

**STRATEGIC PLAN FOR THE ENHANCEMENT OF NATIONAL
METEOROLOGICAL AND HYDROLOGICAL SERVICES IN RA II (ASIA)
(2009-2011)**

This document contains the core of the RA II Strategic Plan. It takes into account the framework of the WMO Strategic Plan (i.e., eleven Expected Results grouped within five Strategic Thrusts under three Top-level Objectives). The regional consideration for each of the five WMO Strategic Thrusts is presented. Thereafter, under the relevant WMO Strategic Plan Expected Results, Regional Expected Results are identified which will serve as the common regional basis for action. Listed under each of the Regional Expected Results are the areas where deliverables are expected, through cooperation among Members, especially their NMHSs, for enhanced provision, access, operation or capability. Associated key targets, baselines and performance indicators, as well as identified relevant activities will be presented in the Action Plan, currently referred to as Appendix III. *It will be desirable to identify a few priorities among those listed under each Regional Expected Result; this will serve as guidance to Members.*

Strategic Plan for the Enhancement of NMHSs in RA II (2009-2011)

WMO Top-level Objective 1

To produce more accurate, timely and reliable forecasts and warnings of weather, climate, water and related environmental elements

WMO Strategic Thrust 1

Science and Technology Development and Implementation

There is increasing demand to provide more weather-, climate- and water-related comprehensive services to satisfy the increasing multi-faceted requirements of end-users; and so provide benefits to the safety and well-being of people, sustainable development and environmental protection. To respond to this, there is a need to further ensure that the relevant scientific and technological infrastructures in the Region are in place for the appropriate *science and technology development and implementation* to take place. The Region has some advanced scientific and technological expertise within world-class institutions, such as in some Members' NMHSs, academia and in industry. Improved cooperation among Members can help develop the scientific knowledge and technical infrastructure to meet the requirements for more comprehensive services. Such areas include improved quality, range, use and timeliness of the basic data necessary for the production of weather forecasts, climate predictions and hydrological assessments, through ground-based or satellite observing systems; utilizing new technologies to improve the timeliness of the exchange of data and products; and improved modelling to forecast a greater range of natural hazards at longer lead times.

In this connection, RA II will work towards:

- (i) Improving the knowledge of meteorological and hydrological processes and understanding of the requirements of the user community regarding the accuracy and usefulness of the analysis, forecasts, warnings and risk assessments of meteorological, hydrological and related hazards and impacts of environmental changes;
- (ii) Further developing and capitalizing on existing infrastructures, mechanisms and organizations in order to better respond to increased users' requirements, especially through the involvement of all stakeholders;
- (iii) Modernizing the RA II meteorological, hydrological and related infrastructure, including by associating the capabilities of NMHSs, regional and sub-regional organizations with those of possible partners, where appropriate;
- (iv) Preserving and further developing the hydrological infrastructure for monitoring and forecasting the quantity and quality of both surface water and groundwater;
- (v) Ensuring that the Region develops an improved efficient and effective infrastructure to significantly contribute to, and more fully benefit from, the global WMO systems; and
- (vi) Ensuring that the Region plays its part in, and benefit from, the effective operation and delivery of a global multi-hazard early warning system, including on disaster preparedness and climate change.

In light of the above, RA II will try to achieve Regional Expected Results, in the context of the Expected Results identified in the WMO Strategic Plan approved by Fifteenth Congress in 2007.

1. WMO Expected Result 1

Enhanced capabilities of Members to produce better weather forecasts and warnings

Regional ER1(a): Upgrade in Members' capability and infrastructure in respect of NWP activities including high-speed computers, use of EPS (Ensemble Prediction System) products and nowcasting of high-impact weather	
Deliverable: (Listed under this heading are the areas where deliverables are expected, through cooperation among Members, especially their NMHSs, for enhanced provision, access, operation or capability. Key targets, baselines and performance indicators, as well as identified relevant activities are presented in the Action Plan, currently Appendix III of this document.)	
1.1	Migration from lower-speed Category I (below 100 GFLOPs) computer systems to higher-speed Category II (100 to 1000 GFLOPs) and III (over 1000 GLOPs) systems
1.2	Automatic data reception, decoding and archival; automatic data visualization; and automatic data processing
1.3	Assimilation of remote-sensing and other asynoptic data in NWP (e.g., using variational analysis)
1.4	Operational NWP model(s) runs
1.5	Operational access to NWP products from major centres
1.6	Effective use and interpretation of all NWP products in forecasting operations
1.7	Systematic comparison of the skills of various models in predicting weather parameters in subregions
1.8	Operational nowcasting system for high-impact weather warning
1.9	Operational use and interpretation of EPS (Ensemble Prediction System) products and probability forecasts
1.10	Development and production of weather indices for the public, e.g., ultraviolet radiation index, heat/cold stress index
1.11	Development and implementation of UVI (ultraviolet index) forecast
1.12	NWP forecasts and warnings on sand/dust storms
Regional ER1(b): Enhancement in Members' capabilities in producing specialized aeronautical, marine and tropical cyclone forecasts and warnings	
Deliverable:	
1.13	Operational reception of OPMET data
1.14	Operation of WAFS satellite receiving equipment
1.15	Reception of WAFS products operationally through other channels
1.16	Producing marine forecasts/warnings for coastal waters including sea state and wave/swell
1.17	Producing marine forecasts/warnings for high seas
1.18	Increased accuracy, timeliness and usefulness of tropical cyclone forecasts and warnings
1.19	Extended use of Ensemble Prediction System (EPS) and consensus technique for tropical cyclone forecasting
1.20	Implementation of probabilistic forecast of tropical cyclones
Regional ER1(c): Encouraging Members' observation of the principle of free and unrestricted international exchange of relevant data and products among Members	
Deliverable:	
1.21	Promotion and strengthening of the principle of free and unrestricted international exchange of data and products among Members, particularly their NMHSs

2. WMO Expected Result 2

Enhanced capabilities of Members to produce better climate predictions and assessments

Regional ER2(a): Upgrade in Members' capability in observation and in development of climate services and prediction to meet users' diverse requirements in respect of sustainable development	
Deliverable:	
2.1	Climatological stations operated/supervised by Members
2.2	Climate variables measured and processed
2.3	Issuance of climatological statistics and indices and make them easily available and delivered to users
2.4	Climate-related bulletins/publications issued
2.5	Number of users receiving climatological products periodically
2.6	Provision of monthly/seasonal climate prediction
2.7	Monitoring climate change and climate variability
2.8	Provision of meteorological and climatological information for the sustainable use and conservation of natural resources
2.9	Marine observations and providing data to support global and regional climate studies, including participation in GLOSS (Global Sea Level Observing System) to monitor long-term sea-level changes associated with global warming
2.10	Meeting the needs for climate information of user sectors such as health, tourism, energy and building, as well as the public
Regional ER2(b): Enhanced capability in the provision of products, services as well as policy-relevant assessments and advice in support of adaptation strategies and mitigation measures to alleviate the impacts of climate change	
Deliverable:	
2.11	Maintenance of metadata records for their observation stations
2.12	Maintenance of records of proxy data related to climate change (tree rings, vegetation extent, etc.)
2.13	Adoption of innovative agrometeorological adaptation strategies in face of climate variability and climate change
2.14	Sector-specific periodic publications (e.g., health, tourism, energy and building)
Regional ER2(c): Enhanced cooperation in climate research and services provision through the establishment of Regional Climate Centres (RCCs) and possibly sub-regional centres in RA II;	
Deliverable:	
2.15	Establishment of the Regional Climate Centres (RCCs)
2.16	Establishment of specialized sub-Regional Centres where Members identify a need
2.17	Provision and wide use of products and services issued by RCCs
2.18	Specific RCCs products addressing sub-regional requirements
2.19	Participation in regional or sub-regional climate research

3. WMO Expected Result 3

Enhanced capabilities of Members to provide better hydrological forecasts and assessments

Regional ER3(a): <i>Improvement in Members' capability in observation and development of products and services for the user community, including flood/flash flood and landslide/debris flow warnings</i>	
Deliverable:	
3.1	Growth in spatial and temporal coverage of hydrological observation networks
3.2	Growth in number and frequency of hydrology-related publications issued by NMHSs
3.3	Reliability of maintenance procedures for measurement and equipment (including gauges) in hydrological stations
3.4	Reliability of quality control procedures applied on data collected from hydrological stations
3.5	Real-time reporting of hydrological data from networks including from remote stations
3.6	Hydrometric measurements with quality and accuracy
3.7	Calculation of runoff with quality and accuracy
3.8	Estimation of sedimentation rates and sediment budgets with accuracy
3.9	Measurement of changes in river flow in snow/glacier-fed rivers (to assess effect of climate change and climate variability)
3.10	Issuance of flood warnings and constantly improving upon them
3.11	Issuance of flash flood warnings and constantly improving upon them
3.12	Issuance of landslide/debris flow warnings and constantly improving upon them
3.13	Improvement in warnings capability through enhanced and effective cooperation with other NMHSs
3.14	Contribution towards Integrated Flood Management (IFM)
Regional ER3(b): <i>Upgrade in Members' capability in monitoring changes in hydrological parameters and in assessing water availability especially in light of climate change</i>	
Deliverable:	
3.15	Assessment of basin-wide water resources availability, including use of climate predictions
3.16	Measurement and estimation of other forecasting and assessment relevant hydrological variables
3.17	Implementation of Water Resources Assessment (WRA)
3.18	Improved contributions to Integrated Water Resources Management (IWRM)
3.19	Improved management of lakes and reservoirs
3.20	Improved knowledge for catchment management
3.21	Contribution to adaptation relating to changes in water resources availability (including trends and outlook)
3.22	Enhanced preparedness to predict and manage hydrological droughts
3.23	Improvement in building knowledge and assessments for decision-making at national and regional levels
3.24	Improvement in adaptation capacity of water resources systems in a changing climate
3.25	Improvement in capacity for water-related disaster management (Hydrological extremes)
Regional ER3(c): <i>Encouragement of Members to contribute to, and benefit from, appropriate databases, resources and expertise</i>	
Deliverable:	
3.26	Participation in the Hydrological Information Referral Service (INFOHYDRO)
3.27	Participation in national/regional joint activities/programmes involving hydrologists, meteorologists and the climate communities
3.28	Access to, and appropriate use of, relevant new technologies through improved exchange mechanisms in the context of HOMS
3.29	Improved development, adaptation and use of hydrological models for forecasting and assessments
3.30	Participation in the planning and implementation of the World Hydrological Cycle Observing System (WHYCOS)
3.31	Improved access and use of national, regional and global hydrological data and information for water-related projects and scientific programmes within and beyond the Region
3.32	Improvement in strategic planning capability
3.33	Improvement in institutional management capability
3.34	Development of national and regional capacity building programmes and related training activities

4. WMO Expected Result 4
Integration of WMO observing systems

Regional ER4(a): Upgrade in Members' capability in maintaining and developing their meteorological observation networks and in implementation of additional equipment/systems to meet users' needs	
Deliverable:	
4.1	New synoptic stations in the national observation network
4.2	New upper-air stations in the national observation network
4.3	Regular maintenance and calibration of observation instruments
4.4	Reliability of quality management routines and procedures of weather observations
4.5	Real-time delivery of measured observations at remote stations
4.6	Enhanced temporal and spatial coverage of weather measurements
4.7	Availability of qualified maintenance technicians in NMHSs
4.8	Availability of calibration instruments in NMHSs
4.9	Maintenance/enhancement of operational Regional Basic Synoptic Network (RBSN) surface stations in the Region
4.10	Maintenance/enhancement of automatic weather stations (AWSs) in the Region
4.11	Maintenance/enhancement of rainfall stations in the Region
4.12	Maintenance/enhancement of operational RBSN upper-air stations in the Region
4.13	Maintenance/enhancement of operational Regional Basic Climatological Network (RBCN) stations in the Region
4.14	Maintenance/enhancement of operational GCOS surface stations in the Region
4.15	Maintenance/enhancement of operational GCOS upper-air stations in the Region
4.16	Maintenance/enhancement of operational weather radar stations in the Region
4.17	Maintenance/enhancement of ground station(s) in the Region to receive high-resolution images from geostationary meteorological satellites
4.18	Maintenance/enhancement of operational wind profiler stations in the Region
4.19	Maintenance/enhancement of lightning location networks in the Region
4.20	Maintenance/enhancement of Global Atmospheric Watch (GAW) stations in the Region
Regional ER4(b): Upgrade in Members' capability in maintaining and developing their marine and aviation observations and in implementation of additional equipment/systems to meet users' needs	
Deliverable:	
4.21	Maintenance/enhancement of operational tide gauges in the Region
4.22	Maintenance/enhancement of operational drifting and moored buoys
4.23	Maintaining/recruiting more voluntary observing ships (VOS) for meteorological, oceanographic and/or upper-air observations
Regional ER4(c): Encouragement of Members in collecting and exchanging non-conventional meteorological data for weather applications and disaster mitigation	
Deliverable:	
4.24	Collection/exchange of non-conventional meteorological data (such as precipitable water vapour derived from GPS, and observations related to renewable energy resources) for weather applications such as forecasting and modelling
4.25	Involvement in the planning and implementation of the Global Earth Observing System of Systems (GEOSS)
Regional ER4(d): More cost-effective operation and better supply of good quality data and products	
Deliverable:	
4.26	Monitoring and auditing routines and procedures to optimize use of resources in a cost-effective way in the administrative and technical operations of NMHSs
4.27	Ensuring the accuracy of the instruments they use
4.28	Routines and procedures to review the format, content and methods of delivery of hydrometeorological data and products to assure quality and maintain cost effectiveness
4.29	Periodic surveys targeting various users to monitor, and meet, their changing needs and requirements for data and products

4.30	Operation of AWSs on green technology (including use of renewable energy such as solar and wind power), for sustainable development
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5. WMO Expected Result 5

Development and implementation of the new WMO Information System

<i>Regional ER5(a): Upgrade in Members' telecommunications capability including circuits and connection to broadband Internet</i>	
Deliverable:	
5.1	Migration from low-speed Category I (below 9.6 kbps) to higher-speed Category II (9.6 to 64 kbps) and III (over 64 kbps) GTS connections to the Regional Telecommunication Hubs (RTHs)
5.2	Connection to the Internet by broadband
5.3	Connection to the Internet by telephone dial-up
5.4	Shift from the costly radiofacsimile broadcast of meteorological and oceanographic information in chart form to more economical modern communication means
<i>Regional ER5(b): Improved data and products exchange for RA II Members under WIS implementation</i>	
Deliverable:	
5.5	Implementation of the WMO Information System (WIS)
<i>Regional ER 5(c): Assistance and advice to Members on their migration plan to an extended use of Table Driven Code Forms (TDCFs)</i>	
Deliverable:	
5.6	Migration to WMO Table Driven Code Forms (TDCFs)

WMO Top-level Objective 2

To improve the delivery of weather, climate, water and related environmental information and services to the public, governments and other users

WMO Strategic Thrust 2
Service Delivery

Service Delivery in the areas of weather, climate and water significantly contributes to the safety and well-being of people and their livelihood; the security and productivity of socio-economic sectors such as agriculture, transport and energy thereby contributing to sustainable development; safeguarding the environment; as well as in contributing to policy-making in such issues as climate change, natural disasters and water resources.

The Region needs to respond to national, regional and global changes with their associated challenges and opportunities. These influence the range, scope and character of users' requirements for services and the circumstances in which service providers operate. For example, the expectation that climate change will affect the intensity and/or frequency of weather- and water-related hazards in the Region may require improved or different early warning services in many Members, as well as new or more comprehensive services related to environmental protection (e.g., air quality, water quality). Also, governments and economic sectors will require guidance to respond to climate change, particularly in relation to adaptation strategies to consider. Thus, the increased demand for more improved and varied services provides opportunities for the NMHSs to demonstrate their relevance and capability as well as to increase their visibility. In turn, the recognition of the socio-economic benefits of the services that NMHSs can provide, could very well lead to strengthened support for them.

In this connection, RA II will work towards:

- (i) Better understanding the relevant requirements of governmental bodies, economic sectors, media and general public to enable the provision of appropriate responses;
- (ii) Better use of capabilities in the Region, including the quality and completeness of meteorological and hydrological records for application in development planning, disaster preparedness, climate change responses and related issues;
- (iii) Working together to provide a broader range of sub-regional and regional services;
- (iv) Working together to share and implement best practices and optimize the use of available capabilities and resources to improve service production and delivery within the Region;
- (v) Creating and monitoring important mechanisms that contribute to sustainable development;
- (vi) Closely following up and documenting the pertinent evolving needs, trends and developments with a view to identifying challenges to address and opportunities to avail; and
- (vii) Assessing and documenting the socio-economic benefits of weather-, climate- and water-related services and other relevant activities in the Region, which can serve as foundation for resource mobilization strategy and activities.

6. WMO Expected Result 6

Enhanced capabilities of Members in multi-hazard early warning and disaster prevention and preparedness

Regional ER 6(a): Upgrade in Members' capability in providing short-range forecast/warning, in disaster risk assessment and in contributing to disaster mitigation and sustainable development	
Deliverable:	
6.1	Focus efforts through the establishment/implementation of Disaster Risk Reduction Units in NMHSs
6.2	Involvement of NMHSs in publishing national disaster risk assessments
6.3	Nowcasting (0-6 hours ahead) service on high-impact weather
6.4	Dedicated units for forecasting high-impact weather conditions
6.5	Issuance of short-range forecasts/warnings (6-24 hours ahead)
6.6	Issuance of storm surge warnings
6.7	Operational storm surge model(s) runs
6.8	Provision of support for combating marine pollution
6.9	Provision of support for search and rescue operations
6.10	Involvement in national risk reduction planning and disaster management processes and activities
6.11	Implementation of instrumentation (e.g., DART) for real-time monitoring of storm surge or tsunami
6.12	Availability of an emergency (fully robust) delivery system of meteorological products for early warnings and for post disaster search and rescue operation
6.13	24/7 (24 hours, 7 days) production and dissemination of met-ocean numerical products
6.14	24/7 production and dissemination of basic and specialized NWP products under emergency situations
Regional ER6(b): Improved efforts of Members in outreach activities to users through public education and liaison with stakeholders	
Deliverable:	
6.15	Establish/strengthen links with national disaster managers
6.16	Develop/implement a public education programme
6.17	Involvement of NMHSs in introducing meteorology in school curriculum
6.18	Engagement of NMHSs in joint activities with national stakeholders
Regional ER6(c): Establishment of a region-wide multi-hazard early warning system, covering in particular hazards coming from the ocean as well as various airborne hazards	
Deliverable:	
6.19	Use of GIS platform to facilitate early warning, disaster prevention and preparedness
6.20	Participation in a region-wide multi-hazard early warning system
6.21	Providing early warning support for airborne hazards, in particular smoke from wildfires, volcanic emissions, chemical or biological spills, and nuclear accidents

7. Expected Result 7

Enhanced capabilities of Members to provide and use weather, climate, water and environmental applications and services

Regional ER7(a): Upgrade in Members' service delivery capability through enhanced legal basis, including cost recovery and by maintaining close liaison with academia, the media and private sector	
Deliverable:	
7.1	Establish/review legal basis for provision of services, including charging for services, as appropriate
7.2	Implementation/enhancement of cost recovery of services
7.3	Enhanced close cooperation with academia
7.4	Enhanced close cooperation with the media
7.5	Enhanced close cooperation with the private sector
Regional ER7(b): Sharing of experience on service delivery techniques among public weather, aviation, agriculture, river navigation and marine sectors	
Deliverable:	
7.6	Issuance of medium-range forecasts/warnings (1 day – 2 weeks ahead)
7.7	Operation of a website for real-time weather information, forecasts and warnings
Regional ER7(c): Enhancement in Members' aeronautical meteorological services including observations, information exchange and quality management	
Deliverable:	
7.8	Provision of improved aeronautical meteorological services
7.9	NMSs designation as Meteorological Authority
7.10	Full capability to make and transmit aerodrome meteorological observations
7.11	Issuance of TAF operationally
7.12	Issuance of SIGMET operationally
7.13	Provision of flight documentation to airlines
7.14	Implementation of cost recovery of aeronautical meteorological services
7.15	Implementation of a quality management system for the provision of aeronautical meteorological services meeting WMO Technical Regulations (Chapter C.3.1)/ICAO Annex 3 requirements
7.16	Implementation of WMO-No. 258 requirements for aeronautical meteorological personnel
Regional ER7(d): Improvement in Members' capability in marine meteorological services including forecasts and warnings	
Deliverable:	
7.17	Issuance of marine forecasts/warnings for coastal waters including sea state and wave/swell
7.18	Issuance of marine forecasts/warnings for high seas
Regional ER7(e): Improvement in Members' capability in agrometeorological services including information, forecasts and drought monitoring	
Deliverable:	
7.19	Provision of agrometeorological information and forecasts to users
7.20	Provision of agrometeorological services to the user community by promoting practical applications of technological advances in the agrometeorology domain
7.21	Regular publication of agrometeorological statistics and parameters for various users
7.22	Publication of meteorological products designed for livestock, fisheries and wild life
7.23	Monitoring and warning systems for drought
7.24	Early warning system for frost formation and heat waves
Regional ER7(f): Encouragement of Members to engage in socio-economic studies of the benefits of weather-, climate- and water-related services	
Deliverable:	
7.25	Cooperative efforts involving various stakeholders in undertaking and documenting socio-economic studies demonstrating the benefits of meteorological, climatological and hydrological infrastructure, information, products and services.

WMO Top-level Objective 3

To provide scientific and technical expertise and advice in support of policy and decision-making and implementation of the agreed international development goals and multilateral agreements

WMO Strategic Thrust 3
Partnership

The Region has already extensive experience in partnership. The weather, climate and water communities already have to work together to exchange needed data and products to enable the production and dissemination of needed forecasts and other services. Nonetheless, in view of the recognized need to appropriately respond to an ever-expanding set of user requirements, working together both within the Region and with other bodies outside the Region is a key strategic thrust for the Region. This is particularly underscored by the fact that the primary areas of concern to be addressed transcend boundaries – geographical, institutional and disciplinary. Partnership provides a good opportunity to optimize resources and capability in a synergistic manner. Within the Region, it would be desirable to strengthen partnership through region-wide organizations or sub-regional groupings overseeing the enhanced networking of meteorological observations, meteorological/environmental satellites, cooperation in NWP activities as well as in areas of research and applications. Inter-regional partnerships can be developed to also take advantage of experiences, expertise, infrastructure and other resources that can be shared. It is therefore important to take into account partnership in future initiatives or development projects.

In this connection, RA II will work towards:

- (i) Identifying strategic opportunities for regional and sub-regional cooperation and promoting potential bodies or other mechanisms for new partnerships;
- (ii) Developing innovative approaches and collaboration with new potential partners;
- (iii) Developing sub-regional framework to meet regional or sub-regional requirements with a view to optimizing development effort and resources;
- (iv) Promoting close cooperation among meteorological, hydrological and oceanographic services/institutions, where they are separated at the national level;
- (v) Promoting cooperation with other national stakeholders such as in other government institutions, economic sectors, academia and the media;
- (vi) Promoting enhanced regional cooperation involving international river basins;
- (vii) Improving the interaction with other sectors and disciplines including those in the social sciences, health authorities, development planning and disaster preparedness communities;
- (viii) Ensuring a fruitful dialogue with other WMO Regional Associations and with WMO Technical Commissions; and
- (ix) Securing the relevant participation of NMHSs in the operational implementation of research-funded projects.

8. WMO Expected Result 8

Broader use of weather, climate and water outputs for decision-making and implementation by Members and partner organizations

Regional ER8(a): Enhanced capability to develop proposals for sub-regional joint projects, including resource mobilization plan, in the areas of meteorological research, observations, satellites and NWP	
Deliverable:	
8.1	Enhanced services through improvement in the area of meteorological and hydrological research and/or observations for the Region (or sub-region)
8.2	Enhanced services through improvement in the area of satellite development/operation for the Region (or sub-region)
8.3	Numerical weather prediction (NWP) operational capability for the Region (or sub-region)
8.4	Exchange of weather radar images operationally over GTS/WIS, Internet or other means, with a view to producing a composite radar picture for the Region (or sub-region), to enhance public, aviation and marine safety
Regional ER8(b): Enhanced cooperation with other service providers in the provision of specific weather services or advice	
Deliverable:	
8.5	Collection and distribution of automated meteorological observations from aircraft, e.g., AMDAR and ADS data
8.6	Provision of location-specific weather services, e.g., alert of lightning or heavy rain (based on radar reflectivity) within a specified radius from the location, in association with information service providers to support decision-making by the public, people 'on the move' and weather-sensitive operations
8.7	Implementation of GIS platform combining meteorological and non-meteorological information (e.g., road/traffic conditions) to assist users
Regional ER8(c): Enhanced cooperation with other sectors (such as social sciences, health, planning and disaster preparedness) in the provision of specific weather services or advice	
Deliverable:	
8.8	Regional exchange of information on research related to interaction between weather/climate and health
8.9	Health-related studies in association with partner organizations (in areas such as urban micro-climate studies in respect of respiratory diseases, and bio-climate studies in respect of diseases such as Dengue Fever and avian flu)
8.10	Development of resource mobilization plan to access funding by NMHSs from development partners or from stakeholders for the provision of specific services
8.11	Interdisciplinary partnership for undertaking socio-economic benefits studies as foundation for resource mobilization efforts
8.12	Members' capability in facilitating the use of agrometeorological information for enhancing animal health and reducing animal exposure to diseases

WMO Top-level Objective 3

To provide scientific and technical expertise and advice in support of policy and decision-making and implementation of the agreed international development goals and multilateral agreements

Strategic Thrust 4

Capacity-building

Capacity building is an important area to focus on as many developing countries and least developed countries in the Region face significant challenges in providing even basic weather-, climate- and water-related services. The capability within the Region is not homogeneous and not all Members can contribute as effectively as they would like to the safety and well-being of people, sustainable development and environmental protection; nor are they also able to more fully benefit from pertinent services that may be available elsewhere. This situation is exacerbated by the increasing demand for more comprehensive services across the Region. There is a need to build capacity so that the whole Region can effectively utilize the expertise and resources available as equitably as possible. This can be done, among others, by capitalizing on the training provided by WMO and Members' training centres, RSMCs and programmes carried out by consortia. This can help to address the technological gaps that exist. Technology transfer can be facilitated through the sub-regional networks, and other multilateral collaborations including the sharing of best practices. And these capacity building efforts could involve partners across geographical, institutional or disciplinary frontiers. It is important to view capacity building as a strategic imperative and part of an overall strategic development plan at the regional, subregional and national levels. Hence, capacity building is not to be limited to scientific and technological concerns, but also strategic, developmental and management consideration including human resources development, resource mobilization and communications plans.

In this connection, RA II will work towards:

- (i) Assessing and addressing the gaps in knowledge and capabilities to ensure an appropriate level of services, especially in observation infrastructure design, operation and sustainability;
- (ii) Evolving an appropriate strategic approach to enable the best use of the Region's existing capabilities and to develop new ones where appropriate to achieve RA II objectives;
- (iii) Setting up the appropriate collective actions/projects to meet identified needs;
- (iv) Ensuring that the Region and its NMHSs have the right people with the right skills to achieve their objectives; and
- (v) Sharing experience and best practices from and with other WMO constituent bodies.

9. WMO Expected Result 9

Enhanced capabilities of NMHSs in developing countries, particularly least developed countries, to fulfill their mandates

Regional ER9(a): Development of a strategic approach to capacity building for use at national level but with a regional perspective	
Deliverable:	
9.1	Outline (or template) to enable the formulation of capacity assessment and development plan as part of a national (overall) strategic plan for the enhanced provision of weather, climate and water services
Regional ER9(a): Maintaining a structured training programme for professional, technical and supporting staff and in assisting its staff in acquiring the necessary qualification to improve services	
Deliverable:	
9.2	Maintenance of highly-qualified staff with specialized training in NMHSs
9.3	Maintenance/implementation of a structured training plan for professional, technical and supporting staff
9.4	Access and use of e-learning materials
9.5	Professional certification of staff in respect of WMO's latest personnel classification scheme
9.6	Continuous education programmes and refresher courses for staff
9.7	Management training (including strategic planning) for mid- and high-level personnel
9.8	Migration from Category I (below 3 days) to Category II (3-6 days) and Category III (over 6 days) range of public weather forecasts
9.9	Operation of an automatic telephone answering system for weather information, forecasts and warnings
9.10	Operation of a television weather programme
9.11	Nowcasting and very short-range forecasting for aerodromes
9.12	Operation and update of a Website for the delivery and display of their services and products
9.13	Rescue and digitizing climate records
Regional ER9(b): Enhancement in Members' capability in self-monitoring through user feedback, public surveys and verification of their own products	
Deliverable:	
9.14	Verification of the accuracy of public forecasts
9.15	Feedback from the public through opinion surveys, user groups, etc.
9.16	Verification of aviation forecasts (including TAF) and warnings using a WMO-approved set of methods
9.17	Feedback from aviation users through opinion surveys, user groups, etc.
9.18	Feedback from marine users through opinion surveys, user groups, etc.
Regional ER9(c): Members to conduct public education programmes to outreach to the public and user community	
Deliverable:	
9.19	Public education programme for users on the availability and use of marine meteorological and oceanographic information, forecasts and warnings
9.20	Public education programme regarding water-related information, including hazards, hydrological forecasts and warnings
9.21	Public education programme regarding climate-related information, including climate change and variability, and associated adaptation and mitigation issues
Regional ER9(d): Members to take part in WMO's global weather information services as well as pilot projects in RA II	
Deliverable:	
9.22	Contributing operational weather information to WMO's on-line World Weather Information Service (WWIS)
9.23	Support to exchange of official warnings of severe weather by contributing to WMO's on-line Severe Weather Information Centre (SWIC)
9.24	(RA II Pilot Project) Enhanced use of and participation in city-specific NWP products provided to developing countries via Internet
9.25	(RA II Pilot Project) Enhanced use of and participation in the support provided to developing countries in Aeronautical Meteorology Programme

WMO Top-level Objective 3

To provide scientific and technical expertise and advice in support of policy and decision-making and implementation of the agreed international development goals and multilateral agreements

WMO Strategic Thrust 5

Efficient Management and Good Governance

Appropriate management and governance are essential in ensuring the realization of an entity's vision, goals and objectives with the full interactive and iterative participation of the concerned stakeholders as well as in making the most cost-effective use of the available resources. A strategic approach to the needed development in the Region will be desirable to define a clear direction. These considerations are important for the Region to meet the priorities as articulated by Members and to effectively manage resources available to it including those provided out of good will such as contribution of volunteers from its Members to conduct many of its activities.

In this connection, RA II will work towards:

- (i) Further development of its Strategic Plan, assessment of its implementation including reviewing subsidiary bodies of RA II and their role in delivering the Strategic Plan's objectives;
- (ii) Ensuring continuing interaction within RA II to ascertain evolving needs, trends and developments with a view to promoting common approaches to address identified priority areas of concern;
- (iii) Liaising with WMO Secretariat to assist in the further development of RA II's expertise and capabilities as well as in promoting the use of such by other entities in the Region and elsewhere;
- (iv) Collaborating, sharing experience, knowledge and capabilities with other Regions to help deliver the WMO Strategic Plan objectives; and
- (v) Enhanced networking with Members, relevant institutions and bodies with a view to pooling the Region's expertise and capabilities to better meet users' requirements.

10. WMO Expected Result 10

Effective and efficient functioning of constituent bodies

<i>Regional ER10(a): Improved RA II decision making and coordination</i>	
Deliverable:	
10.1	Authority to the president of RA II to make decisions on behalf of RA II, in consultation with Management Group so as to have more dynamic response and decision-making not limited to time of sessions
<i>Regional ER10(b): Effective monitoring of the RA II Action Plan</i>	
Deliverable:	
10.2	Effectiveness in RA II's monitoring of the Action Plan
<i>Regional ER10(c): Review of the subsidiary working groups of RA II</i>	
Deliverable:	
10.3	Effective re-organization of RA II subsidiary working groups
<i>Regional ER10(d): Gauging Members' level of satisfaction with RA II work through the yearly survey</i>	
Deliverable:	
10.4	Effectiveness in the service and support provided to Members in light of the RA II's alignment with WMO's result-based management approach

11. WMO Expected Result 11

Effective and efficient management performance and oversight of the Organization

<i>Regional ER11(a): Improved strategic planning process as well as monitoring and evaluation</i>	
Deliverable:	
11.1	Documented regional strategic planning process with its linkage to the WMO process and the national processes, taking into account also the needed monitoring and evaluation of the WMO, regional and national plans
<i>Regional ER11(b): Increased influence of RA II constituent bodies in regional related matters</i>	
Deliverable:	
11.2	Increased influence of RA II constituent bodies in regional matters
<i>Regional ER11(c): Intensified and easier access to common resources via electronic means</i>	
Deliverable: Development of a resource mobilization strategy and database	
11.3	Improvement in access to WMO's common resources via electronic means
<i>Regional ER11(d): Enhanced RA II hydrological activities; networking of Members for contribution to regional initiatives related to water</i>	
Deliverable:	
11.4	Enhancement in RA II hydrological activities