization (WMO), as laid down in its Convention, is "To facilitate worldwide cooperation in the establishment of networks of stations for the making of meteorological observations as well as hydrological and other geophysical observations related to meteorology, and to promote the establishment and maintenance of centres charged with the provision of meteorological and related services. Accordingly, WMO Members operate, in a coordinated manner, complex networks in space, the atmosphere, on land and over oceans.

In 2007, Members decided to work towards enhanced integration of both the WMO Global Observing System (GOS) and WMO co-sponsored observing systems such as the Global Ocean Observing System (GOOS), Global Terrestrial Observing System (GTOS) and Global Climate Observing System (GCOS). This concept is called the WMO Integrated Global Observing Systems (WIGOS).

WIGOS will consist of more than 10000 manned and automatic surface weather stations, 1000 upper-air stations, over 7000 ships, more than 100 moored and 1000 drifting buoys, hundreds of weather radars and over 3000 specially equipped commercial aircraft measure key parameters of the atmosphere, land and ocean surface every day. The space-based component contains operational polar-orbiting and geostationary satellites and also R&D environmental satellites complementing ground-based global observations. These activities are coordinated within WMO by the Global Observing System (GOS) of the World Weather Watch (WWW). Other global observing systems included are the Global Atmosphere Watch as well as the global hydrological networks, which function principally on a national or regional level, however. The Global Atmosphere Watch of WMO provides data for scientific assessments and for early warnings of changes in the chemical composition and related physical characteristics of the atmosphere that may adversely affect the environment.

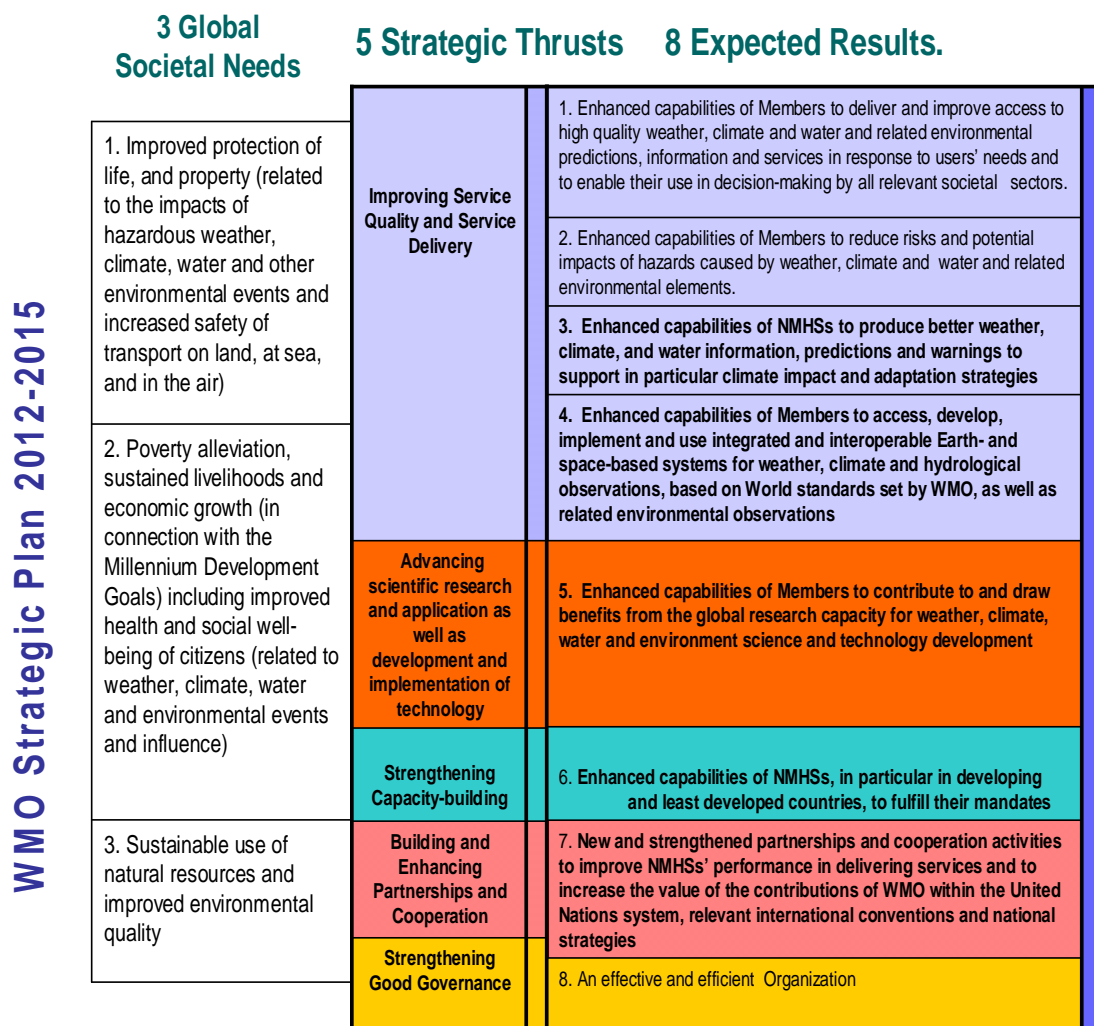
Observation programmes, such as GCOS and GOOS, will continue to play a major role in improving the collection of required data for the development of climate forecasts and climate change detection. WMO also ensures that meteorological instruments, including manual and automatic ground-based stations and space-based observing systems, are accurate and provide standardized data.

WMO monitoring and observing systems will be a core component of the Global Earth Observation System of Systems (GEOSS), aimed at developing a comprehensive, coordinated and sustained Earth observation system of systems to understand and address global environmental and economic challenges.

(OBS to insert draft text.....)

Proposed Structure of the WMO Strategic Plan 2012-2015

The revised WMO Strategic Plan consists of 5 Strategic Thrusts and 8 Expected Results that address the three Global Societal Needs (see schematic diagram below). Following from each Expected Result will be a limited number of specific programmatic and management “Key Outcomes” that the Organization as a whole will achieve over the next 10 years to deliver more accurate, timely, useful and cost-effective weather, climate, water and environmental (including ocean and air quality) information and services to meet national and global needs.. The related WMO Operating Plan will then address the short term actions (i.e., deliverables and activities) within the WMO Financial Period 2012-2015 that the organization will take in achieving these “Key Outcomes”.



STRATEGIC THRUSTS

STRATEGIC THRUSTS OF WMO

- Improving service quality and service delivery;
- Advancing scientific research and application as well as development and implementation of technology;
- Strengthening capacity building;
- Building and enhancing partnerships and cooperation;
- Strengthening good governance

STRATEGIC CONSIDERATIONS

Addressing current and future urgent social and economic conditions and events will require targeted improvements in weather, climate, water and related environmental information and services. The impacts of climate variability and extreme environmental events create social and economic stresses that require new meteorological, hydrological and climate services in order to ensure the safety and security of populations and to develop adaptive economic response strategies. Responding to these stresses is especially critical given population growth in environmentally vulnerable regions, such as continental coastlines and lowlands, and, in recent years, an apparent increase in the intensities and frequencies of extreme events. In responding to these drivers, the Organization has included several fundamental strategy development considerations:

- WMO Members must provide timely, accurate and cost-effective products and services that are useful to governmental and business-sector decision makers;
- WMO Members must understand and be responsive to users' changing needs by enhancing the relevance and increasing the utility of weather, climate, water and related environmental information and services for users;
- WMO must help the international community to deal with the climate change adaptation challenge by providing the best science and science based climate information and products and ensuring their appropriate use;
- WMO must promote partnerships at national and international levels due to the increasing cost and complexity of the science and technology used to provide information and services;
- WMO must participate more fully in international programmes and conventions to provide visibility to its Members and activities;
- WMO must assist countries in translating commitments, particularly those agreed within the framework of global conferences, summits and international conventions, into effective and practical measures.

.Improving Service Quality and Service Delivery

Weather, climate, water and related environmental information must reach the user—dependent on this information to make decisions—in an understandable and usable form and in a timely fashion to have the desired effect. Yet despite the scientific and technological improvements of the past few decades, service delivery is still a serious limiting factor for many Members. Information producers and providers must better understand the needs of users and how information is applied in decision-making. New techniques will need to be developed to provide it. In addition, users must better understand the information content to benefit fully. For many Members' National Meteorological and Hydrological Services, there is a need to shift the focus from creating information to providing improved services. Finally, the technologies for transmitting the information from providers to users need upgrading to increase the speed and volume of information provided and to reduce costs.

Those who produce the information must better understand the users' needs and how information is applied in decision-making, and new techniques will need to be developed to provide it

The service delivery strategic thrust aims to achieve the following objectives:

- Improve the speed, volume and cost-effectiveness of telecommunications for weather, climate, water and related environmental information so as to ensure that it arrives at the right place, at the right time and in a cost-effective manner. The expectation is that targeted, improved information will be delivered to people, their governments and economic sectors in ample time for use in everyday decision-making;
- Enhance the understanding of and ability to address user needs. The expectation is that Members' National Meteorological and Hydrological Services will be ~~more~~ keenly aware and capable of responding to the users needs of their information and services and that the uptake of services by the public, governments and economic sectors will grow;
- Increase the provision of climate-related hydrological and agricultural information that is essential to sustain water and food security. The expectation is that new forecasting and assessment techniques will be developed and implemented to provide enhanced services to the water resource management and agricultural sectors and international aid agencies;
- Increase the provision of weather, climate, water and related environmental information to sustainable development practitioners. The expectation is that hydrometeorological risk assessment, climate variability and climate change information will be mainstreamed into development planning;
- Expand the provision of weather information needed to improve aviation safety and air traffic management. The expectation is that weather-related aviation mishaps will continue to decrease and that weather-related air traffic delays will be reduced;
- Improve the operational oceanographic and marine meteorological services that many Members provide by delivering more specific and targeted marine products to users. The expectation is that weather-related marine accidents and transportation

Expected Results

1. Enhanced capabilities of Members to deliver and improve access to high-quality weather, climate and water and related environmental predictions, information and services in response to users' needs and to enable their use in decision-making by all relevant societal sectors;
2. Enhanced capabilities of Members to reduce risks and potential impacts of hazards caused by weather, climate and water and related environmental elements;

delays will be reduced and that the sustainable use of the marine environment will increase.

- Enhance capabilities and capacities with respect to disaster risk reduction in the weather, climate and water domains, and strengthen appropriate mechanisms at the national and international levels; in partnership with other international organizations, bolster the effectiveness of multi-hazard early warning by augmenting capabilities and capacities to deliver warnings related to a broader range of environmental hazards, including tsunamis, accidental nuclear releases, volcanic eruptions and other environmental events. Key international partners include the United Nations Educational, Scientific and Cultural Organization/Intergovernmental Oceanographic Commission, the International Atomic Energy Agency and the International Civil Aviation Organization.

Advancing scientific research and application as well as development and implementation of technology

Weather, climate, water and related environmental information and services have made great progress owing to significant scientific and technological improvements over the past three decades, including better warning lead times, more accurate predictions and new products and services, such as air quality alerts, seasonal climate outlooks and other environmental products. However, significant shortfalls in critical scientific and technology areas remain. As populations grow and development continues, often in environmentally sensitive regions, the impacts of using inaccurate or untimely environmental information will grow at an accelerating rate. Continued improvements are needed in key scientific areas to increase the scope, accuracy and lead time of weather, climate, water and related environmental information and services. Furthermore, the availability of comprehensive and robust information networks is fundamental for the production of quality services. The implementation of advanced technologies is necessary to achieve the required performances.

The science and technology development and implementation strategic thrust is designed to accomplish the following tasks:

- Implement, enhance and maintain integrated weather, climate, water and related environmental observing networks with appropriate resolution, accuracy, reliability, and timeliness to meet user needs. The expectation is that forecasts, warnings will be more accurate and hazard risks will ~~reductions will be more accurate~~ by having better data and stronger R&D results.
- Implement, enhance and maintain information systems enabling timely data exchange, analysis and management in order to maximize the availability and accessibility of weather, climate, water and related environmental information
- Develop and implement enhanced capabilities for very short-range (one to six hours) forecasts and warnings to significantly improve the accuracy and lead time of severe weather warnings and advisories to the public, emergency managers and other decision makers. The expectation is that making nowcasting tools available will significantly enhance warning accuracy and lead time for all meteorological and hydrological services;
- Improve storm track and intensity forecasts to reduce the errors that in turn increase the overall cost of disaster mitigation activities, and, in worst case scenarios result in communities not being warned of hazardous weather events. The expectation is that the uncertainty of forecasts beyond the three- to five-day limit will be reduced or better quantified, or both;
- Provide quantitative measures of information certainty and/or uncertainty to increase the utility of weather, hydrology and seasonal climate information in decision-making, with a specific focus on ensemble prediction systems. The expectation is that operational products, which quantify forecast confidence, will be available to the users;
- Improve the utility of weather, seasonal climate and hydrology

Expected Results

3. Enhanced capabilities of NMHSs to produce better weather, climate, and water and related environmental information, predictions and warnings to support in particular climate impact and adaptation strategies;
4. Enhanced capabilities of Members to access, develop, implement and use integrated and interoperable surface-based and space-based systems for weather, climate and hydrological observations as well as related environmental observations, based on world standards set by WMO.
5. Enhanced capabilities of Members to contribute to and draw benefits from the global research capacity for weather, climate, water, and environmental science and technology development.

forecasts to allow advance planning in social and economic sectors, such as development, disaster risk management, transportation, agriculture, health and energy, which could generate significant socio-economic benefits. The expectation is that environmental information, produced and provided in time, will be effectively integrated into decision processes;

- Develop and implement better operational air quality and air chemistry capabilities needed to support governmental and other national initiatives aimed at enhancing the quality of life and protecting the environment. The expectation is that the capability of Meteorological Services to provide air quality and chemical weather forecasts and to extend these forecasts to relevant atmospheric constituents will increase;
- Expand the use of scientific models and techniques in producing environmental information and services. In particular, it is planned to develop further and implement the capability to forecast many components of the environment simultaneously. The expectation is that a broader diversity of environmental predictions based on the latest scientific advances will become available;
- Improve the operational use of climate science to support societies' needs to adapt to climate change and variability. The expectation is that the development of reliable and authoritative climate services will provide a sounder basis for the development and implementation of regional, national and local adaptation plans on multi-annual to decadal timescales.

Improved science and technology have produced better warning lead times, more accurate predictions and new products and services, such as air quality alerts, seasonal climate outlooks and other environmental products

Strengthening Capacity-Building

Many developing and least developed countries lack the institutional infrastructure to provide even the most basic services to their governments and society. Institutional capacity-building is therefore a priority for these countries to develop the necessary national capabilities and expertise for addressing environmental and development issues. Management education and training, as well as scientific and technical skills development, are essential.

Despite continued improvements in science and technology, the NMHSs of these developing and least developed countries often cannot avail of these advances and their operations are insufficient to deliver adequate weather, climate, water and related environmental information and services to meet needs of users in these countries.

The media is a primary tool for communicating relevant environmental information to the public. Service providers in many developing and least developed countries do not have the ability to exploit the media effectively. Building capacity in communications, especially through television and radio broadcasting, to deliver information effectively to society is needed, both at the national and international levels.

In developed and developing countries alike, the public and decision makers are often not aware of the information, products and services from NMHSs beyond the daily weather forecast. WMO and NMHSs have not been effective in communicating the benefits of such services and products, while in turn, people and governments have been slow to recognize their utility. There is a need for education of both those who deliver and those who use weather, climate, water, oceanic and air quality information, especially in developing and least developed countries. Full benefits will only be achieved through continued capacity-building for all users and providers.

The Millennium Development Goals recognize that men and women play different parts in society and that all United Nations organizations should strive to achieve gender equality. In many developing countries, there is a need to provide services tailored to the needs of women, who act as family protectors in times of disaster, play a significant role in agriculture and water resources, and receive and use environmental information.

The capacity-building strategic thrust is important for:

- Fostering as appropriate, regional, subregional and national approaches to upgrading capacity of NMSHs in basic systems, data acquisition and dissemination technologies, communications, client relations and service delivery
- Increasing the capacity of NMHSs in developing and least developed countries to align their services with the specific development needs in their countries;
- ;
- Strengthening the scientific and technical capacity of developing and least developed countries to develop and apply weather-, climate- and water-related information and products in support of socio-economic

Expected Result

6. Enhanced capabilities of NMHSs, in particular in developing and least developed countries, to fulfil their mandates

development

- In the case of developing nations, enhancing their capacity to optimize their own investments and in-country donor funded activities that boost their capacity to provide user-relevant services;
- Assisting in the broadening of governmental and public education in Member countries to create a more environmentally literate populace;
- Implementing initiatives to build the capacity of societies to address the different needs and experiences of men and women in the development of environmental products and services.

Building and enhancing partnerships and cooperation

The complexity of the Earth system and the interconnections between weather, water, climate and related environmental processes are increasingly challenging the scientific and financial capacity of WMO to improve the quality and accuracy of information and products. No single government or agency has the necessary resources to address all the challenges on its own. Consequently, the Organization's success depends on its ability to partner effectively with internal stakeholders and external organizations to meet its objectives.

The partnership strategic thrust is important to:

- Heighten understanding and use of WMO's environmental information and service capabilities by the United Nations system, Member countries, international and national organizations. The expectation is that all partners and constituents will have a better understanding of WMO capabilities and can leverage them for the public good;
- Enhance WMO's ability to utilize appropriately the capabilities and information of other organizations in developing and improving WMO information and services. The expectation is that the scope of services and the responsiveness of Member's agencies to emerging requirements will increase by leveraging capabilities of partners to develop and sustain service improvements;
- Broaden partnerships between developed, developing and least developed countries involving relevant national agencies. The expectation is that the capabilities of countries to acquire and exploit information for the public good will be enhanced and that all countries will benefit from closer cooperation;
- Maintain a proactive role in ensuring a coherent, science-based approach within the United Nations system and among other stakeholders to implement environmental conventions, including outcomes of World Summits and follow-up to the United Nations Framework Convention on Climate Change, the Vienna Convention for the Protection of the Ozone Layer, the United Nations Convention to Combat Desertification, the United Nations Economic Commission for Europe Convention on Long-range Transboundary Air Pollution and the United Nations Convention on Biological Diversity. The expectation is that WMO activities will be mainstreamed into the agenda for action by the international community.

Expected Result

7. New and strengthened partnerships and cooperation activities to improve NMHSs' performance in delivering services and to increase the value of the contributions of WMO within the United Nations system, relevant international conventions and national strategies

Strengthening good governance

An organization's resource limitations and sub-optimum alignment with its objectives are fundamental constraints on the pace—and ultimately—the success of every strategic plan. Internally, process and management efficiencies can help mitigate resource limitations and can expedite progress towards strategic targets by improving alignment with organizational priorities. Good governance promotes open and transparent processes, efficient and effective use of resources and equitable treatment of all parties. Explicit efficiency goals are needed to accelerate the pace of improvements within currently achievable resources.

This strategic thrust aims to improve management by:

- Promoting open and transparent business processes, efficient and effective use of resources and equitable treatment of all parties;
- Enhancing the efficiency of the WMO Secretariat. The expectation is that budget growth for routine support will be kept below average and growth in extra budgetary resources may increase;
- Ensuring the integrity of WMO management systems, including information technology. The expectation is that WMO will maintain a robust physical and electronic archive of information and metadata, as well as a strong financial system and risk management system;
- Improving the connection of the Organization's Programmes and Budget to its strategic initiatives, and strengthen the results-based management systems and practices. The expectation is that the planning process will be aligned to foster the efficiency and delivery of WMO Key Outcomes and their supporting programmes;
- Affirming the Organization's effectiveness by conducting a comprehensive review of its structure, programmes and priorities and implementing the findings thereof. The expectation is that WMO will align itself with its continuing objectives.

Expected Result

8. **An effective and efficient Organization**

Within the framework of the three top-level objectives and five strategic thrusts described in this section, WMO will give special attention to needed improvements in disaster prevention and mitigation, capacity-building and other important ongoing activities related to data and product quality, service delivery and organizational efficiency. These priority needs are described in the next section as expected results.

EXPECTED RESULTS, KEY OUTCOMES AND PERFORMANCE INDICATORS

The Plan motivates and guides the collective and coordinated activities of the regional associations, technical commissions and Members, who engage primarily their National Meteorological and Hydrological Services (NMHSs). The WMO Strategic Plans defines five strategic thrusts that support WMO's mission and role in meeting the Global Societal Needs that can benefit from the know ledges, products and services that reside in the WMO Members and their NMHSs. Leading from the five strategic thrusts are a set of overall expected results, key outcomes, and associated key performance indicators. The key performance indicators provide a measure of success in the achievement of the key outcome.

For each expected result and key outcome, a set of programme activities and the associated deliverables and performance targets that contribute to the achievement of the expected results will be specified through guidance from the Technical Commissions, Regional Associations, and Members with input from the Secretariat. These programme activities and deliverables provide a foundation for the development and implementation of the WMO Operating Plan that forms the basis for the development of the Secretariat Results Based Budget. The WMO Operating Plan and Secretariat Results Based Budget provide the connection of the programme activities to the detailed deliverables, performance targets and the allocation of resources.

Most expected results will contribute to implementing the Global Framework for Climate Services, a long-term cooperative arrangement through which the international community and relevant stakeholders will obtain better information to enable better management of the risks of climate variability and change at all levels. WMO, having developed many of the essential elements within the Framework through its NMHSs, is committed to play a pivotal role in its implementation.

Expected results, key outcomes and performance indicators by Strategic Thrusts (ST)

ST 1: Improving service quality and service delivery

ER 1: Enhanced capabilities of Members to deliver and improve access to high-quality weather, climate, water and related environmental predictions, information and services in response to users' needs and to enable their use in decision-making by all relevant societal sectors

KO 1.1: WMO will establish the requirements of the **public and national economic sectors** for weather-, climate-, water-, and environmental-related warnings, forecasts and supporting information, for key socioeconomic sectors including:

- The public
- Emergency Management
- Health
- Agriculture, Forestry and Fisheries
- Water Resource Management;

- Marine;
- Aviation;
- Tourism;
- Urban Planning;
- Energy;
- Finance.

The paradigm for the provision of meteorological (weather and climate) and hydrological services is changing rapidly. In the past weather services predominated, and because of time constraints for decision making in the weather sensitive sectors, services were supply driven, largely limited by the products that could be sent to clients in the time available before decisions were to be taken. Increasingly the requirements for meteorological and hydrological services have broadened and many are not as time-bound as was the case in the past. Furthermore the variety of information available has expanded substantially and will continue to expand. Increasingly the emphasis is on providing a service that requires the service provider to understand the use to which the meteorological and hydrological services will be put so as to best structure the information flow. It is clear that requirements differ from sector-to-sector, but what is common across sectors is the need for integration of weather, climate and water services within a single service. Achievement of this Key Outcome also will represent an important contribution to the Global Framework for Climate Services (GFCS), particularly the Climate User Interface Programme, which will develop ways to bridge the gap between the climate information being developed by climate scientists and service providers and the practical information needs of users, particularly the Climate User Interface Programme, which will develop ways to bridge the gap between the climate information being developed by climate scientists and service providers and the practical information needs of users.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Increased use and value of meteorological and hydrological information, including on the polar regions, by the public and sectoral users;
- Studies and analyses showing social and economic benefits of the improved services, user interface mechanisms to deliver sector-targeted weather-, climate- and water-related information products within the NMHSs;
- Use of guidance materials by NMHSs for improving sector specific services, e.g., using hydro-meteorological data or managing risks associated with extreme events.

KO 1.2: WMO will promote enhanced access to products (information and data) that underpin the services of the NMHSs aimed at meeting the requirements of the **public and national economic sectors** through provision of seamless weather, climate, water and related environmental services to meet the needs of decision makers.

The provision of weather, climate water and related environmental services must be client driven, and an important part of the NMHSs' response to client needs will be improving the range of, and access to products that meet users needs. The challenge for the meteorological and hydrological communities is to ensure that the new products, and new service delivery capabilities meet the needs established through working with users. Noting that needs change over time, and new clients of meteorological and hydrological services emerge, an effective rolling review of client needs will need to be established and the results used to plan the production and distribution of new products. Achievement of this Key Outcome will represent an important contribution to the Global Framework for Climate Services (GFCS).

Overarching Key Performance Indicators (KPIs) include, inter alia:

- Users with regular access to information and products provided by NMHSs;
- NMHSs with regular access to products provided by global and regional centres

including the Global Producing Centres of Long Range Forecasts, Regional Climate Centres and other RSMCs.

- Number and range of products available for user sectors, including those in Polar Regions.

ER 2: Enhanced capabilities of Members to reduce risks and potential impacts of hazards caused by weather, climate and water and related environmental elements

KO 2.1: WMO, in cooperation with national and regional hazard response agencies, will promote and implement **multi-hazard early warning systems** in all NMHSs and improve the range, quality, and timeliness of the services.

Separate warning systems cannot be developed for each hazard a community faces, rather multi-hazard systems using consistent warning strategies and information conduits are required if communities are to be best placed to become aware of, and respond appropriately to the potential disasters. The challenge for the NMHSs is to develop a seamless approach to the provision of information to emergency management decision makers regardless of whether the potential disaster is weather-related (e.g., blizzard, tornado, forest fire), climate-related (e.g., significant increase in heat waves, coastal inundation from sea level rise, expansion of climate-related malaria affected areas) or water-related (e.g., flood, drought). Furthermore the information required should meet the needs for planning, public education, and be available for appropriate risk reduction measures immediately prior to, and during the onset of any potentially hazardous event. The requirement for this information can only be properly obtained when a nation's NMHS is an integral component of the larger, national emergency management system. [Regional cooperation and data sharing is also essential for improvement of quality and timeliness of weather, climate and hydrology services for national purposes. It also allows NMHSs to maximize the utility of modern technology and to minimize national expenditures.](#)

Typical [Key Performance Indicators \(KPIs\)](#) include, inter alia:

- NMHSs with strengthened multi-hazard early warning systems;
- Weather, climate and water related hazards covered by early warning systems;
- Collaborations with national emergency management systems in the development and delivery of services.
- [Strengthened regional collaboration and sharing the information among NMHSs](#)

KO 2.2: WMO, in cooperation with national hazard response agencies and foreign aid donor agencies, will work on a national or regional basis to increase the capacity of developing country NMHSs to provide disaster risk reduction services and to become integrated into national emergency management systems.

Increasingly donor agencies and countries are drawing a strong link between disaster risk reduction and climate change since it is recognized that climate change can lead to the increased frequency and possibly intensity of certain types of extreme events, such as coastal inundation, heat waves and forest fires as well as drought, tropical cyclone and severe winter storms. As a cost-effective adaptation measure developing countries aid agencies are showing a willingness to work with the WMO in developing and implementing disaster risk reduction strategies on a regional and national basis.

Typical [Key Performance Indicators \(KPIs\)](#) include, inter alia:

- Developing country Members working with aid agencies to improve disaster risk reduction Services;

- Developing countries with catalogues and maps of potential hazards
- Partnerships among countries on the provision of disaster risk reduction services.

KO 2.3: WMO, in cooperation with national flood management agencies, will assist Members in adopting an **integrated approach to flood^[AH3] management** to make best use of their flood plains and minimize the losses due to flood hazards nationally and regionally.

National flood management policies should be closely related to the overall national development policy as a tool for sustainable development. They also should be based on the integrated approach to flood management within the overall integrated water resource management principles and supported by the risk management principles. The NMHSs should be able to provide the required inputs for such an integrated approach. Since in majority of the countries the NHSs and NMSs are housed under separate ministries, it is important that greater cooperation between these two institutions within the countries is improved. This is of particular relevance in the provision of Flash Flood Guidance. Assessment of flood risk also requires critical inputs from meteorological and hydrological services. Improved hydrological forecasting capabilities (lead-time and accuracy) and comprehensive flood risk assessments will benefit from increased cooperation between meteorology and hydrological agencies within countries and between countries on transboundary floods and the impacts of climate variability and change (variability, frequency and severity of flooding) on flood management.

-Integrated approaches to meteorological, hydrological and agricultural droughts will also be developed under the program.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Formal cooperation agreements in flood forecasting at national and regional level;
- Manuals and Guidelines published under the QMF-Hydrology
- Regional hydrological information systems established in transboundary basins

ST 2: Advancing scientific research and application as well as development and implementation of technology

ER 3: Enhanced capabilities of Members to produce better weather, climate, water and related environmental information, prediction and warnings to support in particular climate impact and adaptation strategies.

KO 3.1: WMO will promote the production of improved **long range predictions** (e.g., monthly and seasonal predictions) and the rapid dissemination of timely warnings.

Brief paragraph – describing the importance and impact of the KO, any strategic, programmatic, or financial considerations, and measures of accomplishment.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Accuracy and timeliness of long range weather predictions and adequacy of lead times of warnings
- Members providing long range forecast products (e.g., monthly predictions).

KO 3.2: WMO will promote the development and implementation of operational systems by Members to generate and disseminate better targeted climate information and prediction products to meet user needs for **climate adaptation and risk management and in support of the Global Framework for Climate Services (GFCS)**.

WMO will have to facilitate the work of the NMHSs in making their products and information more useful to the society and actionable in day to day decision making. Greater emphasis will be necessary on user oriented tailored products and applications in agriculture, water sector, and disaster risk reduction.

The WMO will develop the Climate Services Information System (CSIS) under the GFCS to improve the operational systems of Members to develop better climate information and prediction products and to enhance the capacity at the national level to produce and disseminate such products targeted to user needs in support of climate adaptation and risk management. The emphasis will be on facilitating a regular and effective flow of climate information from global to national scales, through the existing GPC-RCC-RCOF-NMHS framework, by strengthening and expanding the operations of these entities worldwide. CSIS will build on the outcomes and established mechanisms under the World Climate Programme (e.g., CLIPS) and will strengthen and better coordinate the existing institutions, infrastructure and mechanisms by focusing on user-driven activities and outputs, while continuing to implement science-and technology-driven production systems. CSIS will benefit from the experiences gained over last 10 years and enhance effective use of global, regional and national climate information and prediction services by all stakeholders in climate-sensitive sectors in all countries (leading to improved planning and investment in sectors vital to national economies and livelihoods). This is expected to result in widespread social, economic and environmental benefits through more effective climate risk management and increased capacities for adaptation to climate variability and change.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Members widely accessing GPC, RCC and RCOF products and using the guidance materials on downscaling and on interpreting and transmitting climate products for national needs;
- Members having National Climate Centres/Services including National Climate Outlook Forums;
- Members using guidance products on best practices for climate adaptation and risk management in key socio-economic sectors

KO 3.3: WMO will enhance the capacities of Members to produce and deliver **water related information and products**, including water resource assessments that suit the needs of their users, through up-to-date guidance material and increased access to technology and advisory services.

The Quality Management Framework – Hydrology, established by Commission of Hydrology, provides overall strategy, advice, guidance and tools for attaining efficiency, quality and effectiveness in the functioning of hydrological services. One of the main components of the QMF – Hydrology is the preparation of guidance material, such as the Guide to Hydrological Practices. Emphasis will be on ensuring that these materials are made available in all official WMO languages and become the basis for implementation of related capacity building activities. WMO will continue to emphasize the need to increase the capacities of the NMHSs of developing and least developed countries to improve hydrological forecasting, water resources assessment and management, and adaptation to climate variability and change in the various transboundary basins. WMO also will seek to mobilize resources for the improvement of hydrological networks for these countries. WMO, through its connection with the water sector in the countries and close collaboration with UN-Water agencies, will play an important role in implementing the User Interface Programme of the GFCS by enabling national hydrological services to serve as the links between climate and water communities within their countries.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Utility of current guidance materials for hydrology and water resource management;
- Operation of observing networks and development of regional hydrological data bases in transboundary river basins.

KO 3.4 WMO will enhance the capacities of NMHSs to maintain and continuously update modern archives for climate data and generate improved climate monitoring and climate watch products in compliance with WMO guidelines and the evolving requirements and needs of the Global Framework for Climate Services

Typical Key Performance Indicators (KPIs) include, inter alia:

- Global and regional initiatives for climate data rescue and climate data and metadata aiming at improving the use and exchange of high quality climate data sets;
- Members developing and exploiting modern climate system monitoring including Climate Watch Systems (CWS);
- Assessment of the state of the Global Climate System at various time-scales.

ER 4: Enhanced capabilities of Members to access, develop, implement and use integrated and interoperable surface-based and space-based systems for weather, climate and hydrological observations, as well as related environmental observations, based on world standards set by WMO.

KO 4.1: WMO will continue to develop and implement the **WMO Integrated Global Observing System** to improve the development and integration of surface- and space-based observations to meet the needs of Members to provide services to their users.

The WMO Integrated Global Observing System (WIGOS) will establish an integrated, comprehensive and coordinated observing system to satisfy in a cost-effective and sustained manner the evolving observing requirements of WMO Members and will enhance coordination of WMO observing systems with those of partner organizations for the benefit of society. An example of a new data set would be the establishment of Global Cryosphere Watch (GCW).

Typical Key Performance Indicators (KPIs) include, inter alia:

- Availability of WIGOS standards and procedures and completion of WIGOS milestones;
- Availability of observations to WMO Members and external users;
- Documented quality of observations, especially for hydrologic and climate purposes

KO 4.2: WMO will continue to develop and implement the new **WMO Information System** to meet the needs of the NMHSs and national users generally.

The WMO Information System (WIS) will provide, in an affordable and effective way, the interoperability and information exchange components and management of all WMO activities. In particular WIS will support the collection and sharing of observations and products within WIGOS, disaster risk reduction and for the evolving requirements and needs of the Global Framework for Climate Services (GFCS).

Typical Key Performance Indicators (KPIs) include, inter alia:

- Implementation of WIS by NMHSs;
- NMHSs with continuous access to observations and products through the use of WIS

KO 4.3: WMO will facilitate the improvement in **high quality climate observations** to meet the needs of international, regional and national users of climate data and their derived products, especially in response to the requirements of the UNFCCC.

The co-sponsored Global Climate Observing System (GCOS) has responsibility for coordinating the improvement and setting the requirements of climate observations and related data products working with WMO components (NMHSs, TCs, RAs) and its observing system partners (e.g., GOOS, GTOS, CEOS, GEO). GCOS, while emphasizing global scale climate observations, also seeks to improve regional and national observations for all observing system domains – atmosphere, ocean, and land – for both in-situ and space-based observations, involving a multi-disciplinary range of physical, chemical and biological properties and atmospheric, oceanic, hydrologic, cryospheric and terrestrial variables. These observations are critically important in supporting the Global Framework for Climate Services (GFCS), the Intergovernmental Panel on Climate Change (IPCC), and the WMO Member States in their national climate services and in activities under the UNFCCC.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Number of NMHSs and GCOS partner organizations with ability to develop and implement integrated (or assimilated) products from *in situ* and satellite observations and data.
- Number of reports on progress in the implementation of the global observing system for climate in support of the IPCC and UNFCCC;
- Number of and timely completion of specific GCOS activities in support of the Global Framework for Climate Services, including availability of climate observations within the GCOS network for national climate services.

ER 5: Enhanced capabilities of Members to contribute to and draw benefits from the global research capacity for weather, climate, water and environment science and technology development

KO 5.1: WMO will identify and support new directions for climate research to meet the needs of the NMHSs, climate related Convention, and other users of climate information and seek scientific consensus on how to advance understanding, research and modelling to improve **climate prediction/projection skill for seasonal, decadal, and longer time scales**.

The scientific community, policy makers and many sectoral users look to the co-sponsored World Climate Research Programme (WCRP) to provide the most up-to-date climate information products and tools. The Intergovernmental Panel on Climate Change relies on WCRP to organize and coordinate much of the research it assesses, as is the case for the Ozone Convention. The improvements to climate models and prediction systems and greatly improved downscaling tools for regional applications will provide key input for climate change adaptation and planning and to the Global Framework for Climate Services. Advances in seasonal and longer predictions skill will have direct benefits for NMHSs and their clients. WCRP activities will also enhance the value of climate information available to meet the needs of scientists and decision-makers by supporting key observational, processing/reprocessing and analysis/reanalysis efforts. WMO will host the WCRP secretariat and provide funds for staff salaries as well as

contribute support for the Programme's activities. Additional support will come from the other two sponsors of WCRP, IOC of UNESCO and ICSU and through direct contributions from relevant national agencies and institutions.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Measures of skill of climate predictions and projections for enabling climate services;
- Completion of syntheses and publication of latest climate research results and findings for use by the scientists, policy- and decision-makers in climate adaptation, mitigation and risk management,
- Interactions between operational and research communities to introduce research advances into NMHS operations, e.g., updating operational systems based on new research advances, such as improving prediction models within the operational systems supporting the Global Framework for Climate Services.

KO 5-2: WMO will promote research to **advance knowledge and improve the prediction of high-impact weather on time scales of hours to seasons** and will promote and facilitate the transfer of research advances into the operational practice at NMHSs.

WMO Weather Research Program (WWRP) spans nowcasting, mesoscale meteorology, global numerical weather prediction, tropical meteorology, forecast verification, weather modification assessment, and societal and economic research and applications. The unifying theme is predicting weather events that are economically disruptive, are life threatening, or significantly impact the environment or the quality of life. The WWRP aims to accelerate progress in the skill and in the utilization of high-impact weather forecasts, including severe weather, hydrological and environmental events with strong, obvious detrimental effects (e.g., fog, heat waves, cold air outbreaks, air pollution episodes, sand and dust storms), but also less extreme everyday situations where an improved forecast can lead to significant economic benefits or other desirable effects. In terms of phenomena, WMO weather research includes middle latitude weather, tropical systems such as tropical cyclones and polar regions phenomenon where climate change is already evident. To benefit users and National Meteorological and Hydrological Services (NMHSs), WMO weather research emphasizes technology transfer, training and development of new services. The WWRP, including THORPEX, seeks to involve and benefit WMO Members in the developing world and in the least developed countries, particularly in development of regional research and training.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Improvements in weather products for use by the scientific community and decision makers based on the assessments of the latest weather research findings;
- Completion of internationally coordinated weather research initiatives and/or forecast demonstration (or R&D) projects to improved prediction, information and services;
- Published reports on scientific consensus of major weather research topics and directions.

KO 5-3: WMO will promote global observations, research and analyses of the chemistry of the atmosphere to reduce environmental risks to society, meet the requirements of environmental conventions, strengthen capabilities to predict climate, weather and air quality; and contribute to scientific assessments in support of environmental policy.

The Global Atmosphere Watch (GAW), a component of the WMO integrated global observing system, provides essential information and knowledge for use in: (i) reducing loss of life and property from natural and human induced disasters; (ii) a better understanding of environmental factors affecting human health; (iv) understanding, assessing, predicting, mitigating and adapting to climate variability and change; (vi)

improving weather, forecasting and warning and (v) supporting sustainable agriculture and combating desertification. GAW provides important guidance, information and coordination for several conventions including the UNFCCC, the Vienna Convention on the Protection of the Stratospheric Ozone Layer, and the Convention on Long-Range Transboundary Air Pollution. It is also implementing actions on three important Essential Climate Variables (ECVs), namely, greenhouse gases, ozone and aerosols within the GCOS Implementation Plan. Numerical weather prediction research and operations are increasingly assimilating aerosols and ozone observations to improve weather forecast as well as deliver air quality forecasts.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Internationally coordinated atmospheric chemistry research initiatives contributing directly to improved global observations, assessments, prediction, information and services;
- Published technical reports, measurement guidelines, observational strategies and scientific analyses relating atmospheric chemistry to weather, climate, water and the environment;
- Assessments of the community consensus on the chemical state of the atmosphere

KO 5-4 WMO will further efforts through the activities of the NMHSs and national research partners to extend the WWRP-THORPEX Global Integrated Forecast System approach to improve short-term forecasts of climate, water and the environment from months to seasons.

The Global Integrated Forecast System approach, based on the recommendations of the EC Research Task Team, is supportive of the Global Framework for Climate Services through enhancing climate, weather, water and environmental predictions and the linkage to climate services and will support interdisciplinary cross-cutting research activities at the climate-weather interface served by activities of the joint WCRP/CAS Working Group on Numerical Experimentation (WGNE).

Typical Key Performance Indicators (KPIs) include inter alia:

- Implementation of the WWRP-THORPEX Global Integrated Forecast System by NMHSs.
- Evaluation of skill improvement in monthly to seasonal forecasting systems, resulting from research and development projects
- Model improvement due to better simulations of clouds, precipitation and tropical convection.

ST 3: Strengthening Capacity Building

ER 6: Enhanced capabilities of NMHSs, in particular in developing and least developed countries, to fulfill their mandates.

KO 6.1: Improved regional coordination and strengthened institutional development of the NMHSs and Regional Centres, particularly in developing and least developed countries, making a strong contribution towards meeting the needs of the various socio-economic sectors and achieving development goals at local, country and regional levels.

For many NMHSs and Regional Centres, particularly in developing and least developed countries, institutional capacity building is needed to improve management, planning and policy development skills, WMO will also assist with the development of relevant legal

instruments or legislative frameworks to clarify their mandates at national and regional level. WMO, in cooperation with international and regional development partners will improve the institutional framework, coordination mechanisms and leadership skills of the NMHSs.

WMO support for NMHSs and Regional Centres' activities in advocacy -- including the valuation of socio-economic benefits of weather, water and climate services, improved strategic planning in line with national priorities and strengthened regional cooperation – will enable the NMHS to gain a higher profile, an enhanced status, and the corresponding financial and governmental support. As a consequence, NMHSs will be appropriately positioned to make contributions to various socio-economic sectors and to the achievement of development goals at local, national and regional levels.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Number of NMHSs and WMO Regional Centres with defined roles in national and regional socio-economic development consistent with relevant WMO's global and regional policies and strategic plans;
- Number of NMHSs with programmes and networks for collaboration in service delivery at regional levels, consistent with the wider WMO policies and plans;
- Number of WMO Regions and NMHSs with evidences of collaboration with their counterparts on socio-economic and multilateral development issues.

KO 6.2: Improved weather, water and climate observing and monitoring infrastructure and operational facilities in NMHSs and Regional Centres, particularly in developing and least developed countries.

The NMHSs and Regional Centres have basic systems and physical infrastructure for data collection, processing, analysis, forecasting to support the production and delivery of improved weather, water and climate products and services for society and in support to decision making including disaster risk reduction and adaptation to climate variability and climate change. To meet the current and future demands of their governments and public and private sectors, systems and infrastructure will need to be improved with special attention to a broad-based development of Climate Services Information System of the Global Framework for Climate Services.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Successful completion of projects to address identified deficiencies and gaps in defined minimum requirements for infrastructure and operational facilities of NMHS;
- -Number of NMHSs with improved ment in-infrastructure and operational facilities, as well as with modernized capacity to develop and disseminate wider range of products to their Consumers, as a result of WMO interventions. Number of NMHSs with modernized capacity to develop and disseminate products to their Consumers.

KO 6.3: WMO will strengthen the **human resources development** activities at national and regional levels to assist NMHSs, especially those in developing and least developed countries, in meeting national and regional research needs. .

Human capital is the most important factor in the success of public services and needs constant and continuing attention. Developing the capabilities of the staffs in the NMHSs is an urgent priority especially in emerging areas, such as climate change adaptation and integrated management of water resources.

Typical Key Performance Indicators (KPIs) include, inter alia:

- NMHSs staff trained in meteorology, climatology, hydrology and related geosciences

fields and allied disciplines for effective and efficient service delivery.

- Index on the level to which WMO has been able to accomplish training on priority areas including climate services and the assessment of socio-economic benefits, water resources management, and management of NMHSs;
- Training Index on the level to which WMO has been able to accomplish training in support of NMHSs quest for improvement in number of competent staff for professional qualifications and expertise of NMHSs staff receiving basic training, specialized training, or fellowships, e.g., number of Members having certified climate service specialists.

KO 6.4: Increased financing and technical and technology support from internal and external sources through **mobilize extrabudgetary resources** to enhance the capacity of NMHSs to play key roles in national development activities through cooperation and partnerships with other national and regional organizations.

Activities which support the WMO's objectives but which are not provided for in the regular budget are financed from voluntary extra-budgetary contributions. These include technical co-operation projects, projects which supplement its Regular Programme and major trust funds financed partially from the Regular Budget and partially from cost sharing arrangements with other organisations.

WMO will continue seek to support NMHSs and WMO Technical Programmes to enhance the level of in-country and external support and funding to programmes and projects aimed at improvement of the NMHSs to help them establish the level of services needed to support the protection of life, property and environment as well as the security of food production, energy and water resources, with particular emphasis on the developing countries, LDCs and SIDS. In this effort it will be critical to demonstrate the real socio-economic value of investments in, and the contribution of WMO and NMHSs.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Amount of Financial support mobilized to support NMHSs development projects within each financial period, e.g., for the VCP , regional development projects and regular activities;
-
- Impacts of the identified priority projects implemented within each financial period.
- National Government perspective on effectiveness and value of their NMHSs products and services
- National clients perspective on effectiveness and value of their NMHSs products and services
- Number of new strategic partnerships established ;

ST 4: Building and enhancing partnerships and cooperation

ER 7: New and strengthened partnerships and cooperation activities to improve NMHSs' performance in delivering services and to increase the value of the contributions of WMO within the United Nations system,

relevant international conventions and national strategies.

KO 7.1: WMO will enhance existing efforts and **linkages with UN, other international and regional organizations** as well as with NGOs and IGOs.

WMO will emphasize participation within the UN system in various forums, such as the UN Chief Executives Board and the UN Conventions (i.e., UNFCCC, UNCCD and UNCBD), especially through their Conference of Parties (COPs) and their subsidiary bodies on scientific technological advice (SBSTAs). Implementing the GFCS will be a vehicle for WMO taking a leading role in UN delivering as One on Climate knowledge (with UNESCO) and will involve extensive collaboration with UN agencies (e.g., UNDP, UNEP), national and local governments, non-governmental organizations (e.g., WB/GEF, regional development banks), civil society, the private sector, as well as universities and research institutions around the world. Further WMO will continue to contribute to the implementation and follow-up processes of major international programmes of action (e.g. Hyogo on disaster risk reduction, Nairobi Workplan on Adaptation, Brussels on LDCs).

Typical Key Performance Indicators (KPIs) include, inter alia:

- Reporting to international conventions, particularly the UNFCCC, UNCCD, UNCBD and enhanced interaction with their SBSTAs and COP processes;
- Active partnerships between WMO and key institutions of Members, the United Nations system, other international organizations, NGOs, boundary organisation and the private sector;
- New or enhanced cooperative efforts between WMO and other organizations (e.g., water resources with UNESCO-IHP and UN-Water, climate, natural hazards, air quality).

KO 7.2: WMO will develop and manage co-sponsored programmes and initiatives through specific agreements with relevant contributing sponsors. WMO will seek to enhance its support of cooperative efforts, as a strategic partner, on the Millennium Development Goals.

WMO has developed and is the current manager of several co-sponsored programmes (e.g. IPCC, WRCP and GCOS) through specific agreements with relevant contributing sponsors (e.g., IOC of UNESCO, ICSU, UNEP, FAO). WMO has participated in supporting cooperative efforts, as a strategic partner, on the Millennium Development Goals (MDGs), in particular with FAO and WFP on food security, ILO and WHO for social protection, UNEP for the green economy.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Increased visibility and initiatives of WMO in the activities of co-sponsored programmes;
- Impact of reports, bulletins, and other outputs on decision-makers;
- Visitors to the climate knowledge base portal.

KO 7.3 WMO will strengthen their participation and involvement of NMHSs in and build **partnerships with other organizations in national decision-making processes**, especially, related to disaster risk reduction, climate adaptation and water resource management by providing accurate and timely weather, climate and water resource information for use by their governments and national agencies.

Within most national governments, the NMHSs are the authoritative agencies on the scientific aspects of weather and climate information and impacts and deliver the official forecasts and warnings to the government and the population on both extreme weather

and climate events, many times in partnership with national civil protection and hazard response agencies. In many countries they also are responsible for services related to hydrology and water resources and for crucial socio-economic sectors such as agriculture and aeronautical and marine meteorological services.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Impact of reports, bulletins, and other outputs on decision-makers;
- NMHSs having active partnerships for service delivery at national and regional levels.

ST 5: Strengthening good governance

ER 8: An effective and efficient Organization

KO 8.1: WMO Secretary-General will improve the **effective and efficient functioning of the constituent bodies;**

The WMO support services are a key factor in the efficient functioning of the constituent bodies by providing for translation, interpretation, and meeting planning functions,

Typical Key Performance Indicators (KPIs) include, inter alia:

- Improvements in the quality of technical services (interpretation, conference services and facilities) measured through the satisfaction of Members;
- Improvements in the quality of substantive services (documents and presentations to constituent bodies) measured through the satisfaction of Members;
- Reduction in the cost of constituent body sessions.

KO 8.2: WMO Secretary-General, with guidance from the Executive Council, will ensure the effective and efficient **operation and oversight** of the organization

Given the difficult fiscal environment and the level of management and financial oversight by the Executive Council and others, a management priority exists for improving the efficiency, effectiveness and transparency of the programmatic and financial management of the organization. This will include developing a visionary Strategic Plan, a clear and effective WMO Operating Plan and an efficient and transparent Budget for the Financial Period 2012 – 2015.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Targets achieved timely and cost effectively by key programme support services; e.g., compliance with WMO Financial Rules and Regulations and relevant legislative mandates;
- Development of the requisite planning and budgeting documentation as determined by the satisfaction of Members
- Oversight recommendations implemented for improved business effectiveness and efficiency, e.g., from External Auditor and EC subsidiary bodies

KO 8.3: WMO Secretariat will facilitate and assist the organization in **delivering its core activities efficiently and cost-effectively.**

The WMO support services provide valuable expertise, advice and services in the planning, organization of meetings, conference and other related activities. These

services include, inter alia, translation, interpretation, and organizational activities, essential in the conduct of meetings and conferences, and a range of services essential in producing attractive, readable and accurate documentation, publications and other communication materials on all aspects of WMO's activities.

Typical Key Performance Indicators (KPIs) include, inter alia:

- Achievement by the Secretariat of agreed targets pertaining to key support services;
- Survey of users and analyses of the cost benefit of WMO support services.

MONITORING AND EVALUATION

In results-based management, monitoring and evaluation (M&E) are tools to measure the performance of the Organization and the achievements with respect to the implementation of the WMO Strategic Plan. Monitoring and evaluation also contribute to identifying good practices and lessons learned with respect to implementation as well as policy, strategy and programmatic design. They provide information for ensuring the continuing effectiveness and relevance of the WMO Programmes. The evaluation results are important inputs to the strategic planning process and are used to adjust strategic direction and priorities, if required.

Whereas monitoring is an ongoing function, annual evaluations are conducted and results are reported to the constituent bodies of WMO, in particular the Executive Council.

The M&E procedures and practices are defined in the WMO Monitoring and Evaluation System, the fourth WMO results-based management building block².

Monitoring and evaluation of the implementation of the WMO Operating Plan and Secretarial Budget is the joint responsibility of WMO constituent bodies, Members and the Secretariat.

² The WMO results-based management building blocks are: The WMO Strategic Plan, WMO Operating Plan, WMO Results-based Budget (RBB) and WMO Monitoring and Evaluation System (see

CONCLUSION

Progress in improving the quality, timeliness and utility of weather, climate, water and related environmental predictions and assessments has been made possible by the cooperation of all nations in contributing and sharing observations of the Earth system from the local to the global scale. In turn, advances in data assimilation techniques and numerical models have resulted in better forecast products and services. At the same time, societies have become increasingly sensitive to weather, climate and hydrological phenomena. More and more people are vulnerable to natural hazards, and national economies are becoming increasingly sensitive to the day-to-day variability of the weather. While weather, climate and water impact people locally, the Earth system is responsible for these phenomena on a global scale. Thus, local forecasts and assessments depend on cooperation between neighbouring countries, within regions and throughout the entire global community to provide data and global and regional products. This dependence of countries on each other for weather, climate and water information is the principal reason for the existence of WMO, which provides the forum for the exchange of data, the transfer of technology and expertise and the sharing of knowledge.

While societies benefit from continuing scientific and technological progress, the full benefit of weather, climate and water forecasts products and services is yet to be realized. Recognizing that people and economies are more vulnerable today is the first step towards developing decision processes that utilize environmental information more effectively. The WMO Strategic Plan under-scores the importance of service delivery to improve the interaction between providers and users of weather, climate and water products and services. The Plan also recognizes that the changing needs of society require new tools and techniques. It therefore encourages science and technology development and implementation and ensures equal access to information that is vital for human development. The Plan emphasizes capacity-building as an essential element to achieve internationally agreed development goals and reduce the risks to development from disasters and climate change. WMO Members have always stressed the need for partnership, particularly among themselves. Today's problems transcend scientific, political and organizational boundaries. The Plan recognizes that protecting lives and livelihoods, and enhancing economic development, require extensive partnerships and that, to achieve its objectives, the Organization itself must focus on efficient management and good governance.

WMO Members are addressing some of the critical problems of the age. The WMO Strategic Plan provides direction for the Organization to achieve its objectives.

APPENDICES

I. THE ORGANIZATION OF WMO

What is WMO?

WMO is an intergovernmental organization with a membership of 188 States and Territories. It originated from the International Meteorological Organization, which was founded in 1873. Established in 1950, WMO became a specialized agency of the United Nations in 1951. According to Article 4 of the Convention, the World Meteorological Organization comprises:

- (1) The World Meteorological Congress;
- (2) The Executive Council;
- (3) Regional meteorological associations;
- (4) Technical commissions;
- (5) The Secretariat.

A more complete description of WMO is given in Appendix I.

- The World Meteorological Organization is an intergovernmental organization with a membership of 188 Member States and Territories. It originated from the International Meteorological Organization, which was founded in 1873. Established in 1950, WMO became a specialized agency of the United Nations in 1951. Its mission is to provide world leadership in expertise and international cooperation in **weather, climate, hydrology and water resources**, and related environmental issues, thereby contributing to the safety and well-being of people throughout the world and to the economic benefit of all nations.
- WMO is the authoritative voice of the United Nations system on the state and behaviour of the Earth's atmosphere, its interaction with the oceans, the climate it produces and the resulting distribution of water resources;
- Cooperative efforts of WMO Members have produced and maintain a global observing system of environmental satellites and complementary Earth-based systems, a global telecommunications system to share critical information quickly and efficiently and a global data-processing and forecasting

system for monitoring, assessment and prediction. These collaboratively produced capabilities have allowed nations of the world to exploit scientific advances with a view to improving significantly severe weather warning, forecast accuracy, climate and hydrological assessments over what they were in the 1950s;

- WMO facilitates the free and unrestricted exchange of data and information, products and services in real or near real time on matters relating to the safety and security of society, economic welfare and the protection of the environment. It contributes to policy formulation in these areas at the national and international levels;
- WMO facilitates worldwide cooperation in observing networks; promotes the establishment and operation of systems for the rapid exchange of information; furthers the application of weather, climate, water and related environmental information to agriculture, development, transport, water resources, health and many other human activities; promotes activities that further close cooperation between National Meteorological and Hydrological Services; supports cooperation between providers and users of their services; and encourages and coordinates international aspects of research and training.
- WMO plays a leading role in international efforts to monitor and protect the environment through its Programmes. For instance, in cooperation with United Nations agencies and the National Meteorological and Hydrological Services of its Members, WMO supports the implementation of relevant conventions such as the United Nations Framework Convention on Climate Change, the United Nations Convention to Combat Desertification and the Vienna Convention for the Protection of the Ozone Layer and its Protocols and Amendments. WMO is instrumental in providing advice and assessments to governments on matters relating to the above conventions.
- Since its creation, the collective efforts of WMO have developed institutions; trained thousands of meteorologists, climatologists, hydrologists and atmospheric chemists; contributed to establishment of United Nations framework conventions; produced a Global Observing System for Earth based and satellite based observation; implemented Global Telecommunications System to share critical information quickly and efficiently; and developed Global Data processing and Forecasting System to monitor, assess and predict weather, climate, water and other environmental conditions that affect society. These combined capabilities have allowed nations of the world to exploit scientific advances with a view to improving severe weather warnings, day-to-day forecast accuracy and climate and hydrological assessments. WMO is focused on taking the next essential steps to address society's critical environmental and developmental needs.

- The World Meteorological Congress, which determines the policy of WMO; every four years the Member countries send representatives to this Congress;
- The Executive Council, which is composed of 37 directors of National Meteorological or Hydrometeorological Services; it is the executive body of the Organization responsible for implementing the decisions of Member countries and meets annually;
- Six regional associations, which allow Members to address their regional concerns;
- Eight technical commissions, which bring together the world's foremost experts in the basic systems for observing, telecommunications and data processing, systems in support of all WMO Programmes, instruments and methods of observation, hydrology, atmospheric sciences, aeronautical and agricultural meteorology, oceanography and marine meteorology and climatology. They provide technical recommendations for the work of Organization and of the National Meteorological and Hydrological Services throughout the world.
- The Secretariat, which coordinates the activities of WMO with a regular staff of some 250 employees headed by the Secretary-General, who is appointed by the World Meteorological Congress.
- The Organization has a President and three Vice-Presidents, who are also President and Vice-President of Congress and of the Executive Council.

Each Member is represented by a Permanent Representative with WMO, who acts on technical matters for that Member between sessions of Congress and who is the normal channel of communication between the Member and the Organization. The Permanent Representative should be the director of the National Meteorological or Hydrometeorological Service. Permanent Representatives are expected to maintain contact with the competent governmental or non-governmental authorities in their respective countries on all matters concerning the Organization's work. This role is becoming increasingly important as WMO Programmes make greater contributions to the integrated approaches to issues relating to the physical environment. Many Permanent Representatives have formally designated hydrological advisers.

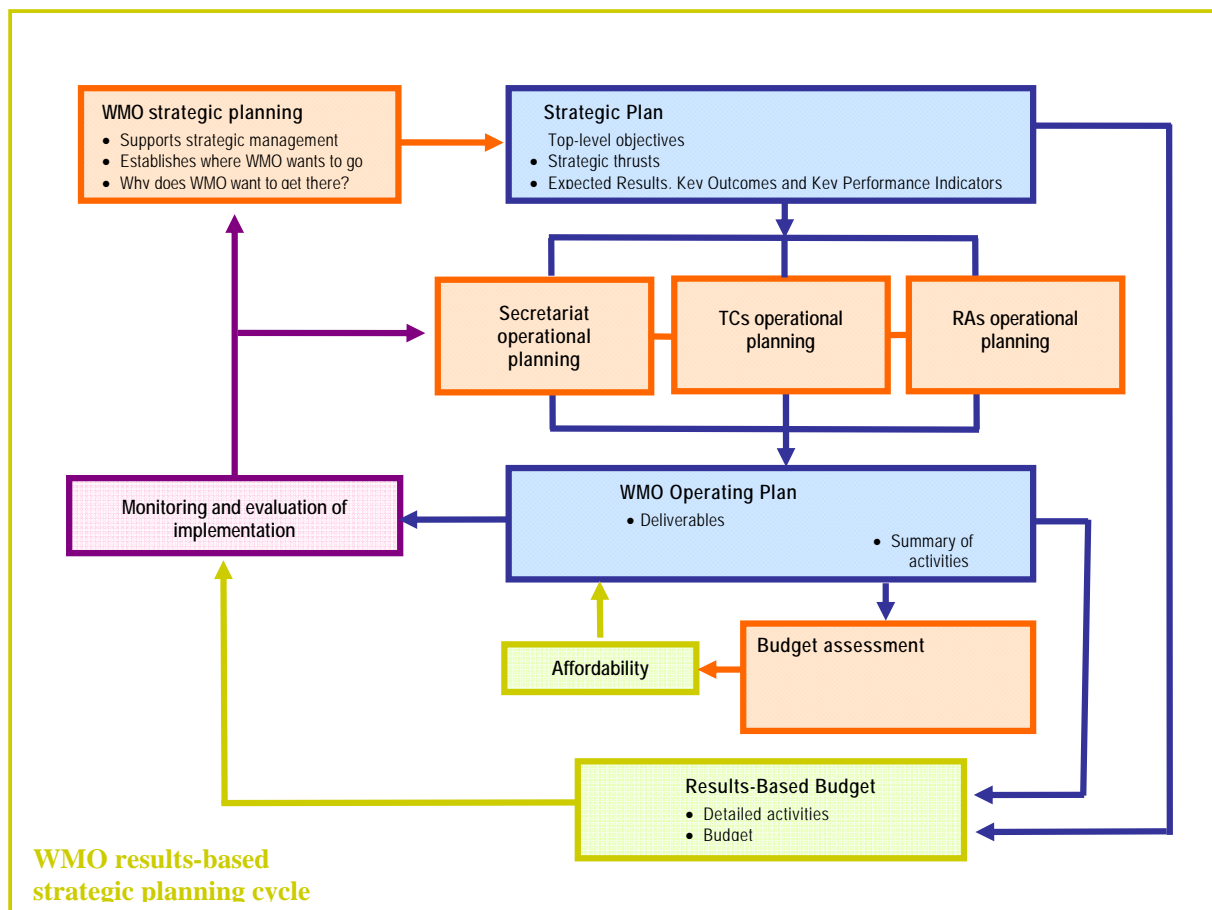
WMO's scientific and technical programmes are designed to assist all Members in providing, and benefiting from, a wide range of meteorological and hydro-logical services and to tackle present and emerging problems. Programme are based on the concept and experience showing that mutual benefits are gained from cooperative use of the pool of knowledge and applications that have been, and are still being, generated by the worldwide sharing of meteorological, hydrological and related information among Members. WMO Programmes enable the provision of meteorological and related services in all countries at costs far below those that would be incurred if each Member acted alone.

II. THE WMO RESULTS-BASED STRATEGIC PLANNING PROCESS

The fifteenth WMO Congress (Geneva, May 2007) established result-based management as the fundamental concept for managing the planning, implementation and performance assessment of WMO's programme activities.

The WMO result-based management concept provides a coherent framework for setting objectives and determining strategies, budgeting, monitoring, and evaluating organizational performance (illustrated in the figure below) and consists of four major building blocks:

- WMO Strategic Plan (SP), which provides a high-level statement of future directions and priorities of the Organization;
- WMO Operating Plan, which converts strategic directions into specific, measurable outcomes;
- WMO Results-based Budget (RBB) which connects expected results with resources;
- WMO Monitoring and Evaluation System, which tracks implementation and identifies areas where corrective action is required in order to achieve expected results.



The overall purpose of strategic planning in WMO is to set broad objectives and strategies for the Organization.

The strategic planning process begins with the inclusion of input from Members in a draft planning document that is reviewed and approved by the WMO Congress. This serves as a basis for a more detailed Operating Plan which outlines the deliverables and activities of the Organization and is used as a basis for the results-based budgeting process.

WMO Strategic Plan

The WMO Strategic Plan is a document that sets the strategic course for the Organization. It is the result of a Member-driven process to identify Organization-wide needs and priorities and establishes the focus for the Organization's four-year financial period. There is one Strategic Plan for the Organization. It is formally reviewed and approved by the WMO Congress one year prior to the beginning of the WMO financial period.

The Strategic Plan, which describes the purpose and direction of the Organization, contains the following items:

- Top-level objectives, high-level imperatives for the Organization;
- Strategic thrusts, the Organization's response to specific needs, including strategic initiatives targeted for action;
- Expected results, key outcomes and performance indicators, highlighting those end results to be achieved during the financial period and the associated performance measures.

Collectively, these elements support strategic management within WMO by establishing the basis for the Organization's operational planning process.

Necessary adjustments in direction and strategies are informed by performance information generated by monitoring and evaluation as well as changing global needs and priorities.

WMO Operating Plan

The WMO Operating Plan is designed to translate the top-level objectives, expected results and key outcomes described in the Strategic Plan into specific initiatives and projects, which are needed to achieve the desired outcomes. The WMO Operating Plan is comprehensive in that it distinguishes the contribution of WMO Members, technical commissions, regional associations and the Secretariat. The WMO Operating Plan also serves as a foundation for the WMO results-based budget.

The WMO Operating Plan is build upon the following elements:

- Programme deliverables and activities, which provide specific approaches to address the expected results and key outcomes;
- Cross-cutting initiatives and other mechanisms for achieving the expected results;
- Performance metrics to assess progress in the implementation of the WMO Operating Plan;
- Mechanisms for monitoring and evaluating the implementation of the WMO Operating Plan.

WMO Budget

The WMO Budget is a results-based budget in which resource justification is the end product of a process in which the Secretariat, working with regional associations and technical commissions, identifies specific activities and initiatives to be completed in order to achieve the expected results and key outcomes and the associated required resources. The process consists of a four-year budget proposal prepared by the Secretariat following the financial guidance provided by the WMO Executive Council. The proposal is formally submitted for review and approval to Congress.

The WMO results-based budget determines the affordability of the Organization's programme activities. It is an iterative process that refines WMO's priorities by adjusting the programmes to operate according to predetermined financial guidance, while sustaining the strategic direction established by the Strategic Plan. The end result is a results-based budget for the Secretariat containing the following items:

- A logical framework for informed budgetary decision-making, which provides the objectives, expected results, outputs to be delivered, resources to be used and performance indicators;
- Resource justification by results, which is designed to optimize the use of resources and improve the Secretariat's responsiveness to meet Members' needs;
- Incorporation into the budgetary decision-making process of performance measures gauging progress towards delivery of the key performance targets against resources spent.

WMO Monitoring and Evaluation System

The WMO Monitoring and Evaluation System facilitates the ongoing review of the implementation of the WMO Strategic and Operating Plans and ensures that performance information is generated to inform and support decision-making at all levels of the Organization.

The specific objectives of the WMO Monitoring and Evaluation System are to:

- enable programme managers to objectively track progress and the impact of the Organization's activities, enhance the performance and identify areas where corrective action is required;

- drive subsequent management actions for modifications in implementation of the WMO Operating Plan and contribute to adjusting to changes in Members' priorities and/or resources;
- enable the Secretariat to demonstrate organizational effectiveness, efficiency, accountability and transparency to the WMO governing bodies;
- facilitate dialogue and discussions internally within the Organization, and externally with partner organizations, donors as well as other stakeholders.

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