

WMO OPERATING PLAN

2016–2019

WEATHER · CLIMATE · WATER



WORLD
METEOROLOGICAL
ORGANIZATION

OCTOBER 2016 VERSION

WMO OPERATING PLAN 2016-2019

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EXECUTIVE SUMMARY

The WMO Operating Plan (OP) for the period 2016-2019 is developed using a results-based approach in planning programme activities and projects to achieve Expected Results in line with decisions of the Congress and Executive Council. It is based on the draft WMO Strategic Plan for the period 2016-2019 and lists time-bound programme activities and projects planned for implementation by the technical commissions (TCs), regional associations (RAs) and the Secretariat to achieve the vision and mission of the Organization. It forms the basis for the WMO budget for the seventeenth financial period, and the WMO Monitoring and Evaluation System (M&E).

The OP is organized by Expected Results and focuses on priorities defined in the Strategic Plan. It comprises the planned programme activities and projects to achieve Expected Results. It also presents timelines, allocated resources, Key Performance Indicators and other details on each activity. Areas of focus in the planning of programme activities and projects are presented in the Annex.

The OP is a living document that will be updated regularly to include any adjustments as required.

INTRODUCTION

PURPOSE OF THE WMO OPERATING PLAN AND LINKAGE TO THE STRATEGIC PLAN AND RESULTS-BASED BUDGET

An operating plan represents an action stage in the strategic planning and implementation process. The WMO Operating Plan (OP) is one of the components of the WMO strategic planning process and Results-based Management Framework (RBM) (Figure 1) and guides the implementation of programme activities aimed at achieving the Expected Results (Table 1) to realize the mission of the Organization as presented in the WMO Strategic Plan (SP) for the period 2016-2019. The OP presents time-bound programme activities and projects to be implemented to achieve Expected Results and the associated Key Outcomes and deliverables. The Operating Plan provides the foundation for WMO Results-based Budget (RBB), which identifies regular resources to implement programme activities and projects in the OP, as well as voluntary resources for project initiatives that contribute to the achievement of the Expected Results.

The OP is also an essential element in the implementation of the WMO Monitoring and Evaluation (M&E) System, which is the other component of the WMO strategic planning process and RBM.

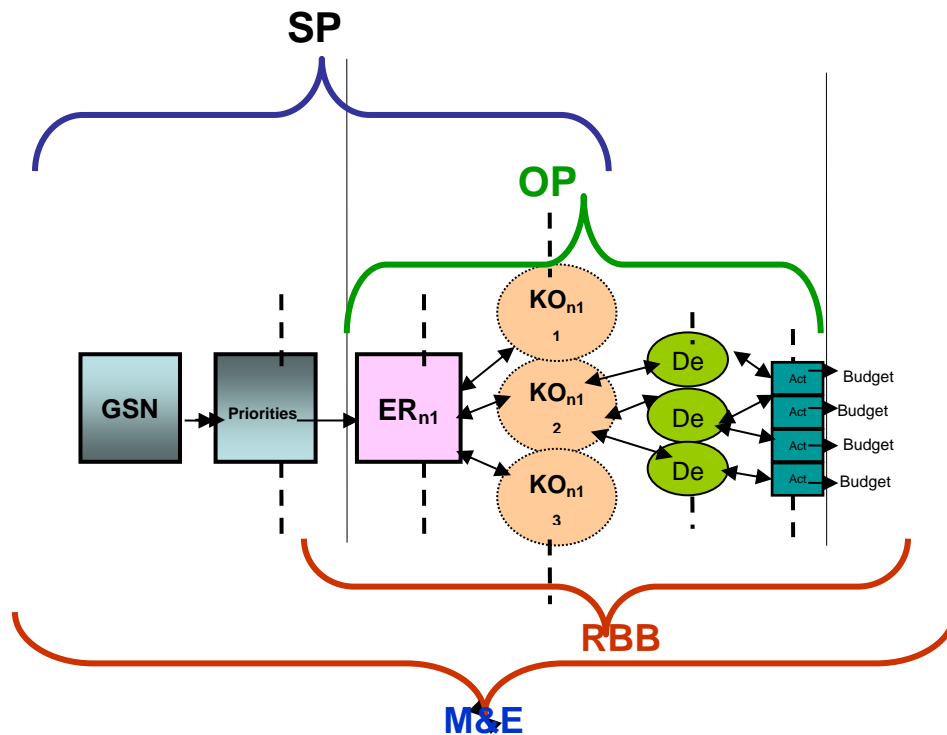


Figure 1: Schematic representation of WMO Strategic Planning process and Results-based Management Frameworks showing linkage in the components (SP, OP, RBB and M&E).

Table 1: Schematic representation of the structure and scope of the WMO Strategic Plan

Global Societal Needs	Priorities	Expected Results
<p>Improved protection of life and property</p> <p>End poverty, ensure sustainable resilient livelihoods, food security, sustainable access to water and energy, healthy lives, gender equality and economic growth, and combat climate change</p> <p>Sustainable use of natural resources and improved environmental quality</p>	Disaster Risk Reduction	<p>1 Improved service quality and service delivery</p> <p><i>Enhanced capabilities of Members to deliver and improve access to high-quality weather, climate, hydrological and related environmental predictions, information, warnings and services in response to users' needs and to enable their use in decision-making by relevant societal sectors</i></p>
	Global Framework for Climate Services	<p>2 Reduced Disaster Risk</p> <p><i>Enhanced capabilities of Members to reduce risks and potential impacts of hazards caused by weather, climate, water and related environmental elements</i></p>
	WMO Integrated Global Observing System	<p>3 Improved Data-Processing, Modelling and Forecasting</p> <p><i>Enhanced capabilities of Members to produce better weather, climate, water and related environmental information, predictions and warnings to support, in particular, reduced disaster risk and climate impact and adaptation strategies</i></p>
	Aviation meteorological services	<p>4 Improved Observations and Data Exchange</p> <p><i>Enhanced capabilities of Members to access, develop, implement and use integrated and interoperable Earth- and space-based observation systems for weather, climate and hydrological observations, as well as related environmental and space weather observations, based on world standards set by WMO</i></p>
	Polar and high-mountain regions monitoring, prediction and services	<p>5 Advance Targeted Research</p> <p><i>Enhanced capabilities of Members to contribute to and draw benefits from the global research capacity for weather, climate, water and the related environmental science and technology development</i></p>
	Capacity development	<p>6 Strengthened Capacity Development</p> <p><i>Enhanced capabilities of Members' NMHSs, in particular in developing and least developed countries and Small Island Developing States, to fulfil their mandates</i></p>
	WMO governance	<p>7 Strengthened Partnerships</p> <p><i>New and strengthened partnerships and cooperation activities to improve NMHSs' performance in delivering services and to demonstrate the value of WMO contributions within the United Nations system, relevant regional organizations, international conventions and national strategies</i></p>

Specific elements of the OP are:

- **Expected Results and the associated Key Outcomes and Key Performance Indicators** to measure the progress in the achievement of Expected Results (Table 2); and
- **The programme activities planned for implementation and the associated deliverables and costs.**

The SP and OP provide the foundation for effective use of resources. These are the products of a WMO integrated planning process in which the Secretariat, working with Members, regional associations and technical commissions, identifies very specific activities and initiatives that need to be implemented to achieve Expected Results and the resources required to meet them. The end state is a four-year Results-based Budget, which is linked to the WMO Strategic Plan. The planning process ensures the linkage among the components of the strategic planning process and RBM, namely the SP, OP, RBB and M&E (Figure 1) to enable efficient and effective implementation of the Strategic Plan to achieve the ERs. The risks that may influence the achievement of ERs and actions to mitigate them are presented in Table 3.

Table 2: Expected Results, Key Outcomes and Key Performance Indicators

<i>Expected Result 1: (Improved service quality and service delivery) - Enhanced capabilities of Members to deliver and improve access to high-quality weather, climate, hydrological and related environmental predictions, information, warnings and services in response to users' needs and to enable their use in decision-making by relevant societal sectors</i>			
KO 1.1	Improved access to seamless weather, climate, water, and related environmental products and services (e.g. warnings, forecasts and supporting information)	KPI 1.1.1	Number of Members demonstrating quantitative measurements of the socio-economic benefits of their products and services
		KPI 1.1.2	Percentage of NMHSs with regular access to products provided by global and regional centres
KO 1.2	Delivery of weather, climate, water and related environmental products and services to users' communities is improved	KPI 1.2.1	Number of NMHSs expressing user satisfaction with the (a) availability, (b) reliability (c) range of products timeliness and (e) contribution to decision making

Expected Result 2: (Reduced Disaster Risk) - Enhanced capabilities of Members to reduce risks and potential impacts of hazards caused by weather, climate, water and related environmental elements

KO 2.1	Multi-hazard early warning systems are implemented	KPI 2.1.1	Number of NMHSs contributing to the implementation of multi-hazard early warning systems
KO 2.2	National integrated flood management plans are developed	KPI 2.2.1	Number of Members establishing flood management plans
		KPI 2.2.2	Number of NMHSs participating in regional hydrological forecasting systems for transboundary river basins
KO 2.3	Drought early warning systems are improved	KPI 2.3.1	NMHSs and Regional Centres that issue drought early warnings

Expected Result 3: (Improved Data-Processing, Modelling and Forecasting) - Enhanced capabilities of Members to produce better weather, climate, water and related environmental information, predictions and warnings to support ,in particular, reduced disaster risk and climate impact and adaptation strategies

KO 3.1	Improved climate monitoring, long range forecasts and long-term projections	KPI 3.1.1	Number of Members issuing: (a) monthly predictions; (b) seasonal predictions; (c) climate watch bulletins; and (d) long-term projections
		KPI 3.1.2	Perceived quality of the issued: (a) monthly predictions; (b) seasonal predictions; (c) climate watch bulletins; and (d) long-term projections
		KPI 3.1.3	Perceived timeliness of the issued: (a) monthly predictions; (b) seasonal predictions; (c) climate watch bulletins; and (d) long-term projections
KO 3.2	Climate information and prediction products for climate adaptation and risk management are improved	KPI 3.2.1	Perceived quality of the products of WMO Regional Climate Centres used at the national level
		KPI 3.2.2	Number of Members operationally developing and disseminating climate products and information for national needs
		KPI 3.2.3	Perceived quality of the national climate information and products available in Member countries
		KPI 3.2.4	Number of Members providing targeted/ tailored climate information, products and services, through formal

			mechanisms including National Climate Outlook Forums, to support user requirements in their countries for adaptation and climate risk management in key socio-economic sectors
KO 3.3	Hydrological information and products, including water resources, are improved	KPI 3.3.1	Number of Members using a Quality Management Framework for Hydrology based on current guidance materials
		KPI 3.3.2	Number of regional hydrological databases developed in transboundary river basins
KO 3.4	Drought information and prediction for risk management is improved	KPI 3.4.1	NMHSs and Regional Centres issuing drought information and prediction

Expected Result 4: (Improved Observations and Data Exchange) - Enhanced capabilities of Members to access, develop, implement and use integrated and interoperable Earth- and space-based observation systems for weather, climate and hydrological observations, as well as related environmental and space weather observations, based on world standards set by WMO

KO 4.1	WMO Integrated Global Observing System implementation phase is completed	KPI 4.1.1	Percentage of progress in achieving the key implementation tasks, milestones and deliverables specified by the WIGOS Implementation Plan (WIP)
		KPI 4.1.2	Increased availability of observations for users (as measured by several ratios)
		KPI 4.1.3	Number of partner organizations involved in WIGOS implementation
KO 4.2	WMO information System is developed and implemented	KPI 4.2.1	Progress in the implementation of WIS by NMHSs as measured by: (a) percentage of registered WIS centres that have been endorsed as WIS compliant; (b) Number of NMHSs with improved observational data as a result of implementation of WIS functions; and (c) Number of NMHSs with improved products as a result of implementation of WIS functions
		KPI 4.2.2	Number of NMHSs whose data processing and management capabilities have enhanced as a result of

			implementation of WIS functions
KO 4.3	Progress in implementing the Global Climate Observing System	KPI 4.3.1	Percentage of progress in achieving the GCOS implementation plan
KO 4.4	Data rescue and data management systems improved	KPI 4.4.1	Number of NMHSs undertaking data rescue or being involved in regional collaborative data rescue initiatives such as MEDARE
		KPI 4.4.2	Number of Members implementing modern climate data management systems and/or climate monitoring systems

Expected Result 5: (Advance Targeted Research) - Enhanced capabilities of Members to contribute to and draw benefits from the global research capacity for weather, climate, water and the related environmental science and technology development

KO 5.1	Research in climate prediction/projection to improve the skills of seasonal, decadal and longer timescales is enhanced	KPI 5.1.1	Number of new activities advancing climate research capacity at the global and regional level, especially for early career scientists and scientists from developing and LDC countries
		KPI 5.1.2	Number of early career scientists and scientists from developing and least developed countries that WCRP funded to participate in activities to advance climate research
		KPI 5.1.3	Degree of satisfaction among NMHSs with the skill of climate predictions
KO 5.2	Research in the prediction of high-impact weather on time scales of hours to seasons is enhanced	KPI 5.2.1	Number of total research projects (new, ongoing and completed) on operational products and services
		KPI 5.2.2	Number of Members whose operational products and services have improved as a result of WMO research projects
		KPI 5.2.3	Number of NMHSs in developing and least developed countries participating in regional and international research initiatives on high impact weather or severe weather forecasting demonstration projects
KO 5.3	Atmospheric chemistry observations and assessment meet needs of environmental conventions	KPI 5.3.1	Degree of Member satisfaction with the: (a) usefulness and (b) timeliness of Global Atmospheric Chemistry Bulletins

	and policy assessments	KPI 5.3.2	Degree of Member satisfaction with the usefulness of: (a) GAW measurement guidelines and reports; (b) Sand-and-Dust storm products; and (c) the chemical weather activities of GURME

Expected Result 6: (Strengthened Capacity Development) - Enhanced capabilities of Members' NMHSs, in particular in developing and least developed countries and Small Island Developing States, to fulfil their mandates.

KO 6.1	Visibility and relevance of NMHSs in national and regional development agendas is improved, particularly in developing and least developed countries	KPI 6.1.1	Number of NMHSs with: (a) increased contribution to national policy setting; (b) improved awareness by users on types of services NMHSs can deliver; (c) improved user accessibility to forecasts and warnings; (d) improved timeliness of forecasts and warnings; and (e) increased accuracy of forecasts and warnings
		KPI 6.1.2	Number of NMHSs with: (a) increased contribution to regional policy setting; (b) improved awareness by regional users on types of services that can be provided by the centre; (c) improved regional user accessibility to forecasts and warnings; (d) improved timeliness of forecasts and warnings delivered from the Regional Centre; and (e) increased accuracy of forecasts and warnings delivered from the Regional Centre
KO 6.2	Infrastructure and operational facilities of NMHSs and Regional Centres are improved, particularly in developing and least developed countries	KPI 6.2.1	Number of NMHSs with improved infrastructure and operational facilities
KO 6.3	Education and training development facilities at national and regional levels are improved, especially in developing and least developed countries	KPI 6.3.1	Number of Regional Training Centres (RTCs) providing education and training support for GFCS-related activities
		KPI 6.3.2	Degree to which Members are getting value for money from the WMO Fellowship Programme
		KPI 6.3.3	Degree of Member satisfaction with the RTCs in use
KO 6.4	Capacities of NMHSs are enhanced through cooperation and partnerships with other national and regional	KPI 6.4.1	Development projects and activities funded through voluntary and extra-budgetary resources

	organizations		
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Expected Result 7: (Strengthened Partnerships) - New and strengthened partnerships and cooperation activities to improve NMHSs' performance in delivering services and to demonstrate the value of WMO contributions within the United Nations system, relevant regional organizations, international conventions and national strategies.

KO 7.1	WMO leadership and contribution in relevant UN system and other international partners' initiatives and programmes is improved	KPI 7.1.1	Number of reports of WMO and its co-sponsored programmes submitted to UN and other international conventions, particularly the UNFCCC, UNCCD and UNCBD
		KPI 7.1.2	Number of contracts/cooperation agreements within which WMO is engaged with partners
		KPI 7.1.3	Number of NMHSs implementing projects with the UN and other international and/or regional organizations
KO 7.2	Public, decision-makers and other stakeholders are increasingly aware of key WMO and NMHSs issues, activities and priorities through enhanced communication	KPI 7.2.1	Uptake of WMO public information outputs as measured by: (a) number of unique visitors on the WMO website; (b) number of times WMO was mentioned in press articles; (c) number of Facebook fans; and (d) number of Twitter followers
		KPI 7.2.2	Degree to which NMHSs make use of WMO public information outputs
		KPI 7.2.3	Number of NMHSs that have provided training to senior managers and/or communication officers in media relations, social media or other aspects of communication

Expected Result 8: (Improved Efficiency and Effectiveness): Ensured effective functioning of policy-making and constituent bodies and oversight of the Organization.

KO 8.1	Effective and efficient WMO Congress and EC	KPI 8.1.1	Degree of Member satisfaction with documentation for Cg, EC and its working groups
		KPI 8.1.2	Degree of Member satisfaction with supporting services for Cg and EC
		KPI 8.1.3	Decrease in the total cost of sessions held under similar conditions
KO 8.2	An effective and efficient WMO Secretariat	KPI 8.2.1	Percentage of implemented accepted oversight recommendations for improved business effectiveness on the agreed deadline
		KPI 8.2.2	Unqualified opinion of the external auditor in the financial period
		KPI 8.2.3	Increase in the efficiency of fulfilling requirements for linguistic and publishing services
		KPI 8.2.4	Issuance of statements of internal control in the financial period
KO 8.3	Effective and efficient constituent bodies (RAs and TCs)	KPI 8.3.1	Degree of Member satisfaction with constituent body documentation
		KPI 8.3.2	Degree of Member satisfaction with constituent body supporting services
		KPI 8.3.3	Decrease in the total cost of constituent body sessions held under similar conditions
KO 8.4	Gender equality across WMO	KPI 8.4.1	Proportion of men/women in WMO constituent bodies
		KPI 8.4.2	Number of men/women granted WMO fellowship/number of total candidates

Table 3: Risks that may influence the achievement of expected results and actions to mitigate them.

Expected Results	Risk	Mitigation
<p>ER 1: (Improved service quality and service delivery): Enhanced capabilities of Members to deliver and improve access to high-quality weather, climate, hydrological and related environmental predictions, information, warnings and services in response to users’ needs and to enable their use in decision-making by relevant societal sectors</p>	<p>Lack of improvement in the availability of surface or space-based observations, production and dissemination systems essential for the provision of services.</p> <p>Members non-compliance with WMO and ICAO QMS and competencies standards, particularly those related to quality management, would compromise the quality of services and the role of NMHSs reducing the credibility of WMO and its Member’s NMHSs resulting to inability of NMHSs to service civil aviation, compete with other service providers and raise revenue from cost recovery.</p>	<p>WHYCOS initiative and HYCOS components. Linkage with GCOS. Continuous dialogue with those working in the space-based observation systems from a climate and hydrology perspective. QMF approach to service development and delivery through CCI, CAgM and CHy. Contribution to GFCS.</p> <p>Actions identified in the Operating Plan; Requirements reflected in deliverables and expected outcomes; Monitoring and coordination.</p> <p>Promote culture of compliance. Identify and fix deficiencies. Proactively develop standards and recommended practices for the delivery of other services. Develop adequate implementation guidance. Promote bilateral cooperation through “twinning” or “coaching”. Promote the sharing of experiences among NMHSs. Focused training on service delivery. Establish SD pilot projects.</p>
<p>ER 2: (Reduced Disaster Risk) Enhanced capabilities of Members to reduce risks and potential impacts of hazards caused by weather, climate, water and related environmental elements</p>	<p>The ICAO Aviation System Block Upgrades (ASBU) for Air Traffic Management (ATM) will lead to significant mid-to-long-term changes and impacts in the mode of aeronautical meteorological service delivery to a time horizon of 2028 and beyond and pose strong requirements to Members to adapt to the new models of service provision and compliance with new regulations and institutional arrangements resulting in stronger competition between service providers (including private entities) with potential impact on the role of NMHSs in serving international air navigation and negative effects on their overall mandate and the possibility to recover the cost for the aviation</p>	<p>Close collaboration with ICAO to contribute to development of new systems, services and regulatory frameworks. Participate in the development of adequate cost-recovery mechanisms for multi-national service provision models. Undertake systematic measures to ensure competitiveness of the NMHSs as aviation service providers. Facilitate fast uptake of science and technology achievements into operational practice in order to respond to the user demands.</p> <p>Establishment of RCCs, RCOFs and RTCC (Climate). CCI and CAgM training initiatives. Establishment of COMET – Hydrology courses on-line. Assistance to RTCs (Hydrology) in training courses. Training strategy for HWR. Training components of extrabudgetary funded projects.</p>

Expected Results	Risk	Mitigation
	<p>meteorological services.</p> <p>The weakness in succession planning, an aging workforce, loss of skilled personnel due to natural attrition coupled with inadequate resources to enhance human capacities and infrastructure of the NMHS.</p>	<p>Implementing an integrated approach, including modernization, operational development, on-the-job training, etc. crossing all levels (international, regional and national), all disciplines (weather, climate, water, and environment related), and all major communities (the General Public, Transportation, Health, Agriculture & Food Security, DRR, Energy, Urban Sustainability etc.).</p>
<p>ER 3: (Improved Data-Processing, Modelling and Forecasting) Enhanced capabilities of Members to produce better weather, climate, water and related environmental information, predictions and warnings to support, in particular, reduced disaster risk and climate impact and adaptation strategies</p> <p>ER 4: (Improved Observations and Data Exchange: Enhanced capabilities of Members to access, develop, implement and use integrated and interoperable Earth- and space-based observation systems for weather, climate and hydrological observations, as well as related environmental and space weather observations, based on world standards set by WMO</p> <p>ER 5: (Advance Targeted Research) Enhanced capabilities of Members to contribute to and draw benefits from the global research capacity for weather, climate, water and related environmental science and technology</p>	<p>Inadequate resources to modernize optimize and sustain global observing systems, the underlying data processing, data management and high performance computing capacity.</p>	<p>Align the global research effort to the major needs of Members Demonstrate the benefits of the investments in the global research effort and observation networks aimed towards integrated, enhance and new services.</p> <p>Training to develop human resources capable of improving methods and efficiency of observing, processing and computing.</p> <p>WIGOS is creating a framework that will enable Members to gain synergies with other organizations to improve observing systems and their coverage at national, regional and global levels. WIS is enabling better access to and sharing of data and products across all programmes.</p>

Expected Results	Risk	Mitigation
development		
ER 6: (Strengthened Capacity Development) Enhanced capabilities of Members' NMHSs, in particular in developing and least developed countries and Small Island Developing States, to fulfil their mandates	Inadequate budgetary provisions to NMHS to implement and build capacity to operate essential infrastructure and provide services.	<p>WMO assistance as identified in the WMO Capacity Development Strategy.</p> <p>QMF approach and guidance on management of climate and hydrological services. HYCOS Components. Contribution to GFCS.</p> <p>Building a targeted partnership (including cascading process) between advanced and least developed through effective integrated efforts provided by WMO Programmes, projects, and activities for CD.</p>
	The capacity of the WMO and its Members' NMHSs to mobilize and effectively utilize resources from funding agencies to invest in weather, water and climate infrastructure and human resources.	<p>WMO assistance as identified in the WMO Capacity Development Strategy especially in resource mobilization. Working closely with donors and delivering on funded projects. Preparation of project proposals with Member country input.</p> <p>Both WIGOS and WIS are providing clearly defined competencies and learning guides that will allow Members to ensure their staff have the required skills and to assist WMO training activities to ensure they are developing the necessary competencies in staff. WIGOS framework and WIS also address the budgetary and resource mobilization issues including providing clear standards and practices that can be used in specifying capacity building projects.</p> <p>Assist NMHSs to develop business plans consistent with WMO technical regulations and national requirements.</p>
ER 7: (Strengthened Partnerships) New and strengthened partnerships and cooperation activities to improve NMHSs' performance in delivering services and to demonstrate the value of WMO contributions within	By missing opportunities to engage partners actively, there will be limitations in establishing institutional linkages needed for the implementation of DRR, GFCS, WIGOS and Research activities, together with sourcing additional funding to support	<p>Identifying the key partnerships to enter into. Attending selected research/ academic community meetings. Keeping contact with relevant TC members and Management Group members to identify new advances. Contribution to GFCS.</p> <p>Active systematic monitoring of</p>

Expected Results	Risk	Mitigation
the United Nations system, relevant regional organizations, international conventions and national strategies	shared initiatives and ability to engage users to develop and use user-oriented services.	<p>existing and future agreements. Full implementation of the Communication strategy.</p> <p>Make maximal use of opportunities. Leverage available funding.</p> <p>Under each priority areas should be developed to monitor the performance in the effort of partnership for each TCs, RAs, and the Secretariat.</p>
ER 8: (Improved Efficiency and Effectiveness) Ensured effective functioning of policy-making and constituent bodies and oversight of the Organization	Weaknesses in system of internal control that may compromise the reputation of the Organization.	Regular reviews of the system of internal control, including where necessary participation of external parties.
	Interrupting operations at Secretariat and field offices.	Actions identified in the Business Continuity Plan.
	Resources to sustain multilingual conference and publishing services.	Actions listed in the Risk Register and introduction in LCP of efficiency oriented new practices; updated Standing Instructions (Ch. 2, 3); respect schedule of constituent sessions as approved by Congress.

**II. PROGRAMME ACTIVITIES PLANNED AND FUNDED FOR IMPLEMENTATION
IN 2016-2019**

(in Swiss Francs)

TO BE INCLUDED WHEN FINALIZED

III. TECHNICAL COMMISSIONS OPERATING PLANS

III.1 COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION (CIMO) OPERATING PLAN 2016-2019

ER	Key Outcome	Deliverable	Programme	Technical Commission	Activity	Y2016	Y2017	Y2018	Y2019	Total
4	4.1	Report of SPICE Intercomparison	IMOP	CIMO	Intercomparison – SPICE	X				
4	4.1	Report of IPC-XII - Traceability of ref. pyrheliometers	IMOP	CIMO	Intercomparison - IPC-XII	X				
4	4.1	Report of infrared radiometer intercomparison	IMOP	CIMO	Intercomparison of infrared radiometers	X				
4	4.1	Detailed plan for Intercomparison	IMOP	CIMO	Intercomparison feasibility study	X	X			
4	4.1	Report of Intercomparison	IMOP	CIMO	Intercomparison		X	X	X	
4	4.1	Reports on Completed Instrument Tests	IMOP	CIMO	Testbeds	X	X	X	X	
4	4.1	IOM Reports	IMOP	CIMO	Capacity Building					
4	4.1	Conference on Instruments & Methods of Obs.	IMOP	CIMO	TECO-2016 (Capacity building)	X				
4	4.1	Instrument Exhibition (METEOREX-2016)	IMOP	CIMO	METEOREX-2016	X				
4	4.1	Conference on Instruments & Methods of Obs.	IMOP	CIMO	TECO-2018 (Capacity building)			X		
4	4.1	Instrument Exhibition (METEOREX-2018)	IMOP	CIMO	METEOREX-2018			X		
4	4.1	Workshop on instrumentation (challenges faced in mountain stations or AWS)	IMOP	CIMO	Workshop (Capacity Building)		X			
4	4.1	New web-based edition of ICA	IMOP	CIMO	Update of the International Cloud Atlas	X				

Note: This Operating Plan comes as a complement to the activities already listed in the Secretariat Operating Plan relevant to CIMO.

III.2 COMMISSION FOR HYDROLOGY (CHY) OPERATING PLAN 2016-2019

Expected Result 1									
Enhanced capabilities of Members to deliver and improve access to high-quality weather, climate, water and related environmental predictions, information, warnings and services in response to users' needs, and to enable their use in decision-making by relevant societal sectors.									
Key Outcome 1.1		Improved access to seamless weather, climate and water and related environmental products and services (e.g. warnings, forecasts and supporting information)						Source of funding	
Key Performance Indicators		<ul style="list-style-type: none"> Analyses showing the social and economic benefits of the improved services NMHS with regular access to products provided by global and regional centres 							
Activities	Deliverables	Programme	TC	2016	2017	2018	2019		
Update guidance on the application of the seamless prediction capabilities for delivery of water-related products (e.g. forecasts and warnings)	Guide and Manuals which are state-of-the-art	Hydrological Forecasting and Prediction	CHy	X	X	X	X	In-kind contributions and support from Secretariat	
Review and evaluate the advances in Numerical Weather Prediction (NWP) with respect to improved flood forecasting and warning services (e.g. through case studies)	Improved flood forecasting and warning services.	Hydrological Forecasting and Prediction	CHy	X	X	X	X	In-kind contributions and support from Secretariat and extrabudgetary funds for target areas	

Expected Result 2

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

Key Outcome 2.1 Multi-hazard warning systems are implemented								Source of funding
Key Performance Indicators								
<ul style="list-style-type: none"> Increase in the number of NMHSs with multi-hazard warning systems Number of NMHSs integrated into national emergency management systems Developing country Members providing disaster risk reduction products and services 								
Activities	Deliverables	Programme	TC	2016	2017	2018	2019	
Provide advice and support to the projects related to the Flash Flood Guidance System (FFGS) and PROHIMET taking account of other initiatives in the area	Informed decisions associated with CHy related flood activities (namely FFGS and PROHIMET)	Hydrological Forecasting and Prediction	CHy	X	X	X	X	In-kind contributions and support from Secretariat and extrabudgetary funds for target areas
Review and evaluate the developments associated with the Global Flood Alert System	Informed decisions associated with CHy related flood activities (namely GFAS)	Hydrological Forecasting and Prediction	CHy	X	X	X	X	In-kind contributions and support from Secretariat
Provide guidance and advice on the use of hydrological models in collaboration with other related hazards, such as storm surges, cyclones, etc.	Improved multi-hazard warning capabilities of NMHSs	Hydrological Forecasting and Prediction	CHy	X	X	X	X	In-kind contributions and support from Secretariat and extrabudgetary funds for target areas
Review and revise the Strategy and Action Plan on the Flood Forecasting Initiative in line with recommendations from the FFI Advisory Group and evolving Member needs.	Refined and improved Strategy and Action plan for flood forecasting	Hydrological Forecasting and Prediction	CHy	X	X	X	X	In-kind contributions and support from
Prepare guidance material on the application and use of seasonal outlooks for water-related hazard forecasting and prediction	Technical report and workshops – increased capabilities in NMHSs	Water, Climate and Risk Management	CHy	X	X	X	X	In-kind contributions and support from Secretariat and extrabudgetary funds for target areas

Key Outcome 2.2	National integrated flood management plans are developed								Source of funding
Key Performance Indicators	<ul style="list-style-type: none"> Number of Members establishing flood management plans Number of regional hydrological forecasting systems established in transboundary basins 								
Activities	Deliverables	Programme	TC	2016	2017	2018	2019		
Review and update guidance material on Integrated Flood Management provided through the APFM, including responding to new and emerging requests.	Technical guidance material, workshops and knowledge management website	Hydrological Forecasting and Prediction	CH y	X	X	X	X	In-kind contributions and support from Secretariat and extrabudgetary funds for target areas	

Key Outcome 2.3	Drought early warning systems are improved								Source of funding
Key Performance Indicators	<ul style="list-style-type: none"> NMHSs and Regional Centres issuing drought early warnings Satisfaction in drought early warning systems issued by NMHSs and Regional Centres 								
Activities	Deliverables	Programme	TC	2016	2017	2018	2019		
Prepare guidelines for the development of drought early warnings of relevance to decision-making in the water sector.	Technical guidance and workshops – increased capabilities of NMHSs	Water, Climate and Risk Management	CH y	X	X	X	X	In-kind contributions and support from Secretariat	

Expected Result 3

Enhanced capabilities of Members to produce better weather, climate, water and related environmental information, predictions and warnings to support in particular, reduced disaster risk and climate impact and adaptation strategies

Key Outcome 3.2	Climate information and prediction products for climate adaptation and risk management are improved								Source of funding
Key Performance Indicators	<ul style="list-style-type: none"> Number of operational Regional Climate Centres providing inputs for the National Climate Centres Number of Members with formal NCCs, accessing global and regional products, using guidance materials and transmitting climate products for national needs Number of Members interacting with users while providing climate services, through formal mechanisms including National Climate Outlook Forums, in support of adaptation and climate risk management in key socio-economic sectors Members using best practices for climate adaptation and risk management in key socio-economic sectors 								
Activities	Deliverables	Programme	TC	2016	2017	2018	2019		
Provide advice and guidance on relevant hydrological risk management issues related to climate variability and change	Informed decisions associated with CHy related risk management issues (floods and droughts)	Hydrological Forecasting and Prediction	CHy	X	X	X	X	In-kind contributions and support from Secretariat	
Continue to develop, in close cooperation with CAgM and CCI, activities to support hydrological drought prediction capabilities	Manual on Hydrological Drought Prediction.	Hydrological Forecasting and Prediction	CHy	X	X	X	X	In-kind contributions and support from Secretariat and extrabudgetary funds for target areas	
Establish a network of hydrological stations that will show the impacts of climate variability and change in the data	Data from climate sensitive hydrological stations available and accessible	Water, Climate and Risk Management	CHy	X	X	X	X	In-kind contributions and support from Secretariat	
Provide a component of the GFCS User Interface Platform for the water sector	Improved climate services meeting the needs of the water resources information users	Water, Climate and Risk Management	CHy	X	X	X	X	In-kind contributions and support from Secretariat	

Key Outcome 3.3	Hydrological information and products, including water resources assessments, are improved								Source of funding
Key Performance Indicators	<ul style="list-style-type: none"> Number of Members having established a Quality Management Framework for Hydrology using current guidance materials for hydrology and water resources management Number of regional hydrological databases developed in transboundary river basins 								
Activities	Deliverables	Programme	TC	2016	2017	2018	2019		
Application of the guidance material on the definition and implementation of a Quality Management System (QMS) for NHSs	Improved capabilities of Members through guidance material and workshops	Quality Management Framework Hydrology	CHy	X	X	X	X	In-kind contributions and support from Secretariat	
Review of material for the <i>Technical Regulations</i> (WMO-No. 49);	Revised editions of the TRs	Quality Management Framework Hydrology	CHy	X	X	X	X	In-kind contributions and support from Secretariat	

Promulgate the results of the assessment of performance of flow measurement instruments and techniques against WMO standards based on the project proposal developed during the previous intersessional period	Improved capabilities of Members through guidance material and workshops	Quality Management Framework Hydrology	CHy	X	X	X	X	In-kind contributions and support from Secretariat
Obtain international acceptance of standards, formats and protocols for data transfer	Assist in the implementation of agreed international data transfer standards	Data Operations and Management	CHy	X	X	X	X	In-kind contributions and support from Secretariat
Monitoring advances and assist in the development of new technologies for Hydrometric Monitoring	Improved capabilities of Members through guidance material and workshops	Quality Management Framework Hydrology	CHy	X	X	X	X	In-kind contributions and support from Secretariat
Conduct training and workshops using the Manual on Water Resources Assessment	Improved capabilities of members in Water Resources Assessment	Water Resources Assessment	CHy	X	X	X	X	In-kind contributions and support from Secretariat
Monitor and report on the development of improved areal estimation of evaporation, evapotranspiration and soil moisture.	State-of-the-art report, including methodological approaches to assessment of basic moisture regime characteristics (evaporation, soil moisture).	Water Resources Assessment	CHy	X	X	X	X	In-kind contributions and support from Secretariat
Monitor, report and prepare guidance material on the current status of network design and optimization, including the use of modelling	Efficient and effective monitoring systems – link to WIGOS	Water Resources Assessment	CHy	X	X	X	X	In-kind contributions and support from Secretariat
Promote and distribute the Information Note on ecological flow requirements and ecological assessment, taking into account the activities of other groups	Report with proposals on elaboration of determination of ecological flow, adverse effects on water objects, maximum admissible impact on water objects and runoff withdrawal. Case-studies	Water Resources Assessment	CHy	X	X	X	X	In-kind contributions and support from Secretariat
Promote capacity-building in the use of CHy Manuals, e.g. Manual on Low Flows, Manual on Flood Forecasting, etc.	Improved capabilities of Members through guidance material and workshops using material prepared by CHy.	Hydrological Forecasting and Prediction	CHy	X	X	X	X	In-kind contributions and support from Secretariat and extrabudgetary funds for target areas
Prepare guidance material on the potential use of the current capabilities in regional climate modelling (RCM) for water resources assessment and management	Document on the current capabilities in regional climate modelling (RCM) for water resources assessment and management	Water, Climate and Risk Management	CHy	X	X	X	X	In-kind contributions and support from Secretariat
Promote data rescue activities	Guidance available on data rescue for hydrological data	Data Operations and Management	CHy	X	X	X	X	In-kind contributions and support from Secretariat
Promote, monitor, report and provide advice on the application of Resolution 25 (Cg-XIII) by Members and in particular in HYCOS projects	Results of previous survey evaluated. Recommendations and guidance prepared	Data Operations and Management	CHy	X	X	X	X	In-kind contributions and support from Secretariat
Monitor, report and provide advice on the activities of the international data centres and address the international data requirements	Existing international data centres surveyed. Improved operation of International Data Centres.	Data Operations and Management	CHy	X	X	X	X	In-kind contributions and support from Secretariat

Expected Result 4

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

Key Outcome 3.2	Climate information and prediction products for climate adaptation and risk management are improved							Source of funding
Key Performance Indicators	<ul style="list-style-type: none"> • Number of operational Regional Climate Centres providing inputs for the National Climate Centres • Number of Members with formal NCCs, accessing global and regional products, using guidance materials and transmitting climate products for national needs • Number of Members interacting with users while providing climate services, through formal mechanisms including National Climate Outlook Forums, in support of adaptation and climate risk management in key socio-economic sectors • Members using best practices for climate adaptation and risk management in key socio-economic sectors 							
Activities	Deliverables	Programme	TC	2016	2017	2018	2019	
Provide advice and guidance on relevant hydrological risk management issues related to climate variability and change	Informed decisions associated with CHy related risk management issues (floods and droughts)	Hydrological Forecasting and Prediction	CHy	X	X	X	X	In-kind contributions and support from Secretariat
Continue to develop, in close cooperation with CAgM and CCI, activities to support hydrological drought prediction capabilities	Manual on hydrological drought prediction	Hydrological Forecasting and Prediction	CHy	X	X	X	X	In-kind contributions and support from Secretariat and extrabudgetary funds for target areas
Establish a network of hydrological stations that will show the impacts of climate variability and change in the data	Data from climate sensitive hydrological stations available and accessible	Water, Climate and Risk Management	CHy	X	X	X	X	In-kind contributions and support from Secretariat
Provide a component of the GFCS User Interface Platform for the water sector	Improved climate services meeting the needs of the water resources information users.	Water, Climate and Risk Management	CHy	X	X	X	X	In-kind contributions and support from Secretariat

III.3 COMMISSION FOR ATMOSPHERIC SCIENCES (CAS) OPERATING PLAN 2016-2019

Expected Result 5

Enhanced capabilities of Members to contribute to and draw benefits from the global research capacity for weather, climate, water and the related environmental science and technology development

Key Outcome 5.2		Research in the prediction of high-impact weather on time scales of hours to seasons is enhanced						Source of funding
Key Performance Indicators		<ul style="list-style-type: none"> Increased research on operations products and services Improvements in the number of internationally coordinated NMHS in developing and least developed countries contributing to relevant regional and international research initiatives, weather research initiatives and/or forecast demonstration projects completed 						
Activities	Deliverables	Programme	TC	2016	2017	2018	2019	
Sub-Seasonal to Seasonal (S2S) prediction research project as a joint WWRP and WCRP initiative. Project duration: 5 years + 5 years based on assessment of progress, starting from 2014	Improved predictive skill on the sub-seasonal to seasonal timescale based on the improved understanding of Earth-system processes that contribute to such skill. A fundamental contribution to the GFCS. Contributing towards DRR, Service Delivery and Capacity Development	WWRP, jointly with WCRP	CAS	X	X	X	X	S2S Trust Fund plus support by secretariat and International Coordination Office
Polar Prediction research Project (PPP) as the hours to seasonal timescale research contribution to GIPPS and conducted in close collaboration with the WCRP Polar Climate Predictability Initiative. Project duration: 10 years starting from 2014	Improved predictive skill in polar region and the improved understanding of links between polar and extra-polar weather. Contributing towards DRR, GFCS, Service Delivery and Capacity Development	WWRP in collaboration with WCRP	CAS	X	X	X	X	PPP Trust Fund plus support by secretariat and International Coordination Office
High Impact Weather (HIWeather) Research Project for forecasts covering hours to days and promoting the socio-economic applications of such predictions in key sectors. Project duration: 5 years starting from 2015	Improved predictive skill of high impact weather events at high spatial and temporal resolutions focussing on priority applications including the urban environment, hydrological events. Contributing towards DRR, Service Delivery and Capacity Development	WWRP	CAS	X	X	X	X	HIWeather Trust Fund plus support by secretariat and International Coordination Office
Improving the understanding and modelling of water related processes in the atmosphere and its impact on hydrology as a key ingredient in DRR and resource management. Ongoing.	Enhanced focus on water-related processes and impacts in the projects and activities of WWRP. Research Development and Forecast Demonstration Projects (RDPs/FDPs) focussing on weather-water related phenomena	WWRP	CAS in cooperation with CHy and CBS	X	X	X	X	Regular budget to ensure coordination with WMO

Key Outcome 5.3		Atmospheric chemistry observations and assessment meet needs of environmental conventions and policy assessments							Target
Key Performance Indicators		<ul style="list-style-type: none"> Regular bulletins on global atmospheric chemistry are provided to environmental conventions and policy assessments Number of technical reports, measurement guidelines and scientific analyses linking atmospheric chemistry to weather, climate, water and the environment 							
Activities	Deliverables	Programme	TC	2016	2017	2018	2019		
Research to support services for Megacities and large urban complexes linking weather, climate, water and related environmental phenomena. A cross-cutting initiative. Project duration: 10 years starting 2014	Improved urban observations, data assimilation and predictive skill tailored for the urban environment and in support policy, planning, routine decisions and risk management. Contributing towards DRR, GFCS, WIGOS/WIS, Service Delivery and Capacity Development	GAW, WWRP in collaboration with PWS, DRR, WCRP, GFCS	CAS in cooperation with CBS	X	X	X	X	Megacity trust plus Secretariat support and coordination	
Integrated Greenhouse Gas Information System to support policy and provide regionally relevant information on sources and sinks. Project Duration: 10 years starting 2015	Improved GHG observations, data assimilation and modelling of the carbon cycle as an independent, science-based input to support policy and operational decisions on Greenhouse gas mitigation strategies and their effectiveness. Contributing towards GFCS, WIGIS/WIS, Service Delivery and Capacity Development	GAW	CAS	X	X	X	X	Regular budget to ensure coordination within WMO and with partners	
Research to support informed decisions and policy advice on geoengineering. Duration 5 years starting 2014	Informed role for WMO regarding geoengineering, a UN-wide position and framework and knowledge gaps addressed through research	GAW, WWRP, WCRP	CAS	X	X	X		Regular budget to ensure coordination within WMO and with partners	
Establishment of an integrated global aerosol observation system in support of weather, climate, air quality and health applications Duration: 10 years starting 2016	Improved aerosol observations and data assimilation process for aerosols in support of improved weather, climate and air quality forecasts as well as health applications	GAW in collaboration with WWRP WGNE	CAS	X	X	X	X	Regular budget to initiate, provide guidance and coordinate Member initiatives on aerosol observations	

III.4 COMMISSION FOR CLIMATOLOGY (CCL) OPERATING PLAN 2016-2019

Expected Result 3 (Data processing and forecasting)										
Enhanced capabilities of Members to produce better weather, climate, water and related environmental information, predictions and warnings to support in particular disaster risk reduction and climate impact and adaptation strategies										
Key Outcome 3.1		Improved climate monitoring, long range forecasts and long-term projections								Source of funding
Key Performance Indicators		<ul style="list-style-type: none"> Number of Members issuing (a) monthly predictions, (b) seasonal predictions, (c) climate watch bulletins and (d) long term projections Key Performance Indicator: Perceived quality of the issued (a) monthly predictions, (b) seasonal predictions, (c) climate monitoring and watch bulletins and (d) long term projections Key Performance Indicator: Perceived timeliness of the issued (a) monthly predictions, (b) seasonal predictions, (c) climate monitoring and watch bulletins and (d) long term projections Progress in the volume of rescued and digitized climate archives by the Members 								
Activities	Deliverables	Programme	TC	Resp. Dept.	2016	2017	2018	2019		
To promote adherence to WMO quality management guidelines as applicable to the Commission's work	Guideline on Quality Management in Climate services	WCP	CCI	CLW, OBS	X	X	X	X	Regular Budget-Secretariat	
Climate Data Management Systems Specifications (CDMSS)	Updated Technical regulations to incorporate CDMS Specifications in the WMO technical regulations	WCP	CCI	OBS	x	x	x	x	Regular Budget-Secretariat	
Capacity development in Data Rescue and Data Management	Establish Long term Data rescue and management programmes in the regions	WCP	CCI	OBS	x	x	x	x	Extra-budgetary funds	
Design and Implementation of International Data Rescue Portal (I-DARE)	I-DARE Portal	WCP	CCI	OBS	x	x	x	x	Extra-budgetary funds	
Fostering Inter-Programme collaboration on climate data modernisation	Manual on Global Data Management System for Climate	WCP	CCI	OBS	x	x	x	x	Regular Budget-Secretariat	
Guide the development of observation networks for climate services.	Guidelines on climate reference networks	WCP	CCI	OBS	x	x	x	x	Regular Budget-Secretariat	
Assessment and certification of long term observing stations- centennial stations- capacity development on the implementation of climate monitoring and watches	Guidance on the submission and recognition mechanism for long term -centennial – stations	WCP	CCI,	OBS	x	x	x	x	Regular Budget-Secretariat	
Developing new climate indices and guidance, particularly for marine indices	Updated WMO technical regulations with training on climate products and climate watches	WCP	CCI	OBS,	x	x	x	x	Regular Budget-Secretariat	
Finalizing the work on extreme weather and climate events	List of new indices and updated guidance for their computation	WCP	CCI (with JCOMM)	OBS	x	x	x	x	Regular Budget-Secretariat	
	Guidance on the definition of monitoring weather and climate extremes	WCP	CCI	OBS	x	x	x	x	Regular Budget-Secretariat	

Development of National Climate Monitoring Products	Guidance on provision and dissemination of National Climate Monitoring Products	WCP	CCI,	OBS	x	x	x	x	Regular	Budget-Secretariat
Monitoring global weather and climate extremes records	Update of World Records of Weather and Climate Extremes (WRWCE) on the WMO website	WCP	CCI	OBS	x	x	x	x	Regular	Budget-Secretariat
Review the potential of using additional satellite products in the WMO Climate System Monitoring	Guidance on using remote sensed data in the WMO climate System Monitoring	WCP	CCI	OBS	x	x	x	x	Regular	Budget-Secretariat
Provision of regular WMO statements on climate	Publication of WMO Annual Statements on Global Climate and a 5 year climate Statement	WCP	CCI	OBS	x	x	x	x	Regular	budget
homogenisation of climate observational data	Publication of guidance on homogenisation methods and tools	WCP	CCI	OBS	x	x	x		Regular	Budget-Secretariat
WMO Statements on Climate	Publication of WMO Annual Statements on Global Climate and a 5 year climate Statement	WCP	CCI	OBS	x	x	x	x	Regular	budget
Creation and distribution of 1981-2010 climatological standard normal datasets	Create a new version of the WMO Publication No 847	WCP	CCI	OBS	x	x	x	x	Regular	Budget-Secretariat
Finalize a guidance on best operational practices in RCC implementation, and consensus development approaches, particularly in RCOFs and national mechanisms	Development of a Monitoring Document on designation and performance; Development of standards for mandatory functions and products	WCP	CCI, CBS	CLW, OBS	x	x			Regular	Budget-Secretariat
Development and Dissemination of Climate Services Toolkit	Workshop to build a preliminary version of the Climate Services Toolkit; Toolkit demonstration, training and dissemination	WCP	CCI	CLW, OBS	x	x	x		Regular	Budget-Secretariat
Key Outcome 3.2	Climate information and prediction products for climate adaptation and risk management are improved								Source of funding	
Finalize the concept of a workshop for the sector- and climate risk-specific indices	Generalized concept for organizing workshops on the application of sector- and climate risk specific indices	WCP	CCI	CLW, OBS, WDS	x				Regular	Budget-Secretariat
Finalize the "ClimPACT" software and extend it to include indices relevant for sector impacts	ClimPACT" tool finalized and user manual published	WCP	CCI	CLW, OBS	x	x			Regular	Budget-Secretariat
Organize regional workshops on Enhancing Climate Indices for Sector-Specific Applications in different sub-regions, and the use of ClimPACT tool	Regional workshops Enhancing Climate Indices for Sector-Specific Applications and use of "ClimPACT" tool in different regions	WCP	CCI	CLW	x	x	x	x	Regular	Budget-Secretariat, Extrabudgetary resources
Publish a guidance on climate risk management concepts at the national level	The draft reviewed and the guidance is published	WCP	CCI	CLW, OBS, WDS	x				Regular	Budget-Secretariat

Develop guidance on user participation in RCOFs and sector-specific COFs	Review user engagement in the ongoing RCOF sessions, and develop a guidance	WCP	CCI	CLW	x	x	x		Regular Secretariat, Extrabudgetary resources
Submit amendments to the technical regulations for approval by Congress	Under Review by ET-QM and other relevant ETs	WCP	CCI	CLW, OBS			X		Regular Secretariat
Updating the guide to Climatological practices to include Guidance on new methodology for climate normals	Updated text on climate normal will be included in the Guide to Climatological Practices	WCP	CCI	CLW, OBS	X	X			Regular Secretariat
Include climate change projections in the product portfolio of RCC mechanisms (in collaboration with WCRP)	Development of regional scenarios guidance (implementation, use, linkage with RCOFs, regional workshops, etc.); Possible joint workshops in collaboration with WCRP	WCP	CCI	CLW, RES	x	x	x		Regular Secretariat, Extrabudgetary resources
Provide guidance on standardization of RCC products and services and other operational aspects of the RCCs	Review of current operational practices in providing RCC products ; CBS/CCI Workshop on Operational Climate Prediction; RCC workshops in coordination with ET-RCC meetings	WCP	CCI	CLW	x	x			Regular Secretariat, Extrabudgetary resources
Develop technical guidance for enhancing, strengthening and expanding the RCOF process.	Updating of RCOF Review-2008 Position Papers ; Development of technical guidance on tools and operational practices (including verification); Demonstration of guidance in RCOF sessions;	WCP	CCI	CLW	x	x			Regular Secretariat
Develop technical guidance on the NCOF and NCF concept and practical approaches for their implementation	Technical guidance for NCOFs/NCFs implementation finalized Refinement of guidance through NCOF showcases.	WCP	CCI	CLW	x	x			Regular Secretariat
Facilitate and coordinate implementation of NCOFs, NCFs	NCOFs/NCFs demonstrations in selected countries	WCP	CCI	CLW	x	x	x	x	Regular Secretariat, Extrabudgetary resources
Develop guidelines for users to facilitate the use of climate information and products, and integration of climate information into climate risk management	Review and refine available guidance and conduct showcase workshops.	WCP	CCI	CLW	x	x			Regular Secretariat, Extrabudgetary resources
Develop guidance on promoting climate risk management concept, e.g. through regional and sector-specific workshops	Guidance manual published; CRM Workshop (2017)	WCP	CCI	CLW	x	x	x		Regular Secretariat
Develop CSIS Technical Reference Manual which covers key activities under the WCSP	ICT-CSIS Meeting; Finalized CSIS Technical Reference Manual.	WCP	CCI	CLW	x	x	x		Regular Secretariat
Establish CSIS National Focal Points (CSIS-NFP), with support of the Secretariat in	Nomination of NFPs through communications with the PRs	WCP	CCI	CLW	x				Regular Secretariat

facilitating NFPs nomination, and maintaining the list of NFPs	Establishment of reporting processes for NFPs and synthesis of national reports								
Develop detailed ToR for the CSIS-NFPs, with periodic refinement, if needed, and guide NFPs work	Establishment of the ToRs of CSIS NFPs; Guidance material for NFPs	WCP	CCI	CLW	x	x	x		Regular Budget-Secretariat
Develop interpretation guidance to facilitate use of GPC and LC forecast and verification products by RCCs, RCOFs and NMHSs	Guidance development CBS/CCI Workshop on Operational Climate Prediction	WCP	CCI	CLW	x	x	x		Regular Budget-Secretariat
Review the Manual on the GDPFS (WMO-No. 485) and propose updates concerning extended and long-range forecasts	Manual on the GDPFS reviewed jointly with CBS	WCP	CBS, CCI	CLW	x	x	x		Regular Budget-Secretariat
Review developments in verification scores and practices, and suggest updates to the Standardized Verification System for Long-range Forecasts (SVSLRF)	Provide input to CBS in reviewing and updating developments of verif. scores Provide inputs relevant to RCCs, RCOFs and NMHSs to CBS.	WCP	CBS, CCI	CLW	x	x	x		Regular Budget-Secretariat
Develop implementation plan for operationalizing the GCSU with involvement of potential contributors	Formal arrangements for operational production of GSCU, through KMA and NOAA/NWS	WCP	CCI	CLW	x	x	x		Regular Budget-Secretariat
Complete GSCU development for operational implementation and dissemination (in collaboration with CBS)	Formal arrangements for operational production of GSCU, through KMA and NOAA/NWS and Demonstration of real-time GSCU and full-blown operationalization	WCP	CCI	CLW,OBS	x	x	x		Regular Budget-Secretariat, Extrabudgetary resources
Introduce new methods, techniques and new parameters (hydrological products, climate change projections, etc.) in RCOF operations	Technical guidance to support interfaces for Climate information delivery mechanisms – based on the analysis of existing case studies	WCP	CCI	CLW	x	x	x		Regular Budget-Secretariat

Expected Result 6 (Capacity Development)

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

Key Outcome 6.2 **Infrastructure and operational facilities of NMHSs and Regional Centres are improved, particularly in developing and least developed countries**

Key Performance Indicator • **Number of NMHSs with improved infrastructure and operational facilities**

Activities	Deliverables	Programme	TC	Resp. Dept.	2016	2017	2018	2019	
Develop Guidance Note on enhancing infrastructural effectiveness of climate practices in NMHSs	Guidance Note on infrastructural requirements for climate practices/services	WCP	CCI	CLW	X				Regular Budget-Secretariat
Develop Guidance Note on enhancing institutional structures and best practices to support climate services	Guidance Note on institutional requirements for climate practices/services (to be merged with infrastructural) in one publication	WCP	CCI	CLW	X				Regular Budget-Secretariat
Further developing and updating CCI webpage for Quality Management	Updated webpage hosted by Turkish State Met. Service-TSMS	WCP	CCI	CLW	X	X	X	X	Regular Budget-Secretariat
Develop an integrated concept for implementation of Quality Management in climatology	Guidance note on gap analysis and quality management in climate services	WCP	CCI	CLW	X				Regular Budget-Secretariat
Writing a section in the Guide to Climatological Practices (WMO 100) on Quality Management	Adding new chapter on Quality Management to Guide to Climatological Practices (WMO-100)	WCP	CCI	CLW	X				Regular Budget-Secretariat
Updating the Guide to Climatological Practices	New version of the Guide to Climatological Practices (WMO-100)	WCP	CCI	CLW	X	X			Regular Budget-Secretariat

Key Outcome 6.3 **Education and training development facilities at national and regional levels are improved, especially in developing and least developed countries**

Key Performance Indicators • **Number of RTCs providing education and training support for GFCS related activities**
 • **Degree to which Members are getting value for money from the WMO Fellowship Programme**
 • **Degree of Member satisfaction with the Regional Training Centres (RTCs) in use**

Activities	Deliverables	Programme	TC	Resp. Dept.	2016	2017	2018	2019	
Develop strategy to implement Competency Standards	Strategy paper on implementation of competency standards in climatology	WCP	CCI	CLW	X				Regular Budget-Secretariat
Develop curriculum for climatology and advise on e-learning in cooperation with	Defining updated curriculum for climatology in cooperation with ETR	WCP, ETR	CCI	CLW	X	X			Regular Budget-Secretariat

ETR									
Expected Result 7 (Partnerships)									
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 strategic issues									
Key Outcome 7.1	WMO leadership and contribution in relevant UN system and other international partners' initiatives and programmes is improved								Source of funding
Key Performance Indicator	<ul style="list-style-type: none"> • Number of reports of WMO and its co-sponsored programmes submitted to UN and other international conventions, particularly the UNFCCC, UNCCD and UNCBD • Number of contracts/cooperation agreements within which WMO is engaged with partners • Number of NMHSs implementing projects with the UN and other international and/or regional organizations 								
Activities	Deliverables	Programme	TC	Resp. Dept.	2016	2017	2018	2019	
Enhancing the use of Social Media in climatology	<ol style="list-style-type: none"> 1) Guidance note on the Role of Social Media in Climatology 2) Creating and implementing CCI accounts on Tweeter, Youtube and Facebook. 	WCP	CCI	CLW	X				Regular Budget-Secretariat

ER 1- Service delivery

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

ER 2- Disaster risk reduction

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

ER 3- Data processing and forecasting

Enhanced capabilities of Members to produce better weather, climate, water and related environmental information, predictions and warnings to support in particular disaster risk reduction and climate impact and adaptation strategies

ER 4- Observations and data management

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

ER 5- Research

Enhanced capabilities of Members to contribute to and draw benefits from the global research capacity for weather, climate, water and the related environmental science and technology development

ER 6- Capacity Development

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

ER 7- Partnerships

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 strategic issues

ER 8- An effective and efficient Organization

- III.5 COMMISSION FOR AERONAUTICAL METEOROLOGY (CAEM) OPERATING PLAN 2016-2019 (TO BE SUBMITTED)**
- III.6 COMMISSION FOR AGRICULTURAL METEOROLOGY (CAGM) OPERATING PLAN 2016-2019 (TO BE SUBMITTED)**
- III.7 COMMISSION FOR BASIC SYSTEMS (CBS) OPERATING PLAN 2016-2019 (TO BE SUBMITTED)**
- III.8 JOINT WMO-IOC COMMISSION FOR OCEANOGRAPHY AND MARINE METEOROLOGY (JCOMM) OPERATING PLAN 2016-2019 (TOBE SUBMITTED)**

IV. REGIONAL ASSOCIATIONS OPERATING PLANS

IV.1 REGIONAL ASSOCIATION I (AFRICA) OPERATING PLAN 2016-2019

Regional Association I (RA I) has identified seven priorities, five strategic thrusts and eleven expected results, which are aligned with WMO and AMCOMET Plans. These priorities also form the basis for the Operating Plan for the Region.

RA I (Africa) Priority Areas for 2016 – 2019	Strategic Thrust / High-level initiatives or Drivers	Expected Results
<ul style="list-style-type: none"> • Service Delivery • Aeronautical and Marine Meteorological Services 	Strategic Thrust 1: Improvement of Services and Service Delivery in NMHSs and in particular for the Aviation and Marine Sectors	Expected Result 1: <i>Improved service quality and service delivery in all sectors and particularly in aviation and marine sectors</i>
<ul style="list-style-type: none"> • Disaster Risk Reduction 		Expected Result 2: <i>Reduced disaster risks</i>
<ul style="list-style-type: none"> • Global Framework for Climate Services 	Strategic Thrust 2: <i>Advancement of Scientific Research and Application, as well as Development and Implementation of Technology to Support the Provision of Weather and Climate for Climate Change Adaptation and Mitigation</i>	Expected Result 3: <i>Improved data processing, modelling and impact-based forecasting of weather, climate and water as well as climate change negotiations</i>
<ul style="list-style-type: none"> • WMO Integrated Global Observing System and WMO Information System 		Expected Result 4: <i>Improved Data rescue and Database management systems</i>
<ul style="list-style-type: none"> • Capacity Development <ul style="list-style-type: none"> - Human Capital - Infrastructure Development - Institutional Transformation 	Strategic Thrust 3: <i>Capacity Development for the Production and Delivery of Weather and Climate Services to key productive sectors (agriculture, water, health, DRR & energy) as a contribution to Sustainable Development</i>	Expected Result 5: <i>Improved systematic data observations and data exchanges</i>
Governance	Strategic Thrust 4: <i>Enhancement of Cooperation and Partnerships with Relevant Institutions to improve Funding Mechanisms for development of NMHSs in LDCs</i>	Expected Result 6: <i>Advance targeted research and technology development for the implementation of Global Framework for Climate Services (GFCS) at the national and regional levels</i>
	Strategic Thrust 5: <i>Strengthening Good Governance in NMHSs and Increase Political Support for Their Recognition and Regional Climate Centres</i>	Expected Result 7: <i>Strengthened capacity development in RA I and LDCs</i>
		Expected Result 8: <i>Strengthened partnership and cooperation in RA I</i>
		Expected Result 9: <i>Well-established funding mechanisms for activities in RA I, with a particular focus on LDCs</i>
		Expected Result 10: <i>Improved effective and efficiency in NMHSs and RA I activities</i>
		Expected Result 11: <i>Improved visibility and relevance of NMHSs with appropriate legislation and policy formulation</i>

PROGRAMMES

(a) **Improved services of high impact weather and climate events for disaster risk reduction:** To improve the effectiveness of high quality impact-based forecasts and multi-hazard early warnings of high impact meteorological, hydrological and related environmental hazards, thereby contributing to international efforts on disaster risk reduction, resilience and prevention;

(b) **WMO Integrated Global Observing System/WMO Information System (WIGOS/WIS):** To complete the implementation of the WIGOS/WIS focusing on the interoperability building blocks of the framework and supporting their acceptance and implementation at regional and national levels;

(c) **Aviation and Marine meteorological services:** To improve the ability of NMHSs to meet International Civil Aviation Organization (ICAO) requirements by: (a) accelerating the implementation of ICAO/WMO competency standards and Quality Management Systems (QMS); (b) addressing the emerging needs and challenges associated with the global air navigation plan; (c) strengthening cost recovery frameworks in aviation and marine;

(d) **Global Framework for Climate Services (GFCS):** To implement climate services under the GFCS particularly for countries that lack them by: (a) provide guidance for establishment of the National Framework for Climate Services (NFCS); (b) the establishment of regional climate centres; (c) identifying user requirements for climate products, particularly in agriculture, hydrology and water resources, health disaster risk reduction, energy; (d) developing the Climate Services Information System (CSIS); (e) advancing the Subseasonal to Seasonal (S2S) Prediction Project; and (f) facilitating the implementation of the activities of the Climate Research for Development (CR4D) Agenda;

(f) **Capacity Development:** To enhance the capacity of NMHSs to deliver on their mission by assisting with human resource development, technical and institutional capacities and improved infrastructure using modern technologies, particularly in developing, Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Member Island Territories.

Expected Results in details

1.

- *Improved service quality and service delivery in all sectors and particularly in aviation and marine:* Enhanced capabilities of Members to deliver customer tailored products and services and improve access to high-quality weather, climate, water and related environmental predictions, information, warning and services in response to users' needs, and to enable their use in decision-making by relevant societal sectors, with particular attention to the aviation and marine sectors

2.

- *Reduced disaster Risk:* Enhanced capabilities of Members to reduce risks and potential impacts of hazards caused by weather, climate, water and related environmental elements
- *Improved data processing, modelling and forecasting weather, climate and water as well as climate negotiations:* Enhanced capabilities of Members to produce better weather, climate, water and related environmental information, predictions and warnings to effectively contribute to climate negotiations and also support in particular, reduced disaster risk and climate impact and adaptation strategies
- *Improved data rescue and database management systems:* Enhanced capabilities for data rescue and Climate Database Management System (CDMS) including user forum as a cost-effective means for CDMS modernization, maintenance and information sharing. In addition, developed capacity in the use of CLIMSOFT, Climate Watch advisories, data rescue, and CDMS implementation at national level.
- *Improved observations and data exchanges:* Enhanced capabilities of NMHSs and Regional Climate Centres (RCCs) to observe, monitor, exchanges data, produce and disseminate high quality information and use integrated and interoperable surface- and space-based observation systems for weather, climate and hydrological observations, as well as related environmental and space weather observations, based on world standards set by WMO
- *Advance targeted research and technology development for the implementation of Global Framework for Climate Services (GFCS) at the national and regional levels:* Enhanced capabilities of Members to contribute to and draw benefits from the global research capacity for weather, climate, water and the related environmental science and technology development in order to mainstream climate services into national economic planning and programmes through the implementation of GFCS in Africa
- *Strengthened capacity development in RA I and LDCs:* Enhanced capabilities of NMHSs, in particular in Developing and Least Developed Countries and Small Island Developing States, to fulfil their mandates

3.

- *Strengthened partnership and cooperation in RA I:* New and strengthened partnerships and cooperation activities to improve NMHSs' performance in delivering services and to demonstrate the value of WMO contributions within the United Nations system, relevant regional organizations, international conventions and national strategies
- *Well-established funding mechanisms for activities in RAI and particularly for LDCs:* Established funding mechanism, including donor support programmes at national and continental scale aimed at developing and strengthening capacity of NMHSs in the production and delivery of services
- *Improved effective and efficiency in NMHSs and RA I Activities:* An efficient and

effective management of NMHSs, RCCs and RA I activities

- *Improved visibility and relevance of NMHSs with appropriate legislation and policy formulation:* Enhanced visibility and relevance of the NMHSs and Regional Climate Centres (RCCs) and well formulated legislation and policies, thereby contributing to sustainable development at the national, sub-regional and continental levels

REGIONAL ASSOCIATION I (AFRICA)

EXPECTED RESULTS, KEY OUTCOMES AND KEY PERFORMANCE INDICATORS

4. Expected Result 1: <i>Enhanced capabilities of Members to deliver customer tailored products and services and improve access to high-quality weather, climate, water and related environmental predictions, information, warning and services in response to users' needs, and to enable their use in decision-making by relevant societal sectors with particular attention to the aviation and marine sectors</i>			
KO 1.1	Improved access to seamless weather, climate, water, and related environmental products and services (e.g. warnings, forecasts and	KPI 1.1.1	Number of Members demonstrating quantitative measurements of the socio-economic benefits of their
		KPI 1.1.2	Percentage of NMHSs with regular access to products provided by global and
KO 1.2	Delivery of weather, climate, water and related environmental products and services to users' communities is improved	KPI 1.2.1	Number of NMHSs expressing user satisfaction with the: (a) availability, (b) reliability and (c) range of products that are (d) received in time and (e) are an essential contribution to decision-making

Activities

- Ensure that there is a harmonized and synchronized implementation of the WMO Strategy for Service Delivery by NMHSs in RA I as in Resolution 1 (RA I – 16)
- Provide status and implementation of the methodologies for the assessment of Socioeconomic Benefits (SEBs) of Meteorological and Hydrological Services and arrange training for senior staff of NMHSs including developing pilot projects on testing the methodologies.
- Develop communication and dissemination capabilities as well as training of staff in television weather broadcast in the Region
- Scale up the necessary skills on the impact-based forecast and warning services
- Undertake in-country Common Alerting Protocol (CAP) Jump-Start Workshops
- Encourage Members to increase the number of cities for which they provided forecasts, the lead-time, as well as the frequency of updating the forecasts
- Assist Members of RA I in developing forecasts where weather related diseases are a challenge

- Improve the mutual awareness and proper integration of the aeronautical meteorology in the national plans for enhancing air traffic management in accordance with the Global Air Navigation Plan (GANP)
- Support concrete actions and projects aimed at improving the meteorological services to aviation, in particular for NMHSs suffering from long-standing deficiencies of those services
- Organize as soon as possible in coordination with relevant international and regional partners, an African Conference for Aviation that would build on the outcomes of the Conjoint MET Divisional Meeting of July 2014
- Support in capacity development related to the QMS implementation including preparation to adopt the new ISO 9001:2015
- Intensify efforts to assist NMHSs to develop and implement cost-recovery mechanisms through focused projects, trainings and improved guidance material
- Develop more guidance on appropriate cost-recovery mechanisms for those NMHSs with low traffic volumes with due consideration of the specifics of the flight operations.
- Support in the establishment of transition plans in close coordination with ICAO Regional Offices in RA I as a planned migration to the digital OPMET exchange in XML/GML format
- Pursue the expansion of the Marine Meteorology (MARINEMET) pilot Project Monitoring and Services, under the Spanish-funded "West Africa Cooperation Programme" to cover all the Gulf of Guinea countries
- Ensure continuing and close coordination with the Coastal Inundation Forecasting Demonstration Project
- Endeavour to include training programme in each JCOMM capacity development activity (programme or project)
- Implement the Storm Surge Watch Scheme (SSWS) and to ensure that it achieves its expected outcomes
- Enforce a continental wide compliance of QMS (including personnel competencies and equipment calibration certification) for aeronautical meteorology in line with Annex 3 of ICAO Convention (1944) and other associated WMO / ICAO guidelines
- Implement and operationalize the AMDAR programme for improvement of services for international air navigation
- Designate, as appropriate, the National Meteorological Service as the weather service provider for the aviation industry
- Undertake regular assessment of the impact of AMDAR data on the quality of forecasts and other weather services provided to air navigation
- Carry out a survey to assess the existing capacities and capabilities of the NMHSs in terms of infrastructure for oceanography and marine meteorology that includes observational network (including the deployment of buoys and tidal gauges), telecommunication systems for data exchange, marine forecasts and dissemination

services, human capacity, including maritime' users community applications

- Implement / enhance the provision of appropriate weather and climate services / information to support: (a). Maritime transport and Navigation (b). Coastal zone management and development through, for example, the prevention of coastal erosion, oil spills and pollution, prevention of the destruction of coral reefs and mangrove forests and other marine ecosystems (c). Use of marine resources for sustainable development through legislation
- Improve data coverage at sea and large lakes (through additional voluntary observing ships and buoys) and access to satellite products relevant to marine applications
- Transform NMHSs into autonomous agencies and develop appropriate mechanisms for cost recovery from maritime services

Expected Result 2: <i>Enhanced capabilities of Members to reduce risks and potential impacts of hazards caused by weather, climate, water and related environmental</i>			
KO 2.1	Multi-hazard early warning systems are implemented	KPI 2.1.1	Number of NMHSs contributing to the implementation of multi-hazard early warning
KO 2.2	National integrated flood management plans are developed	KPI 2.2.1	Number of Members establishing flood management
		KPI 2.2.2	Number of NMHSs participating in regional hydrological forecasting systems for transboundary river
KO 2.3	Drought early warning systems are improved	KPI 2.3.1	NMHSs and Regional Centres that issue drought early warnings

Activities

- Develop applications of space-based observations to weather prediction, climate and environment monitoring, and disaster risk reduction.
- Provide training in DRR targeted at NMHSs' management
- Develop holistic and sector-driven national DRR and climate change adaptation capacity development projects
- Document the Region's initiatives for implementation of climate services for WMO DRR activities and formulate concrete recommendations to WMO constituent bodies
- Initiate Severe Weather Forecasting Demonstration Project (SWFDP) projects in other sub-regions with the success in Eastern and Southern Africa (West Africa – Preliminary meeting has been held late 2015)
- Support RSMC La Reunion and NMHSs of RA I TCC Members to further exploit the use of ensemble techniques in tropical cyclone forecasting and probabilistic forecasts and organize necessary training activities in this regard for the forecasters engaged in tropical cyclone forecasting and warning services in the Region

Expected Result 3: *Enhanced capabilities of NMHSs and RCCs to produce better weather, climate, water and related environmental information, predictions and warnings to effectively contribute to climate change negotiations and also support in particular, reduced disaster risk and climate impact and adaptation strategies that built resilience of countries in RA I (Africa) to cope with climate extremes*

KO 3.1	Improved climate monitoring, long range forecasts and long-term projections	KPI 3.1.1	Number of Members issuing: (a) monthly predictions; (b) seasonal predictions; (c) climate watch bulletins; and (d) long-term projections
		KPI 3.1.2	Perceived quality of the issued: (a) monthly predictions; (b) seasonal predictions; (c) climate watch bulletins; and (d) long-term projections
		KPI 3.1.3	Perceived timeliness of the issued (a) monthly predictions; (b) seasonal predictions; (c) climate watch bulletins; and (d) long-term projections
KO 3.2	Climate information and prediction products for climate adaptation and risk management are improved	KPI 3.2.1	Perceived quality of the products of WMO Regional Climate Centres used at the national level
		KPI 3.2.2	Number of Members operationally developing and disseminating climate products and information for national needs at basic, intermediate and advanced levels
		KPI 3.2.3	Perceived quality of the national climate information and products available in Member countries
		KPI 3.2.4	Number of Members providing targeted/tailored climate information, products and services, through formal mechanisms including National Climate Outlook Forums, to support user requirements in their countries for adaptation and climate risk management in key socio-economic sectors
KO 3.3	Hydrological information and products, including water resources, are improved	KPI 3.3.1	Number of Members using a Quality Management Framework for Hydrology based on current guidance materials
		KPI 3.3.2	Number of regional hydrological databases developed in transboundary river basins

KO 3.4	Drought information and prediction for risk management is improved	KPI 3.4.1	NMHSs and Regional Centres issuing drought information and prediction
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Activities

- Continue to make global, regional or limited-area meteorological prediction model products available on WIS for the benefit of all countries in RA I, and encourage Members contribute information for verification and feedback on their quality and usefulness, especially in forecasting meteorological hazards
- Assist in providing, within the forecaster's training courses, materials on the use and interpretation of their NWP products
- Improve forecasts of sand and dust storms, with focus on countries in the Sahel
- Consider the expansion of the integrated Severe Weather Forecasting Demonstration Project (SWFDP)/ Flash Flood Guidance System (FFGS) programme to other parts of Africa
- Continue to provide support in the transition to the operational phase of the SWFDP project after the demonstration phase has been completed to the developing countries and especially to Least Developed Countries (LDCs)
- Continue the support for capacity development in the use of EPS products
 - Scrutinise hydro-meteorological data and undertake data rescue as appropriate
 - Develop a reference network of hydro-meteorological stations
 - Update rating curves of river gauging stations
 - Carry out filling-in of missing data
 - Rehabilitate and improve the functioning of hydro-met stations
 - Ensure availability of minimum equipment to support hydro-meteorological data collection
- Support efforts to undertake water quality and sediment monitoring and analyses
- Rationalise the hydrometric monitoring networks and stations critical to decision making
- Select stations to support ground-truthing of satellite information
- Undertake studies on recalculation of IDFs to respond to urban flooding including methodologies
- Optimise hydrological stations and carry out regionalization of catchments to provide hydrological data and information
- Develop and promote guidelines on optimisation of the hydrological networks
- Develop products to support service delivery for revenue generation to support hydrological activities in countries
- Develop and promote a catalogue of hydrological information that responds to the needs of users towards generating funds to support hydrological activities

- Redistribute information on WMO Quality Management Framework – Hydrology (QMF-H)
- Enhance the use of Manuals and Guidance materials produced by WMO on the WMO Quality Management Framework- Hydrology (QMF-H)
- Engage in training opportunities available in WMO’s Capacity Building Strategy in Hydrology and Water Resources.

Expected Result 4: Enhanced capabilities for data rescue and Climate Database Management System (CDMS) including user forum as a cost-effective means for CDMS modernization, maintenance and information sharing. In addition, developed capacity in the use of CLIMSOF, Climate Watch advisories, data rescue, and CDMS implementation at			
KO 4.1	Capacity developed in the use of CLIMSOF and other data rescue tools in Africa	KPI 4.1.1	Number of NMHSs using CLIMSOF or other defined data rescue tools
KO 4.2	Data rescue and database management systems improved	KPI 4.2.1	Number of NMHSs undertaking data rescue (DARE) or being involved in regional collaborative data rescue initiatives such as MEDARE
		KPI 4.2.2	Number of Members implementing modern climate data-base management systems (CDMS) and/or climate monitoring systems
		KPI 4.2.3	Number of NMHSs that has completed data rescue process
KO 4.3	Heterogeneous datasets from different platforms are harmonised	KPI 4.3.1	Number of NMHSs that have harmonised data from different platforms at national level

Activities

- Encourage NMHSs to be involved in Climate Watch advisories, data rescue, and CDMS implementation at national level
- Develop opportunities for capacity development in the use of CLIMSOF and in climate data management, CDMS implementation data rescue as well as climate monitoring and assessment.
- Develop mechanisms to harmonise heterogeneous datasets from different platforms in partnership with WIGOS Implementation Plan in Africa
- Initiate climate data related capacity building programmes to further raise the profile of NMHSs as well as underpin climate service capabilities
- Encourage the implementation of the International Climate Assessment and Dataset initiatives under WMO auspices (ICA&D) as a tool for generating relevant products of the WMO RCC mandatory functions on data services and climate monitoring

- Develop fully operational Climate Data Management System (CDMS) to improve the availability of, and access to, quality controlled and long-term climate data that is needed for research, applications and climate services.
- Create a Climate Data-base Management System (CDMS) user groups as a cost-effective means of CDMS modernization, maintenance and information sharing
- Support in the preservation, recovery and digitization of all climate records, so as to prevent climate observations from unrecoverable deterioration.

Expected Result 5: *Enhanced capabilities of NMHSs and RCCs to observe, monitor, exchanges data, produce and disseminate high quality information and use integrated and interoperable surface- and space-based observation systems for weather, climate and hydrological observations, as well as related environmental and space weather observations,*

KO 5.1	WMO Integrated Global Observing System implementation phase is completed during the intersessional period	KPI 5.1.1	Percentage of progress in achieving the key implementation tasks, milestones and deliverables specified by the WIGOS Implementation Plan (WIP)
		KPI 5.1.2	Increased availability of observations for users (as measured by several ratios)
KO 5.2	WMO information System is developed and implemented	KPI 5.2.1	Progress in the implementation of WIS by NMHSs as measured by: (a) percentage of registered WIS centres that have been endorsed as WIS compliant; and (b) number of NMHSs with improved observational data and products as a result of implementation of WIS functions
		KPI 5.2.2	Number of NMHSs whose data processing and management capabilities have enhanced as a result of implementation of WIS functions
KO 5.3	Progress in implementing the Global Climate Observing System	KPI 5.3.1	Percentage of progress in achieving the GCOS Implementation Plan

Activities

- Maintain an inventory of regional and national focal points for WIGOS and WIS in Africa
- Expand the list of regional WIGOS projects to accommodate also sub-regional and national projects
- Update the Regional Basic Synoptic Network (RBSN) and Regional Basic Climatological Network (RBCN) stations in Africa
- Implement the Evolution of Global Observing Systems (EGOS-IP) actions
- Develop siting classification for observing stations on land as published in the Guide to Instruments and Methods of Observations (WMO-No. 8) as a common ISO-WMO standard

- Enhance the volcanic ash monitoring capabilities as part of the RA I WIGOS Implementation Plan including improvements to communication facilities between the observatories and the VAAC in Toulouse, France
- Encourage activities to expand Climate Observation Networks
- Support in the mobilization of additional resources to maintain an effective and sustainable GCOS network in Africa
- Identify and locate the issues linked to the unavailability of core data and support the implementation of national telecommunications network capable of digital exchange of information.
- Encourage the availability of, and access to, quality controlled and long-term climate data in Africa that is needed for research, applications and climate services.
- Encourage Members that operate regional, global or contributing Global Atmospheric Watch (GAW) stations (that monitor background pollution and atmospheric chemical composition) to make sure that their information is updated regularly and to submit GAW observational data to the respective data centres as agreed, normally within one year after the measurement
- AMCOMET through RCCs and NMHSs carry out a continental-wide survey on the capacities and capabilities of NMHSs and RCCs, including observing networks (land, water and space); telecommunications infrastructure for data exchange; data processing, analysis and forecasting tools; climate data management tools; product and information dissemination systems; including human capacity (skills and competency)
- Designate, equip and support centres in Africa that can assemble AWSs and/or fabricate basic meteorological instrument to improve observing network at a cheaper cost
- Operationalize the WMO implementation plans related to the WMO Integrated Global Observing System (WIGOS) and the WMO Information System (WIS), Global Climate Observing System (GCOS), and Global Ocean Observing System (GOOS) for RA I in accordance with Resolution 8 (RA I – 16).

Expected Result 6: *Enhanced capabilities of NMHSs to contribute to and draw benefits from the global research capacity for weather, climate, water and the related environmental science and technology development in order to mainstream climate services into national economic planning and programmes through the implementation*

KO 6.1	Research in regional climate modeling and prediction/projection to improve the skills of seasonal, decadal and longer timescales is enhanced using both statistical and dynamical	KPI 6.1.1	Number of new activities advancing climate research capacity at the regional and national levels, especially for early career scientists and scientists from developing and LDC countries
		KPI 6.1.2	Number of early career scientists and scientists from developing and least developed countries that WCRP funded to participate in activities to advance climate research

	methodologies	KPI 6.1.3	Degree of satisfaction among NMHSs with the skill of climate predictions
KO 6.2	Research in the prediction of high-impact weather on time scales of hours to seasons is enhanced	KPI 6.2.1	Number of total research projects (new, ongoing and completed) on operational products and services
		KPI 6.2.2	Number of Members whose operational products and services have improved as a result of WMO research projects
		KPI 6.2.3	Number of NMHSs in developing and least developed countries participating in regional and international research initiatives on high impact weather or severe weather forecasting demonstration projects
KO 6.3	Observations and assessment of atmospheric chemical composition to meet needs of environmental conventions and policy assessments. In addition, research in physics and chemistry of clouds and weather modification as a means to climate change adaptation	KPI 6.3.1	Degree of Member satisfaction with the: (a) usefulness; and (b) timeliness of Global Atmospheric Chemistry Bulletins
		KPI 6.3.2	Degree of Member satisfaction with the usefulness of: (a) GAW measurement guidelines and reports; (b) Sand-and-Dust storm forecasting; and (c) the chemical weather activities of GURME
KO 6.4	Seamless forecasts of weather, climate, water and the environment from days to seasons are developed in support of the GFCS	KPI 6.4.1	Number of NMHSs participating in the integration of observations, research, modelling and analysis results to improve sub-seasonal to seasonal weather/climate projections and predictions

Activities

- Support WMO to develop the Sub-seasonal to Seasonal Prediction Research Project (S2S) and the High Impact Weather Research Project (HIW) in the Region.
- Encourage NMHSs to establish collaboration with universities in the Region and improve the interaction between Universities/Research Institutes and NMHSs
- Work with WMO and climate scientists on the Climate Research for Development (CR4D) initiative to prepare scientific studies on the impact of intra-seasonal variability on high-impact weather events to predict these extreme events in the Region

- Encourage WMO specialised training programme in Africa on ensemble forecasting for better understanding and use of these forecasts in improving forecast performance
- Support activities towards an integrated research related to Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS), forecast verification and subseasonal to seasonal prediction into operational applications

Expected Result 7: *Enhanced capabilities of NMHSs in Developing Countries, and particularly in the Least Developed Countries and Small Island Developing States, to fulfil their mandates*

KO 7.1	Visibility and relevance of NMHSs in national and regional development agendas is improved, particularly in developing and least developed countries	KPI 7.1.1	Number of NMHSs with: (a) increased contribution to national policy setting; (b) improved awareness by users on types of services NMHSs can deliver; (c) improved user accessibility to forecasts and warnings; (d) improved timeliness of forecasts and warnings; and (e) increased accuracy of forecasts and warnings
		KPI 7.1.2	Number of NMHSs with: (a) increased contribution to regional policy setting; (b) improved awareness by regional users on types of services that can be provided by the Regional Centre; (c) improved regional user accessibility to forecasts and warnings; (d) improved timeliness of forecasts and warnings delivered from the Regional Centre; and (e) increased accuracy of forecasts and warnings delivered from the Regional Centre
KO 7.2	Infrastructure and operational facilities of NMHSs and Regional Centres are improved, particularly in developing and least developed countries	KPI 7.2.1	Number of NMHSs with improved infrastructure and operational facilities
KO 7.3	Education and training development facilities at national and regional levels are improved, especially in developing and least developed countries	KPI 7.3.1	Number of institutions providing education and training support for GFCS related activities
		KPI 7.3.2	Degree to which Members are getting value for money from the WMO Fellowship Programme
		KPI 7.3.3	Degree of Member satisfaction with the Regional Training Centres (RTCs) in use

KO 7.4	Capacities of NMHSs are enhanced through cooperation and partnerships with other national and regional organizations	KPI 7.4.1	Development projects and activities funded through voluntary contributions
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Activities

- Carry out a continental-wide survey to assess NMHSs and RCCs current capability to produce and effectively disseminate customer tailored products and services and to engage with users to enhance these products and services
- Identify and mobilize resources for the necessary improvement of meteorological infrastructure and services, including human capacity development to deliver customer tailored services
- Build the capacity and capability of NMHSs to support Climate Services Information Systems (CSIS) and User Interface Platforms (UIP) of the GFCS
- Develop a schedule with the required actions / milestones for the establishment and designation of WMO RCCs in Africa
- Support the capacity of appropriate Regional Training Centres to offer appropriate trainings in all aspect of the operations to NMHSs
- Develop gender mainstreaming in meteorology and climate change programmes, in conformity with UN resolution on Gender equality and in collaboration with communication / Media experts in order to enhance the resilience of communities to cope with adverse impacts of climate change through disaster risk reduction initiatives including adaptation and mitigation options
- Ensure the implementation of the six strategic objectives of WMO Capacity Development Strategy (CDS) in line with Resolution 12 (RA I – 16) in Africa and Least Developed Countries
- Enhance the capacity development in the Region taking into account the needs in the RA I survey on institutional arrangements for NMHSs
- Ensure that all WMO’s scientific and technical programmes continue to give higher and visible priority to LDCs and SIDS in their assistance and capacity-development activities.
- Work with the WMO Education and Training Office to ensure that RA I members benefit from the WMO Global Campus initiative
- Enhance observation capabilities of NMHSs by introducing state of the art Doppler weather surveillance radars network.
- Maintain and enhance capabilities of NMHSs and RCCs to access existing satellite data and products (including those from the EUMETSAT Satellite Application Facilities – SAF)

and to develop added-value satellite derived products based on existing and future satellite programmes

Expected Result 8: <i>New and strengthened partnerships and cooperation activities to improve NMHSs' performance in delivering services and to demonstrate the value of WMO and AMCOMET contributions within the Region, relevant regional organizations, international conventions and national strategies</i>			
KO 8.1	RA I leadership and contribution to WMO, AMCOMET and other UN system and international partners' initiatives and programmes are improved	KPI 8.1.1	Number of reports of RA I and its sponsored programmes submitted to WMO and other international conventions, particularly the UNFCCC, UNCCD and UNCBD
		KPI 8.1.2	Number of contracts/cooperation agreements which AMCOMET is engaged with partners
		KPI 8.1.3	Number of NMHSs implementing projects with the UN and other international and/or regional organizations
KO 8.2	Public, decision-makers and other stakeholders are increasingly aware of key AMCOMET and NMHSs issues, activities and priorities through enhanced communication	KPI 8.2.1	Uptake of WMO public information outputs as measured by: (a) number of unique visitors on the WMO and AMCOMET websites; (b) number of visits to the portals (c) number of times WMO and AMCOMET was mentioned in press articles
		KPI 8.2.2	Degree to which NMHSs make use of WMO public information outputs
		KPI 8.2.3	Number of NMHSs that have provided training to senior managers and/or communication officers in media relations, social media or other aspects of communication
KO 8.3	MoUs, programme implementation agreements to facilitate implementation of projects and programmes in partnership with relevant institutions are signed by AMCOMET, RCCs and NMHSs	KPI 8.3.1	Number of MoUs, agreements on AMCOMET signed at different levels
		KPI 8.3.2	Number of collaborative implementation reports

Activities

- Establish stronger collaboration with the various intergovernmental bodies (e.g. RECs) in Africa through their regional meetings
- Enhance the partnership between NMHSs and RA I

- Downscale the Implementation and Resource Mobilization Plan of the Strategy, and cascade it at the sub-regional and national levels to foster closer collaboration and working relations between stakeholders
- Establish AU and other Regions/Countries Partnerships on Meteorology (Weather and Climate Services).
- Design and Develop a web portal, as a node and ensure that weather and climate services information is readily available and friendly accessible to all stakeholders

Expected Result 9: <i>Established funding mechanism, including donor support programmes at national and continental scale aimed at developing and strengthening capacity of NMHSs in the production and delivery of services</i>			
KO 9.1	Funding mechanisms at regional or national levels to support infrastructure for RCCs are developed in addition international funding mechanism, through partnership and agreements between donors on coordination of activities at regional levels to accessed	KPI 9.1.1	Number of NMHSs & RCCs adequately supported by regional funding
		KPI 9.1.2	Number of donors-supported projects and programmes
		KPI 9.1.3	Total amount of funding received
KO 9.2	Funding mechanisms at national level, through government commitment, to support basic meteorological infrastructure that generates basic services for Public Good are developed, including countries that fabricate basic meteorological equipment are identified	KPI 9.2.1	Number of NMHSs adequately supported by national funding
		KPI 9.2.2	Number of donors-supported projects and programmes in NMHSs
		KPI 9.2.3	Total amount of funding received nationally
		KPI 9.2.4	Number of countries fabricating basic instrument in the Region

Activities

- Prepare and organize Development Partner Round Tables to support implementation plan and/or create a weather and climate facility as well as improve information exchange between countries and development partners
- Develop National Strategic Plans (NSPs) capturing country priorities to attract national governments to commit themselves through budgetary allocations to support the infrastructure of the NMHSs to produce basic public good services
- Mobilize institutional funding to invest in NMHSs to further modernize and improve service delivery in tailor made products for different clientele
- Designate, equip and support sub-regional centres in Africa that can assemble or fabricate basic meteorological instrument to improve observing network at a cheaper cost

- Enhance partnerships with bilateral and multi-lateral development institutions to mobilize resources
- Develop and submit project proposals for modernizing NMHSs and enhancing capacity development, especially in Least Developed Countries (LDCs) and Land-locked Developing Countries (LLDCs) to Development Partners

Expected Result 10: *An efficient and effective management of NMHSs, RCCs and RA I sessions*

KO 10.1	Effective and efficient NMHSs, RCCs and Regional Association sessions	KPI 10.1.1	Degree of Member satisfaction with documentation for RA I sessions, Working Groups, Task Teams and Committees meetings
		KPI 10.1.2	Degree of Member satisfaction with supporting services for RA I sessions and constituent bodies (interpretation, conference activities and facilities)
		KPI 10.1.3	Decrease in the total cost of sessions held under similar conditions
KO 10.2	An effective and efficient RA I and NMHSs	KPI 10.2.1	Percentage of implemented accepted oversight recommendations for improved business effectiveness on the agreed deadline
		KPI 10.2.2	Number of training sessions and/or managers trained on strategic leadership, management and communication skills
		KPI 10.2.3	Increase in the efficiency of fulfilling requirements for linguistic and publishing services
		KPI 10.2.4	Number of training sessions and/or number of personnel trained in project proposal formulation, strategic planning, writing and implementation
KO 10.3	Effective and efficient constituent bodies of RA I (WGs and TTs)	KO 10.3.1	Degree of Member satisfaction with constituent body documentation
		KO 10.3.2	Degree of Members satisfaction with constituent body supporting services (interpretation, conference services and facilities)
		KO 10.3.3	Decrease in the total cost of constituent body sessions held under similar conditions
KO 10.4	Gender equity across	KO 10.3.1	Proportion of men/women in WMO and RA I constituent bodies

	WMO and RA I	KO 10.3.2	Number of men/women granted WMO fellowships/number of total candidates
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Activities

- Prepare and conduct training in strategic leadership and management, including communication, for heads of NMHS and RCCs
- Support human capacity development at NMHSs and RCCs to develop Strategic Plans and related Action Plans
- Hold workshops in strategic leadership for managers of NMHSs, which include training in Result Based Management (RBM) and budgeting
- Support the training of NMHSs and RCCs to improve communications skills
- Support the training of NMHS and RCC personnel in project proposal formulation, writing and implementation
- Organize working visits and study tours to advanced weather and climate centres to learn best practices

<i>Expected Result 11: Enhanced visibility and relevance of the NMHSs and Regional Climate Centres (RCCs) with well formulated legislation or legal frameworks, institutional frameworks and relevant policies, thereby contributing to sustainable development at the national, sub-regional and continental levels</i>			
KO 11.1	Relevance of NMHSs and RCCs is regularly demonstrated and profile raised; and policy makers are sensitized and regularly informed	KPI 11.1.1	Number of NMHS and RCCs with outreach programmes (i.e. Public Weather Services) and/or dissemination strategies developed
		KPI 11.1.2	Number of workshops targeting relevant stakeholders, including policy makers, conducted
KO 11.2	Communication materials that showcase successful projects highlighting impact / benefits developed and disseminated and communication strategies developed to enhance the visibility of NMHSs	KPI 11.2.1	Number of countries with communication materials for public education and awareness campaigns
		KPI 11.2.2	Number of NMHSs and RCCs annually providing the Declaration of "Status of Climate"

Activities

- Enhance Public Awareness and Education through outreach programmes to the users, policy / decision makers, the public and other stakeholders
- Develop a Service Delivery Strategy and Communications Strategy for the dissemination of weather and climate information to stakeholders, in collaboration with

the media (TV, Radio, etc.), as a component of the NMHS Strategic Plan

- Organize workshops for the sensitization of relevant stakeholders, including policy makers, to enhance the understanding and use of weather and climate services for safety of life, protection of property, conservation of the environment, and adaptation to build resilient communities to cope with climate extremes occasioned by adverse climate change impacts
- Prepare and provide policy makers, including parliamentarians and relevant line ministries in governments, with timely, relevant and well packaged information related to:
 - *Impact-based weather and climate forecasts with quantified impacts on the society and weather and climate dependent productive sectors*
 - *Develop Annual Reports on the Status of Climate - Provide annual summary of pertinent activities and events related to weather and climate*
 - *Indicate annual investment plan and budget for their attention and support*

IV.2 REGIONAL ASSOCIATION II (ASIA)

DEPT	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PRORGRAMME	TC	REGION	ACTIVITY	Y2016	Y2017	Y2018	Y2019
DRA	1	1.1	1.1.1	Monitoring of and improvement in the provision measures for the ERA products and services	WWW, ERA	CBS	RA II	Continue email / fax tests to improve reachability for the registered NMHSs	x	x	x	x
DRA	1	1.1.	1.1.1	Enhanced communication with ET-ERA through the provision of Members' requirements	WWW, ERA	CBS	RA II	(a) Carry out a user request survey (b) Convey appropriate requests from Members to CBS ET- ERA	x	x		
DRA	1	1.1	1.1.1	Enhanced Members' understanding on ERA	WWW, ERA	CBS	RA II	Provide Members with a concise guidance for the transition to the new GDPFS manual regarding EER			x	x
DRA	1	1.2	1.2.1	Improvement or delegation of responsibilities on issuance of SIGMET	WWW, AeMP	CBS, CAeM	RA II	(a) Provide support and/or conduct expert visit to Members in need, as necessary (b) Carry out a survey on the status of implementation and planning in each Member	x			x
DRA	1	1.2	1.2.1	Provision of improved aeronautical meteorological services to Air Traffic Management (ATM)	AeMP	CAeM	RA II	(a) Encourage Members' dialogue with ATM users and implementation of MET services in support of ATM operations (b) Provision of guidance material and advice to Members (c) Carry out an annual survey on current status of the implementation and planning of MET support to ATM in each Member (d) Conjoint work with relevant ICAO and WMO groups, such as ICAO APAC MET/R TF, WMO ET-ISA (e) Introduce examples of best practices and present regional status and practices of MET support to ATM	x	x	x	x

DEPT	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PRORGRAMME	TC	REGION	ACTIVITY	Y20 16	Y20 17	Y20 18	Y20 19
DRA	1	1.2	1.2.1	Implementation of WMO-No. 49 requirements for aeronautical meteorological personnel (Enhanced awareness of Members on Competency Assessment)	WWW, AeMP, ETRP	CBS, CAeM	RA II	(a) Facilitate assistance from regional resource persons through twinning, etc. (b) Include a topic on AeM in Regional Seminar or emerging issues of RA II-15 to discuss the issue in depth	x	x		
DRA	1	1.2	1.2.1	Implementation of QMS for AeM Service Providers (AEMSP)	WWW, AeMP	CBS, CAeM	RA II	(a) Share the experience and lessons learned with focal points for QMS (from IR of Iran, Oman and Qatar) (b) Promote and coordinate twinning assistance between Members in RA II in cooperation with CAeM TT-QMS	x	x	x	x
DRA	1	1.2	1.2.1	Increased accuracy, timeliness and usefulness of tropical cyclone forecasts and warnings	WWW, DPFS, TCP	CBS	RA II	(a) Training on operational tropical cyclone forecasts and warnings (b) Training on medium-range forecasts and warnings (c) Training on the use of Ensemble Prediction System (EPS) and consensus technique for tropical cyclone forecasting	x	x	x	x
DRA	1	1.2	1.2.1	Promotion of the implementation of the "Competency Framework for PWS Forecasters and Advisors" in the Region	ETRP, PWSP	CBS	RA II	(a) Implement the "Competency Framework for PWS Forecasters and Advisors" in the Region (b) Provide training and technical support to flash flood and urban flood forecasting for operational nowcasting (0-6 hours ahead) service on high-impact weather (c) Training on short-range forecasts and warnings (6-24 hours ahead)		x	x	x
DRA	1	1.2	1.2.1	Participation in PWS capacity development activities	ETRP, PWSP	CBS	RA II	(a) Conduct a training on PWS (b) Conduct a training in Communications (c) Conduct a training on interpretation of radar/satellite information for improved nowcasting		x	x	x
DRA	2	2.1	2.1.1	Implemented WMO	ETRP,	CBS	RA II	Conduct a workshop—on impact-		x	x	x

DEPT	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PRORGRAM ME	TC	REGION	ACTIVITY	Y20 16	Y20 17	Y20 18	Y20 19
				Guidelines on Multi-hazard Impact-Based Forecast and Warning Services in the preparation in moving towards impact-based forecasts practices in the NMHSs	PWSP			based forecast and warning for NMHSs and users				
DRA	2	2.1	2.1.1	Enhanced communication with Members	PWSP	CBS	RA II	Annually update the list of PWS focal point, PWS technical contact and alerting authorities of Members, as well as their progress on PWS activities such as CAP implementation status		x	x	x
DRA	2	2.1	2.1.1	Enhanced capability of socio-economic benefit study	ETRP, PWSP	CBS	RA II	Organize workshop on socio-economic benefit study for Members in RA II or subregions		x	x	x
DRA	2	2.1	2.1.1	Enhanced capability of severe weather forecasting and warning services through SWFDP	WWW, DPFS	CBS, CAS	RA II	(a) Implement regional and national components of Severe Weather Forecasting Demonstration Project, in particular SWFDP-Southeast Asia, SWFDP-Central Asia and SWFDP-Bay of Bengal (b) Increase awareness of SWFDP and utilization by NMHS	x	x	x	x
DRA	3	3.1	3.1.1	Enhanced capability of the use of NWP, including EPS, products provided by RSMCs and advanced NWP centres	WWW, DPFS	CBS	RA II	(a) Identify the focal point of GDPFS and update annually; (b) Encourage NMCs to submit WMO Technical Progress Report on GDPFS and NWP research and analyze GDPFS status in RA II from these reports. (c) Collect Members' needs on NWP, including EPS, products (d) collect and share information on available resources and services provided by Members	x	x	x	x
DRA	5	5.4	5.4.1	Enhanced capability on sand and dust monitoring and forecasting	WWRP, GAW, DPFS	CAS, CBS	RA II	(a) Enhance the ability of partner research experts to deliver timely and quality forecasts of sand and dust storms under the WMO Sand and Dust Storm Warning Advisory	x	x	x	x

DEPT	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAMME	TC	REGION	ACTIVITY	Y2016	Y2017	Y2018	Y2019
								<p>and Assessment System (SDS-WAS)</p> <p>(b) Organize training on interpretation of sand and dust storm output from the SDS-WAS Asian Node (hosted by China), including how to access data and information</p> <p>(c) Examine data policies and exchange observational sand and dust data</p> <p>(d) Enhance the quality check and conduct intercomparison</p>				

DEPT	BRANCH	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PRORGRAMME	TC	REGION	ACTIVITY	Y2016	Y2017	Y2018	Y2019
DRA	RAP	1	1.2	1.2.1	Enhanced capability in using climate services operationally for farmers	WCP, AgMP	CAGM	RA II	Conduct workshops and training courses for Members in developing countries or least developed countries	x	x	x	x
DRA	RAP	3	3.2	3.2.2	Enhanced capability in providing climate prediction services to meet users' requirements	WCP, DPFS	CCI, CBS	RA II	(a) Further establish sub-regional Regional Climate Outlook Forums (RCOFs) (b) Enhance exchange and training on monthly/seasonal climate prediction including ENSO, IOD, monsoon and MJO predictions	x	x	x	x
DRA	RAP	3	3.2	3.2.4	Enhanced services of the Regional Climate Centres (RCCs)	WCP, DPFS	CCI, CBS	RA II	(a) Improve RCC products to meet Members' requirements; (b) Facilitate candidate RCCs to demonstrate the capabilities and move on to designation process	x	x	x	x
DRA	RAP	4	4.4	4.4.1	Improved observations for climate services	WCP, GCOS, WWW	CCI, CBS	RA II	(a) Enhance training on the maintenance of metadata records based on Climate Data Management System (CDMS); (b) Render assistance to NMHSs for Data	x	x	x	x

DEPT	BRANCH	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PRORGAMME	TC	REGION	ACTIVITY	Y2016	Y2017	Y2018	Y2019
									Rescue (DARE) projects				
DRA	RAP	1	1.2	1.2.1	Enhanced capability of Socio-economic impacts of weather and climate extremes on Agriculture	WCP, AgMP	CAGM	RA II	Organize workshop on socio-economic impacts of Weather and Climate extremes for Members in RA II or subregions	x	x	x	x

DEPT	BRANCH	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAM ME	TC	REGIO N	ACTIVITY	Y2016	Y2017	Y2018	Y2019
DRA	RAP	2	2.2	2.2.1	Improvement in hydrological warnings capability through enhanced and effective cooperation with other NMHSs	WWW, HWRP, DRR	CBS, CHy	RA II	(a) Prepare recommendations on the use of NWP outputs in flood forecasts; (b) Document approaches to ascertain the deterministic error of each ensemble element of NWP products; (c) Use WMO Flood Forecasting Initiative as platform		x	x	x
DRA	RAP	3	3.3	3.3.1	Improvement in adaptation capacity of water resources systems in a changing climate	WWW, HWRP, WCP	CBS, CHy, CCI	RA II	(a) Assess changes in climate extremes - Data and method of climate extreme study: data inventory, climate index - Trend of some climate extremes: temperature, rainfall and others (b) Translate climate and climate change information into actions in water resources development and management	x	x	x	x
DRA	RAP	3	2.1	2.1.1	Improvement in capacity for water-	WWW, HWRP,	CBS, CHy	RA II	(a) Organize a workshop on the		x	x	x

DEPT	BRANCH	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAM ME	TC	REGIO N	ACTIVITY	Y2016	Y2017	Y2018	Y2019
					related disaster management (Hydrological extremes)	DRR			provision of input and support to disaster management (b) Attend seminars on sediment disasters in order to communicate and cooperate among member countries				
DRA	RAP	3	3.3	3.3.1	Improvement in hydrometric measurements with quality and accuracy	WWW, HWRP	CBS, CHy, CIMO	RA II	Provide guidance on the use of appropriate instrumentation and methods of observation in diverse conditions		x	x	x
DRA	RAP	2	2.2	2.2.1	Issuance of flood, flash and urban flood warnings and constantly improving upon them	WWW, HWRP, DRR	CBS, CHy	RA II	(a) Document experiences in the use of the Central Asia Region Flash Flood Guidance System (FFGS) in participating countries by reviewing its use (b) Facilitate FFGS understanding by operational hydrologists in the Region (c) Develop recommendations on the use of hydrological forecasts in flood management	x	x	x	x

DEPT	BRANCH	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAM ME	TC	REGIO N	ACTIVITY	Y2016	Y2017	Y2018	Y2019
DRA	RAP	2	2.1	2.1.1	Issuance of landslide/debris flow warnings and constantly improving upon them	WWW, HWRP, DRR	CBS, CHy	RA II	Collect and disseminate guidance materials and manuals on the assessment of rainfall/flood induced mass movement hazards and potential forecast methodologies		x	x	x
DRA	RAP	3	3.3	3.3.1	Development of national and regional capacity building programmes and related training activities for hydrological services	HWRP	CHy	RA II	Synthesize report from individual reports from participating countries in RA II on national and regional capacity development activities in hydrology and make recommendations on their enhancement		x	x	x
DRA	RAP	4	4.1	4.1.1	Update of Regional WIGOS Implementation Plan (RWIP)	WWW	CBS	RA II	Encourage the Task Team on Regional WIP for updating RWIP			X	X
DRA	RAP	4	4.1	4.1.1	Pre-operation of WIGOS in region II	WWW	CBS	RA II	(a) Establish a task team to analyze the main requirement of pre-operation of WIGOS and challenges for pre-operation of WIGOS in RA II; (b) Develop a guidance to pre-operation of WIGOS in Region II for	X	X	X	X

DEPT	BRANCH	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAM ME	TC	REGIO N	ACTIVITY	Y2016	Y2017	Y2018	Y2019
									Members; (c) Encourage Members to finalize the national WIGOS implementation plan.				
DRA	RAP	4	4.1	4.1.2	Regular maintenance and calibration of observation instruments, and implementation of reliability measures on quality management routines and procedures of weather observations	IMOP, WWW	CIMO , CBS	RA II	Implement the RA II WIGOS Project to enhance the availability and quality management support for NMHSs in surface, climate and upper-air observations	X	X	X	X
DRA	RAP	4	4.1	4.1.2	Maintenance and enhancement of the measuring stations in the Region	WWW, WCP, MMOP	CBS, CCI, JCOM M	RA II	(a) Collect and share standard and best practices documents from RA II Members; (b) Encourage the collection of metadata on observing systems; (c) Support standard of Regional Instrument Centre (RIC)	X	X	X	X
DRA	RAP	4	4.1	4.1.2	Implementation of Implementation Plan for the Evolution of Global Observing Systems (EGOS-IP)	WWW	CBS	RA II	(a) Encourage Members to develop national reports on progress of Implementation Plan for the Evolution of	X	X	X	X

DEPT	BRANCH	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAM ME	TC	REGIO N	ACTIVITY	Y2016	Y2017	Y2018	Y2019
									Global Observing Systems (EGOS-IP); (b) Make gap analysis of observing network in RA II on the basis of users' requirements and existing observing network.				
DRA	RAP	4	4.1	4.1.2	Development of Regional Basic Observing Network of RA II (RBON-II)	WWW	CBS	RA II	(a) Survey the comprehensive review of all existing observing systems in the Region; (b) Hold a workshop to develop a concept of RBON-II; (c) Develop the RBON-II by a task team and submit to the RA II session.	X	X	X	X
DRA	RAP	4	4.1	4.1.2	Development and implementation of the WIGOS data quality monitoring system	IMOP, WWW	CIMO , CBS	RA II	(a) Implement the WIGOS Project to enhance the availability and quality management support for NMHSs; (b) Organize RIC training workshops to ensure the accuracy of the instruments	X	X	X	X
DRA	RAP	4	4.1	4.1.2	Integration of Observing Systems for supporting Disaster Risk Reduction and aviation services	WWW	CBS	RA II	(a) Develop integrated weather radar product for severe weather monitoring at the sub-regional level;	X	X	X	X

DEPT	BRANCH	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAM ME	TC	REGIO N	ACTIVITY	Y2016	Y2017	Y2018	Y2019
									(b) Develop integrated surface-based and space-based operational products				
DRA	RAP	4	4.1	4.1.2	Maintenance/enhancement of operational weather radar stations in the Region	WWW	CBS	RA II (joint with RA V)	(a) Improvement of data quality of existing radars; (b) Development and expansion of national radar networks; (c) Near real time international exchange of radar data; (d) Development of "sub-regional" radar data centre(s).	X	X	X	X
DRA	RAP	4	4.1	4.1.2	Maintenance/enhancement of ground station(s) in the Region to receive high-resolution images from geostationary meteorological satellites	WWW, SP	CBS	RA II	(a) Continue implementation of the RA II WIGOS Project to develop support for NMHSs in satellite data, products and training; (b) Encourage and facilitate exchange and training on relevant know-how.	X	X	X	X
DRA	RAP	4	4.1	4.1.2	Growth in spatial and temporal coverage of hydrological observation networks	HWR, WWW	CHY, CBS	RA II	Encourage Members to maintain stations with long hydrological records for climate services.	X	X	X	X

DEPT	BRANCH	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAM ME	TC	REGIO N	ACTIVITY	Y2016	Y2017	Y2018	Y2019
DRA	RAP	4	4.2	4.2.1	Update Regional WIS implementation plan	WWW	CBS	RA II	(a) Mobilize experts of "Local Secondment" for updating of Regional WIS Implementation Plan; (b) Continue identification of WIS requirements of Members; (c) Organize training, WIS experts' visit for WIS implementation.	X	X	X	X
DRA	RAP	4	4.2	4.2.1	Implementation of GISCs, DCPCs and NCs	WWW	CBS	RA II	(a) Demonstrate capabilities of GISCs and DCPCs; (b) Produce regional information documents on WIS; (c) Organize a regional and national workshop for potential DCPCs and NCs.	X	X	X	X
DRA	RAP	4	4.2	4.2.1	Assessment of the implementation of WIS	WWW	CBS	RA II	Carry out a survey to monitor the status of WIS Centres and Area Meteorological Data Communication Networks (AMDCN) development/implementation.	X	X	X	X
DRA	RAP	4	4.2	4.2.1	Development WIS application Pilot Project	WWW	CBS	RA II	(a) Develop and evaluate new WIS applications; (b) Provide evaluated techniques and	X	X	X	X

DEPT	BRANCH	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAM ME	TC	REGIO N	ACTIVITY	Y2016	Y2017	Y2018	Y2019
									applications to operational WIS centers.				
DRA	RAP	4	4.2	4.2.1	Solution of isolated NMCs from the GTS	WWW	CBS	RA II	(a) Encourage and facilitate exchange on relevant know-how; (b) Render assistance to NMCs Baghdad and Kabul.	X	X	X	X
DRA	RAP	4	4.2	4.2.2	Connection to the Internet by broadband VPN	WWW	CBS	RA II	Provide assistance to NMCs.	X	X	X	X
DRA	RAP	4	4.2	4.2.2	Shift from the costly radio facsimile broadcast of meteorological and oceanographic information in chart form to more economical modern communication means	WWW	CBS	RA II	(a) Encourage and facilitate exchange on relevant know-how; (b) Render assistance if needed to Members who wish to involve the operators and users in modernizing the service.	X	X	X	X
DRA	RAP	4	4.2	4.2.2	Improvement of the Regional Meteorological Telecommunication Network (RMTN) to meet the minimum required bandwidth of 128 kbps	WWW	CBS	RA II	(a) Encourage the migration from analogue to digital circuits in the Middle-East and Central Asia; (b) Continue annual survey in the RMTN status.	X	X	X	X
DRA	RAP	4	4.2	4.2.2	Data catalogue implementation by DCPCs and NCs	WWW	CBS	RA II	(a) Review and complement the initial catalogue for DCPCs and NCs; (b) Develop a system to update data	X	X	X	X

DEPT	BRANCH	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAM ME	TC	REGIO N	ACTIVITY	Y2016	Y2017	Y2018	Y2019
									catalogue with relevant centres.				
DRA	RAP	4	4.2	4.2.2	Validation checking and Maintaining Data catalogue in the area of responsibility by the related GISC(s)	WWW	CBS	RA II	Review and check the updated data catalogue to maintain its reliability in the area of responsibility.	X	X	X	X
DRA	RAP	1	1.2	1.2.1	Enhancement of socio-economic benefits (SEB) of weather, climate and water services (Assessment of SEB of weather, climate and water services)	WWW, PWSP	CBS	RA II	(a) Implement the socio-economic studies and evaluations at regional level based on the recommendation of the book on methodologies for assessing SEB being prepared by WMO in collaboration with the World Bank	X	X	X	
									(b)Develop a web-based SEB guidance platform	X	X		
									(c) Examine and facilitate the exchange of data between the regional Members	X	X		
DRA	RAP	7	7.1	7.1.3	Enhancement of joint activities with partner organizations for utilization of meteorological information to be	WCP, RP	CCI	RA II	Joint Workshop in the field of health, water, food, energy, etc., with partner organizations			X	

DEPT	BRANCH	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAM ME	TC	REGIO N	ACTIVITY	Y2016	Y2017	Y2018	Y2019
					used as the guidance for decision making in national level								
DRA	RAP	7	7.2	7.2.1	Enhancement of visibility of activities and priorities of NMHS and communication with stakeholders and with regional organizations	PWSP	CBS	RA II	(a) Implementation of recommendations at regional level given by the guideline on communication with stakeholders including academia and regional organizations being prepared by WMO CBS/OPAG-PWS ET/COPE		X	X	
									(b) Training on relevant know-how		X		X

IV.3 REGIONAL ASSOCIATION III (SOUTH AMERICA)

Operating Plan (2016-2019) for the improvement of National Meteorological and Hydrological Services in WMO Region III

The Operating Plan (OP) of the WMO Regional Association III (RA III), for the period 2016-2019, is based on the following reference documents:

- WMO Strategic Plan 2016-2019;
- RA III Implementation Plan of the WMO Information System (WIS);
- RA III Implementation Plan of the WMO Integrated Global Observing System (WIGOS);
- Final report and documents of the sixteenth session of the Regional Association III (Asuncion, Paraguay 15-20 September 2014).

This OP is intended to guide the actions of RA III through its working groups, to contribute to the implementation of the key priorities of the WMO Strategic Plan in the Region.

Therefore, among the seven High Priorities of the WMO Strategic Plan 2016-2019, the following are considered fundamental for RA III:

- (1) WMO Integrated Global Observing System (WIGOS) and the WMO Information System (WIS);
- (2) Disaster Risk Reduction (DRR) Impact-based Forecasts and multi-hazard Early Warnings;
- (3) Capacity Development of NMHSs;
- (4) Global Framework for Climate Services (GFCS).

In this context, it is planned to strengthen the existing Regional Climate Centres (RCCs) for the western-South America (CRC-OSA) and for the southern-South America (CRC-SSA), and also create a third Regional Climate Centre for the Northeastern-South America (CRC-NSA). This OP seeks to achieve the RCCs have the ability to provide climate services that meet the requirements and needs of users and, at the same time, supply to decision makers sensitive information about climatic events of high societal and economic costs.

To that end, conventional and automatic observation networks, as well as communication systems existing in RA III, will be the subject of a detailed study and follow-up. The potential evolution of specialized personnel in each NMHS in the region will be assessed and evaluated.

The meteorological services for aviation will also be reviewed during this period, taking into account the current requirements of knowledge, qualifications and certifications, in addition to the quality certifications required by ICAO. These requirements might apply to marine meteorological services in the future.

The Operating Plan of RA III was made on the basis of the results of the Conferences of working groups (WGs) conducted simultaneously and in parallel, from 5 to 9 October 2015 in Asuncion, Paraguay. The activities defined by each WG are reflected in the OP.

The activities to be developed by the Regional Association III, under the WMO Strategic Plan relevant key activities and its corresponding Expected Results, are described in the Table below.

Table
Activities of the RA III Operating Plan

Abbreviations:	
ER =	Expected Result
KPI=	Key Performance Indicators
RA III WG-ITD =	Regional Association III Working Group on Infrastructure and Technological Development
RA III WG-HWR =	Regional Association III Working Group on Hydrology and Water Resources.
RA III WG-CI =	Regional Association III Working Group on Climatology.
RA III MG =	Management Group of Regional Association III

WMO ER 1: Improved service quality and service delivery: Enhanced capabilities of Members to deliver and improve access to high-quality weather, climate, hydrological and related environmental predictions, information, warnings and services in response to users' needs and to enable their use in decision making by relevant societal sectors.					
RA III ER 1: Strengthened capacity to transform basic and processed data, as well as to provide integrated products and related services, to meet the needs of RA III Members to cope with extreme meteorological and hydrological events.					
Activities	Working Group responsible	Progress			
		2016	2017	2018	2019
ITD 1. WIGOS Implementation Plan.	WG-ITD				
ITD 2. WIS Implementation Plan.	WG-ITD				
ITD 4. Public services delivery.	WG-ITD				
HWR 1. Implementation of the WMO Hydrological Observing System	WG-HWR				

(WHOS)/ WaterML in the WIGOS- SAS (Southern South America) /CP(Cuenca del Plata).					
CI 1.2. Harmonization of data quality procedures and processing. Improvement of the efficiency of Regional Climate Centres (RCCs) operations	WG-CI				
CI 2.1. Enhancement of regional capacity in seasonal and sub-seasonal forecasting.	WG-CI				
CI 3.1. Promotion of National Climate Outlook Forums (NCOFs). Preparation of a Guide of mandatory practices for the development of NCOFs.	WG-CI				
WMO ER 2: Reduced disaster risk: Enhanced capabilities of Members to reduce risks and potential impacts of hazards caused by weather, climate, water and related environmental elements.					
RA III ER 2: Improved capabilities of RA III Members to provide forecasts based on impacts, and reduce risks caused by weather, climate and water related events.					
Activities	Working Group responsible	Progress			
		2016	2017	2018	2019
ITD 3. Weather, Climate and water-related forecasts and alerts on natural disasters	WG-ITD				
HWR 2. Coordination with the Commission for Hydrology (CHy) of WMO, with respect to activities related to flash floods including Zarumilla project.	WG-HWR				

HWR 3. Promotion of joint initiatives on Hydro-climatic forecasting with Regional Climate Centres (RCCs), the Commission for Hydrology (CHy) of WMO and the Intergovernmental Committee for the la Plata river basin (CIC).	WG-HWR				
HWR 5. Promotion of Integrated Flood Management activities.	WG-HWR				
HWR 6. Promotion of Early Warning System activities.	WG-HWR				
CI 4.1. Development of a Regional System for Drought Monitoring, applicable to the needs of each country in RA III.	WG-CI				
CI 4.2. Comprehensive assessment of climate change impact in agriculture, based on climate, crops and economic models in RA III.	WG-CI				
WMO ER 3: Improved data-processing, modelling and forecasting: Enhanced capabilities of Members to produce better weather, climate, water and related environmental information, predictions and warnings to support, in particular, reduced disaster risk and climate impact and adaptation strategies.					
RA III ER 3: Improved data-processing and dissemination through the enhancement of current means and the exploration of alternative mechanisms, in order to ensure the integrity of relevant observation networks, including climate data and hydrological products, timely and respecting the international principles established by WMO Resolution 40 (Cg-XII/1995) and Resolution 25 (Cg-XIII/1999) on free and unrestricted exchange of meteorological and hydrological data and products between Members.					
Activities	Working	Progress			

	Group responsible	2016	2017	2018	2019
CI Pr 2. Strengthen scientific research aimed at improving climate services.	WG-CI				
HWR 7. Development of work programs in new areas of interest: hydrological hazards monitoring, prediction and evaluation of sludge flows.	WG-HWR				
(ITD 3. Sub activity : numerical modelling, assembly, new assimilation techniques)	WG-ITD				
<p>WMO ER 4: Improved observations and data exchange: Enhanced capabilities of Members to access, develop, implement and use integrated and interoperable Earth- and space-based observation systems for weather, climate and hydrological observations, as well as related environmental and space weather observations, based on world standards set by WMO.</p> <p>RA III ER 4: Guaranteed availability of data relating to products and information required in real and deferred time, facilitating their access through the WIS, according to the needs identified.</p>					
Activities	Working Group responsible	Progress			
		2016	2017	2018	2019
CI 1.1 Historical data rescue.	WG-CI				
(WIGOS/WIS/WHOS implementation, as indicated in RA III ER 1)	WG-ITD				
<p>WMO ER 5: Advance targeted research: Enhanced capabilities of Members to contribute to and draw benefits from the global research capability for weather, climate, water and related environmental science and technology development.</p> <p>RA III ER 5: Improved scientific knowledge in RA III, to raise the level of</p>					

weather, climate and water services.					
Activities	Working Group responsible	Progress			
		2016	2017	2018	2019
Various activities, such as ITD 3, HWR 2, 7, CI 2.3	WG-ITD WG-HWR WG-CI				
WMO ER 6: Strengthened capacity development: Enhanced capabilities of Members' NMHSs, in particular in developing and least developed countries and small island developing States, to fulfil their mandates.					
RA III ER 6: Strengthened capacity of NMHSs in RA III, allowing them to work effectively with WMO, global and regional institutions, national governments and local authorities, to fulfill their mandates and achieve the common objectives of RA III.					
Activities	Working Group responsible	Progress			
		2016	2017	2018	2019
CI 5 Design of a training plan that will be implemented through the Regional Training Centres (RTCs) and Regional Climate Centres (RCCs) with materials on data management, forecasting, climate services and agrometeorology.	WG-CI				
ITD 5. Capacity development at regional level.	WG-ITD				
HWR 5. Promotion of Integrated Flood Management (IFM) (sub activity: workshops on IFM).	WG-HWR				

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

RA III ER 7: Awareness of regional or sub-regional institutions on the role and mission of NMHSs and strengthening linkages between NMHSs and relevant organizations in each case.

Activities	Working Group responsible	Progress			
		2016	2017	2018	2019
Implementation of the Regional Climate Centres (RCCs) mentioned above. Consider also the regional cooperation initiatives and other outreach activities with regional institutions.	WG-CI RA III MG				

WMO ER 8: Improved efficiency and effectiveness: Ensured effective functioning of policymaking and constituent bodies and oversight of the Organization.

RA III ER 8: Improved coordination in the process of decision making of RA III, through working groups and the Management Group.

Activities	Working Group responsible	Progress			
		2016	2017	2018	2019
CI 6. Interaction among WGs of RA III <i>(ER 8 activities are under the main responsibility of the Management Group of RA III).</i>	WG-CI RA III MG				

<p>HWR 8. Improve and optimize the WG-website to facilitate internal communication and present the results of the work.</p> <p><i>(ER 8 activities are under the main responsibility of the Management Group of RA III).</i></p>	<p>WG-HWR RA III MG</p>				
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IV.4 REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN)

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

RKO 1 Improved access to seamless weather, climate, water and related environmental products and services (for example, warnings, forecasts and supporting information)

Aviation Task Team

TAF Verification, expand US online individual TAF verification program to the entire region. <https://verification.nws.noaa.gov/> .The original TAF verification program for the Caribbean, via work done at the Caribbean Institute for Meteorology and Hydrology (CIMH) originated from the US, and is labor intensive.

2015-2017

\$60K US (TT priority #2)

Hurricane Committee

Implementation of Hurricane Forecasters competencies. The Hurricane Forecasters Competencies will have to be "rolled-out" and possibly adjusted to the needs of NMHSs. This would require training of personnel.

2016-2019

\$60K US

Hurricane Committee

Bi-annual training workshops (2017, and 2019)

2017: Training workshop for the demonstration project (i.e. including other countries in the demonstration). Focus on training for the new model being developed for Hispaniola, in including all RA-IV members.

2017

\$80K US

2019: Training workshop with focus on training geared toward building beyond the Hispaniola demonstration (i.e. taking the next step after Hispaniola demonstration).

2019

\$80K US

Develop a Severe Weather Demonstration Project for the Region possibly building on the DEWETRA (CIMH) and SHERPA (Météo-France) Projects

Expected Result 2 (Disaster Risk Reduction):

RKO 2.1: Ensure accessibility and effective delivery of useful products to meet the needs of the Region as related to meteorological and hydrological events
Implement and/or Improve Multi-hazard Early Warning Systems

<p>DRR Task Team</p> <ol style="list-style-type: none"> 1. Document lessons learned from MH-EWS project with emphasis on successful relationship with Emergency Managers 2. Review and promote the use of Standard Operating Procedure (SOPs) at national and community level by disseminating tailored training materials. 3. Provide advice for the development of MH-EWS activities and seek opportunities to fund related projects 4. Organize a regional workshop to assess the progress of MH-EWS implementation plan of the countries 5. Assist countries with their implementation plan and seek opportunities to fund related projects. 	<p>2014 – 2017 2016 2017 -2019</p>	<p>1. + 2. \$10K 3. \$10K (participation at funders meetings) 4. \$20K (2 day coordination TT DRR meeting) 5. \$150K</p>
<p>RKO 2.2: Improvement of Flood warnings</p>		
<p>Hydrology Working Group</p> <ol style="list-style-type: none"> 1. To compile experiences on the results of the application of the flood warning system and prepare a report of inter comparison of results. 2. Improvement of Flood Risk Analysis, Management and Forecasting: vulnerability and hazard detection, observation, forecasting, modeling, and communication of warnings 3. Technical Workshop on Flood Risk Analysis, Management and Forecasting (November 2019) 	<p>2016 – 2018 2018 - 2019 2019</p>	<p>This will be done through the Virtual Hydrology Forum. \$25K</p>
<p>Expected Result 3 (Forecast Systems): Enhanced capabilities of Members to produce better weather, climate, water and related environmental information, predictions and warnings to support in particular disaster risk reduction and climate impact and adaptation strategies</p> <p>RKO 3.1 Improvement of Climate information and prediction services</p>		
<p>GFCS Task Team</p> <ol style="list-style-type: none"> 1. Facilitate the implementation of regional activities by sharing best practices, building up regional capacity, strengthening regional collaboration. Funds would be used to support regional level actions that will enhance NMHS capacity and training, and stakeholder engagement. 	<p>2015-2019</p>	<p>\$80K</p>
<p>Aviation Task Team</p> <p>1) Conditional Climatology, expand the use of climatology to generate a better TAF based upon the TAF climatology program in place in the US; CIMH has field tested this application, Goal is to share with RA IV members States as a method to improve TAFs.</p>	<p>2015-2017</p>	<p>\$10K (TT priority #1)</p>
<p>RKO 3.2: Hydrological information and products, including water resource assessments, are improved</p>		

<p>Hydrology Working Group</p> <ol style="list-style-type: none"> 1. Building capacity: facilitate both the adaptation of existing courses and development of new training courses in hydrology and water resources assessment 2. Meeting of the WGH (Preparation for AR IV-17) and Technical Workshop on Hydrological Prediction and Forecasting. (November 2016) 3. To continue to work on the Assessment and Management of Hydrological Networks and Data 4. Meeting of the WGH (Monitoring and Evaluation) and Meeting of on the usage of regional climate model outputs in water resources assessment. (Nov 2018) 5. Support for regular working sessions of the Central American Hydrological Forum (in partnership with CRRH) 	<p>2016-2019</p> <p>2016</p> <p>2016-2019</p> <p>2018</p> <p>2016-2019</p>	<p>Virtual Hydrology Forum</p> <p>\$35K</p> <p>Virtual Hydrology Forum</p> <p>\$25K</p> <p>\$40K (\$10K per year)</p>
<p>Expected Result 4 (Monitoring Systems): Enhanced capabilities of Members to access, develop, implement and use integrated and interoperable surface-based and space-based observation systems for weather, climate and hydrological observations, as well as related environmental and space weather observations, based on world standards set by WMO</p> <p>RKO 4: Ensure the availability of required data, products and information and facilitates access through the WMO Information System (WIS) according to identified requirements</p>		
<p>WIS/WIGOS Task Team</p> <ol style="list-style-type: none"> 1. Create an inventory of the existing Regional Networks, including a process for its ongoing maintenance 2. Improve the availability and utilization of AWS data not already commonly shared, both existing and silent; 3. Develop real-time monitoring and reporting capability, to support operations 4. Develop a process to monitor and report on the level of regional compliance with WIGOS standards <p>Hydrology Working Group</p> <ol style="list-style-type: none"> 1. Propose and develop the second phase of Carib-HYCOS Project 	<p>2015 -2017</p> <p>2014-2019</p> <p>2015 - 2019</p> <p>2015 -2019</p> <p>2016-2019</p>	<p>\$10K</p> <p></p> <p></p> <p></p> <p>\$30K</p>
<p>Expected Result 5 (Advance Targeted Research): Enhanced capabilities of Members to contribute to and draw benefits from the global research capability for weather, climate, water and related environmental science and technology development</p>		
<p>Hydrology Working Group</p> <ol style="list-style-type: none"> 1. To continue sharing and adapting science and software advances for Hydrological Prediction and Forecasting 2. Establish a task team force for the preparation of a guidance material for using regional climate model outputs in water resources assessment and management 	<p>2016 - 2017</p> <p>2017</p>	<p>Virtual Hydrology Forum</p> <p>Virtual Hydrology Forum</p>
<p>Expected Result 6 (Capacity Building): Enhanced capabilities of NMHSs, in particular in developing and least developed countries, to fulfil their mandates</p>		
<p>Aviation Task Team</p> <p>1) Proposed Aviation Weather Center (AWC) International Training Desk, modeled after the South American Training Desk operated by NWS HPC.</p>	<p>2016-19</p>	<p>\$150K US per year. TT feel</p>

<p>The training will consist of a combination of computer based training, reading materials, classroom instruction and on the job experience. The travel and per diem costs of the students will be paid for by their origin country. Or some other external grant (WMO?) Possibility of 6-12 positions a year. POC Mike Graf and Matt Strahan</p> <p>Aviation Task Team 2) Workshop IN Mexico City for new SIGMET guidance and training material. Focused on Aviation specific areas, such as Volcanic Ash, Tropical SIGMET production. Hosted by the North American ICAO regional office</p> <p>Education and Training Focal Point</p> <p>1) Needs assessment/analysis to identify the current performance gaps within the forecaster organizations in Region IV. Focus on performance gaps in aviation and tropical forecasting. Determine the training needs and perhaps identify common needs across all countries in the Region.</p> <p>a) Planning: identify the target audience and the data gathering and analysis strategies to employ</p> <p>b) Data collection: prepare the survey and interview instruments and use them to collect data</p> <p>c) Data analysis: analyze the data and prioritizing the findings</p> <p>d) Final Report: Outlines the results of the analysis and recommendations for action based on the findings</p> <p>2) Training courses on products and services that should be delivered to the Marine Community to preserve human life in the sea and secure mobility of people, their belongings and merchandise in a safer way, especially under conditions of extreme meteorological events such as tropical cyclones, cold fronts, water spout, wind waves and surge waves and squall lines.</p>		<p>this would be very beneficial but given the cost, rank as lower priority</p>	
	<p>2017-18 (Refresher from the 2014 meeting)</p>	<p>\$40K</p>	
	<p>2016</p>	<p>\$30K</p>	
	<p>2016-2019</p>	<p>\$ 100K (\$25K per year)</p>	
<p>Expected Result 7 (Partnerships): 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 strategic issues</p>			
<p>Expected Result 8 (Value for Money): An effective and efficient Organization</p>			
<p>Regional Key Outcomes (RKO)</p>	<p>Deliverables/Activities; Responsible Individual</p>	<p>Timing (Year)</p>	<p>Budget Requirements</p>
<p>RKO 8 Effective and efficient regional structures and working relationships (i.e. Task and Project Teams, Management Group, Secretariat, etc.)</p>	<ul style="list-style-type: none"> Completion of the 2016-2019 Strategic Operating Plan Re-evaluation of Task Teams established by Management Group. 	<p>2016</p>	<p>None required</p>

V.5 REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC)

KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAMME	TC	LDCs, SIDS, GENDER	ACTIVITY	Y2016	Y2017	Y2018	Y2019
1.1.1	1.1.1a Enhanced timely and accurate weather forecast / warning for aviation.	AeMP, WXS	CAeMP	LDCs, SIDS	Regional events to raise awareness of and improve understanding of ICAO-WMO requirements among NMHSs and various agents of aviation sectors in the Pacific region on aviation meteorological services	✓			✓
					Assist to develop national and inter-agency formal agreements for aviation weather services among NMHSs, Fiji Meteorological Services / RSMC-Nadi and other NMHSs in the Pacific Islands	✓	✓		
					Support/promote projects for installing equipment including hardware and software for verification of TAF in NMHSs of Pacific Islands (Fiji, Papua New Guinea, and Vanuatu).	✓	✓		
					Assist in resolving Asia/Pacific deficiencies as identified by ICAO in the area of SIGMET, especially in the Pacific Islands (Cook Islands, Kiribati, Nauru, Solomon, Islands, and Tonga)	✓	✓		
					Assist to harmonize or align legislations or equivalents of NMHSs and Civil Aviation Authorities or equivalents to met ICAO-WMO requirements	✓	✓		

KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAMME	TC	LDCs, SIDS, GENDER	ACTIVITY	Y2016	Y2017	Y2018	Y2019
1.1.1	1.1.1b Implemented QMS for aviation meteorological service providers	AeMP, WXS	CAeM	LDCs, SIDS	QMS guidance (WMO webpage & forum, input into WMO/ICAO publications and COMET module)	✓	✓	✓	✓
					Twinning' or mentoring Members on QMS processes and audits	✓	✓	✓	✓
					Assist Pacific Islands Meteorological Authorities, NMHS and Civil Aviation Authorities to enhance QMS for aviation meteorological services.	✓	✓	✓	✓
1.1.1	1.1.1c Implemented cost recovery for aviation meteorological service providers	AeMP, WXS	CAeM	LDCs, SIDS	Conduct a survey on cost recovery for aviation meteorological services in RA V Members.	☐	✓		✓
					Develop and provide guidance on cost recovery for aviation meteorological services.	✓	✓	✓	✓
1.1.1	1.1.1d Implemented competency assessment for aviation meteorological service providers	AeMP, WXS	CAeM	LDCs, SIDS	Conduct a survey to determine current status of the implementation of competency assessment for AMO and AMF in RA V Members.	☐	✓		✓
					Develop and provide guidance to assist Members in RA V to implement competency assessment for AMO and AMF.	✓	✓	✓	✓
1.1.2	1.1.2 Improved coordination of weather services in the Region.	PWS, WXS	CBS		Organize session of RA V WG/WXS.		✓		
					Discussions between NMHSs and local communities to help them to improve understanding of early warnings for disaster related to weather.	✓	✓	✓	✓

KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAMME	TC	LDCs, SIDS, GENDER	ACTIVITY	Y2016	Y2017	Y2018	Y2019
					Develop weather related hazard/disaster response plans for local communities and economic sectors	✓	✓		
6.3.2	6.3.2 Met the AMO and AMF requirements in all existing and new aviation weather observers	ETR, RTC, DRA, AeMP, WXS, WCP, CLS		LDCs, SIDS, Gender	Assist Pacific Island Countries NMHSs to conduct competency assessment for AMO and AMF.	✓	✓		
7.2.3	7.2.3 Provided training by national / regional institutions and improved capacity of NMHSs in communicating weather information including warnings to the communities.	RTC, ETR, WXS, TCC		LDCs, SIDS, Gender	WMO Southern Hemisphere Training Workshop on public weather services.		✓		
					Training in communication.			✓	
					Training in media presentations (interview and writing articles)				✓
1.2.1	1.2.1 Enhanced provision of agrometeorological services to the user community	AgMP, ETRP	CAGM		Review the various dissemination methods of agro meteorological information to agricultural users. Evaluate these dissemination methods and propose appropriate mechanisms to improve them especially in developing and least developed countries.	✓	✓	✓	✓

KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAMME	TC	LDCs, SIDS, GENDER	ACTIVITY	Y2016	Y2017	Y2018	Y2019
1.2.2	1.2.2 Improved tools for operational agrometeorology in face of climate variability and climate change				<p>Review the operational use of seasonal to inter-annual climate forecasts sustainable agriculture in South West Pacific and make recommendations to improve the presentation of the forecasts for the users.</p> <p>Review the drought indices commonly used in RA V and evaluate their impacts on agricultural production.</p>	✓	✓		
3.2.1	3.2.1. Improved regional coordination mechanism and climate services, and established platform(s) for coordination of climate services in Region V.	WCP, CLS	CHy, CCI	LDCs, SIDS, Gender	<p>Organize session of RA V WG/CLS and Pacific Regional Climate Outlook Forum (RCOF).</p> <p>Organize annual (3rd, 4th, 5th and 6th) meetings of the Pacific Island Climate Services (PICS) Panel.</p> <p>Set up regional and national registration for climate services projects, programs and activities including review the structure, maintenance and use of SPREP regional database and report to WG/CLS and Pacific Meteorological Organization (PMC).</p> <p>Draft RA V RCC-Network implementation plan for the Pacific Islands and establish Regional Climate Centers (RCCs) in Region V.</p> <p>Develop strategies for climate services</p>		✓	✓	✓

KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAMME	TC	LDCs, SIDS, GENDER	ACTIVITY	Y2016	Y2017	Y2018	Y2019
					to reflect the implementation of GFCS at the national, local communities, and sectors' levels.				
4.4.1	4.4.1 Preserved historical climatological data	WCP, CLS	CCI	LDCs, SIDS	Complete digitization of paper records of climatological data in Pacific Islands.				✓
4.4.2	4.4.2 Maintained climate database	WCP, CLS	CBS, CCI	LDCs, SIDS	Provide training in the management and maintenance the climate database.	✓			✓
5.3.2	5.3.2a Strengthened global GAW stations and regional / contributing GAW stations.	GWAP			Organize GAW data to also contribute to GFCS.		✓		
					Maintain and enhancement of 1 global GAW stations and 2 regional GAW stations.	✓	✓	✓	
5.3.2	5.3.2b Improved sharing of information air quality in Region V.	GWAP			Support training and capacity building activities related to atmospheric chemistry.		✓	✓	
					Enhance GAW activities.	✓	✓		

KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAMME	TC	LDCs, SIDS, GENDER	ACTIVITY	Y2016	Y2017	Y2018	Y2019
					Organize technical exchange and cooperation on atmospheric composition observation.	✓	✓	✓	
5.4.1	5.4.1 Enhanced accuracy (temporal and spatial) of forecasts and warnings.	WWRP, CLS	CBS, CCI		Conduct studies on monsoons and their interactions with ENSO, IOD and MJO.	✓	□		✓
6.3.1	6.3.1 Provided training by national / regional institution and improved capacity of NMHSs in climate services.	RTC, ETR			Review international standards of qualification and competency for climate services production and delivery and potential adaptation of them for the Pacific region.	✓			
6.3.2	6.3.2 Increased number of climatologists in Pacific Island Countries	ETR, RTC, WCP, DRA, CLS		LDCs, SIDS, Gender	Support 3 to 4 staff from Pacific Island Countries NMHSs per year to the post-graduate diploma in climatology at the relevant institutions.	✓	✓	✓	✓
2.2.1	2.2.1a Improved flood forecasting systems and techniques	HWRP, HYS, TCC	CHy, CBS	LDCs, SIDS, Gender	Implementation of FFGS and/or other appropriate tools such as coupling Himawari8 in Region V.		✓	✓	✓
					Provision of reports and web portal information on regional applications; IFAS, TopNet, IFFRM, Delft-FEWS etc.	✓	✓		
					Propose strengthened, or establishment of, early warning systems for floods in Members of RA V.	✓	✓	✓	
2.2.1	2.2.1b Improved linkages with DRR community and other stakeholders.	HWRP, HYS, TCC	CHy, CBS	LDCs, SIDS, Gender	Promote development of hydrological products for inputs to end-to-end multi-disaster warning systems - Pac-HYCOS2, CIFDP.		✓	✓	

KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAMME	TC	LDCs, SIDS, GENDER	ACTIVITY	Y2016	Y2017	Y2018	Y2019	
					Promote regular discussions between NMSs and NHSs through a community of practice web portal.	✓	✓	✓	✓	
					Strengthen or develop national joint programmes between NMSs, NHSs and NDMOs on public awareness and education on floods that is inclusive of women, girls, youth, children, disabled people, and vulnerable communities.		✓	✓		
2.2.1	2.2.1c	Achieved benefits for the water sector through the implementation of GFCS	WCP, CLS, HWRP, HYS	CHy, CCI	LDCs, SIDS, Gender	Develop and help implement implement water sector products (climate outlooks, EHP material, workshops, etc.) as part of GFCS and IDMP.	✓	✓	✓	✓
				CHy, CCI		Review and report on appropriate database systems for small countries/agencies.	□	✓	□	□
5.4.1	2.3.1	Improved drought monitoring and management capabilities.				Assist in development of seasonal prediction products for water management purposes.		✓		✓
6.1.2	6.1.1	Reinforced communication platform for hydrological services in the region	HWRP, HYS	CHy		Develop concept note for Pac-HYCOS2, SEA-HYCOS and promote. Communicate via web portal and IWRM platforms.	✓	✓		
6.3.2	6.3.2	Increased number of hydrologists in Pacific Island Countries	ETR, RTC, HWRP, DRA, HYS	CHy	LDCs, SIDS, Gender	Support staff from Pacific Island Countries NHSs to post-graduate degrees in hydrology and courses based on QMF and WMO no. 1003.		✓	✓	

KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAMME	TC	LDCs, SIDS, GENDER	ACTIVITY	Y2016	Y2017	Y2018	Y2019
4.1.1	4.1.1b Stations metadata provided to WMO regularly.	SP, GCOS, WCP, WWW, WICOS INFR	CCI, CBS		Publicize and/or develop communication strategy or MoU or equivalents to enhance and enable NMHSs to have access and to utilize facilities and expertise in Regional Instrument Centres to calibrate meteorological instrument	✓	✓		
					Enhance the capacity of Members in RA V to achieve traceability.	✓	✓	✓	✓
					Monitor and detect discrepancies between current performance and the metadata lodged with WMO.	☐	✓	✓	✓
					Implement new WIGOS metadata standards in Members of RA V.	✓	✓	✓	
4.1.1	4.1.1c implemented WIGOS across Region V.	WWW, OBS, WIGOS, WCP, INFR	CBS	LDCs, SIDS	Develop national WIGOS implementation plans.	✓	✓		
					Organize regional workshops for managers of weather and climate observations to discuss WIGOS.		✓		☐
					Assess and provide profiles of national observing systems and networks against WIGOS requirements / standards	☐	☐	✓	
4.1.2	4.1.2a Members in the Pacific subregion received data from new generation of geostationary meteorological satellites such as Japan's Himawari-8	SP, WWW, WIGOS, WIS, INFR, TCC	CBS	LDCs, SIDS	Assist Members in the Pacific subregion to receive data from the new generation of geostationary meteorological satellites such as Japan's Himawari-8.	✓	✓	✓	✓
					Document RA V user requirements and priorities for satellite data and products	☐	✓	☐	☐

KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAMME	TC	LDCs, SIDS, GENDER	ACTIVITY	Y2016	Y2017	Y2018	Y2019
					Document regional satellite requirements using CBS / Space programme guidelines.	✓	✓	✓	✓
4.1.2	4.1.2b Increased availability of aircraft-based (AMDAR) observations in Region V.	SP, GCOS, WCP, WWW, AeM, INFR	CAeM, CBS		Develop, complete and implement Aircraft-Based Observations Implementation Plan for RA V within the perspective of GANP.	✓	✓	□	
					Discuss with Pacific national and regional airlines participate in AMDAR observations programme.	□	✓	✓	✓
4.1.2	4.1.2c Consolidated the implementation of basic networks (RBSN and RBCN including GSN and GUAN)	WWW, WCP, HWRP, MMOP, INFR, HYD	CBS		Regularly review monitoring reports and bring to the attention of Member countries.	□	✓	✓	✓
					Restore silent RBSN stations.	□	✓	✓	
					Access to and to be able to utilize ocean surface wind vector data, and satellite radar altimetry (wave height) data.	✓	✓	✓	✓
					Restore silent RBCN stations and GUAN stations.	□	✓	✓	
4.2.1	4.2.1a Implemented WIS across Region V.	WWW, WIS, WCP, INFR	CBS	LDCs, SIDS	Develop national WIS implementation plans or equivalents for Members of RA V based on ASBU's road map, WIS RAV Implementation Road Map	✓	✓	□	
					Implement RA V WIS implementation plan.	✓	✓	✓	✓
					Organize regional workshops on WIS.		□	✓	

KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAMME	TC	LDCs, SIDS, GENDER	ACTIVITY	Y2016	Y2017	Y2018	Y2019	
4.2.1	4.2.1b	Enhanced capability and capacity of Members in the Pacific to understand and meet their communication needs and to participate in the international exchange of data	WWW, WIS, INFR	CBS	LDCs, SIDS	Implement RA V WIGOS implementation plan.	✓	✓	✓	✓
						Provide training and support in WIS and other communication systems to Members of RA V.	✓	✓	□	
						Provide information and advice to Member countries on communication options	✓	✓	✓	✓
						Implement WIS in Pacific Islands' NMHSs.	✓	✓	✓	✓
4.2.2	4.2.2	Improved data processing and forecasting system in Pacific Islands' NMHSs	WWW, DPFS, INFR	CBS	LDCs, SIDS	Install data processing and forecasting systems which are compliant with WIS in Pacific Islands' NMHSs.	✓	✓		
4.3.1	4.3.1	Operationalized 70 % of GCOS stations network in Region V	WWW, GCOS, INFR	CBS, CCI		Develop regional GCOS implementation plan.		✓	✓	
						Implement GCOS implementation plan.		□	✓	✓
6.2.1	6.2.1a	Improved regional coordination of infrastructure of NMHSs.				Organize session of RA V WG/INFR.		✓	□	□
6.2.1	6.2.1b	Prepared catalogue of available of technology in use in the Region.	HWRP, OBS			Use existing survey of instrumentation.	□	✓	□	□

KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAMME	TC	LDCs, SIDS, GENDER	ACTIVITY	Y2016	Y2017	Y2018	Y2019
6.3.2	6.3.2 Met the BIP-MT requirements / standards in all existing weather and climate observers in Pacific Island Countries NMHSs	ETR, RTC, DRA, OBS, WIGOS, WIS, WXS, WCP, CLS		LDCs, SIDS, Gender	Support Pacific Islands NMHSs to ensure that all their existing and new weather and climate observers meet BIP-MT requirements.	<input type="checkbox"/>	<input type="checkbox"/>	✓	<input type="checkbox"/>
1.1.2	1.1.2a Enhanced wave modelling and NWP products including access to the information.	MMOP, WXS, TCC	JCOMM	LDCs, SIDS	Enhance wave modelling capability, including 3 wave models with wind inputs from NCEP-GFS and NAVGEM (now running operationally).		✓	✓	✓
					Install equipment including hardware and software in, and/or make available tools, techniques and information to, NMHSs in Pacific Islands to predict wave heights.		✓	✓	✓
					Install equipment including hardware and software in, and/or make available tools, techniques and information to, NMHSs in Pacific Islands to predict storm surges.		✓	✓	✓
					NMHSs of RA V TCC accessing available and utilizing tools, techniques and information to predict wave heights.	✓	✓	✓	✓
1.1.2	1.1.2b Strengthened ferry operators / inter-islands boat operators, port authorities and	MMOP, WXS, TCC, PWS	JCOMM	LDCs, SIDS, Gender	Provide forecasts for marine activities.	✓	✓	✓	✓
					Client summary at least once a year.	✓	✓	✓	✓

KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAMME	TC	LDCs, SIDS, GENDER	ACTIVITY	Y2016	Y2017	Y2018	Y2019
	enforcement agencies obtain marine forecasts.				Strengthen relationships between NMHSs and relevant marine agencies through developing agreements or equivalents with port authorities.	<input type="checkbox"/>	<input type="checkbox"/>	✓	<input type="checkbox"/>
					Develop and conduct public awareness and education in the Pacific Islands for inter-island boats operators and small crafts operators on the use and interpretation of marine weather information and forecasts.		✓		
					Installation of marine weather and climate observations equipment on ferries / inter-island shippings / boats.		✓	✓	✓
2.1.1	2.1.1 Improved coordination of tropical cyclone warnings in Region V.	TCC	CBS		Organize session of RA V TCC.	✓		✓	
					Coordinate and provide financial support to NMHSs in RA V TCC to participate in the International Workshops on Tropical Cyclones (IWTC).	<input type="checkbox"/>		✓	
6.1.2	6.1.2 Improved accessibility and capability to national tropical cyclone warnings in RA V.	TCC			Assist Pacific Island Countries NMHSs to make, transmit, communicate, and back-up system for national tropical cyclone warnings to national and local disaster management agencies.	✓	✓	✓	✓
6.3.1	6.3.1a Provided training for NMHSs in RA V TCC in tropical cyclone	RTC, ETR, TCC			Organize the WMO Southern Hemisphere Training Courses on Tropical Cyclones.	<input type="checkbox"/>	✓	<input type="checkbox"/>	✓
					Provide training, and update and	✓	✓	✓	✓

KEY PERFORMANCE INDICATOR	DELIVERABLE	PROGRAMME	TC	LDCs, SIDS, GENDER	ACTIVITY	Y2016	Y2017	Y2018	Y2019
	forecasting.				implement the tropical cyclone module for NMHSs of RA V TCC.				
					Organize participants from Pacific NMHSs to participate in attachment training at RSMC Nadi and RSMC Honolulu.	✓	✓	✓	✓
					Develop and implement competencies assessment for tropical cyclone forecasters in NMHSs of RA V TCC.	✓	✓	✓	✓
6.3.1	6.3.1b Provided training for NMHSs in RA V TCC in satellite meteorology	RTC, ETR, WXS, TCC			Organize training at WMO-CGMS Virtual Lab for Education and Training in Satellite Meteorology (centre of excellence, supported by BoM and JMA).	✓	✓	✓	✓

IV.6 REGIONAL ASSOCIATION VI (EUROPE)

RA VI Operating Plan 2016-2019 is posted on the web page of the Regional Office for Europe <http://www.wmo.int/pages/prog/dra/eur/strategicPlanning/operatingPlan.html>

ANNEX
PROGRAMMATIC FOCUS TO ACHIEVE EXPECTED RESULTS

1. Background

The main priorities and focus on the achievement of Expected Results are defined in the WMO Strategic Plan and related decisions and the directions of the Seventeenth World Meteorological Congress (Geneva, 25 May-12 June 2015). The priorities for the Organization are as listed in Table 1.

WMO carries out its work through scientific and technical programmes: namely, the World Weather Watch (WWW), World Climate Programme (WCP), Hydrology and Water Resources Programme (HWRP), Education and Training Programme (ETRP), Voluntary Cooperation Programme (VCP), Regional Programme (RP), Disaster Risk Reduction (DRR) Programme, WMO Space Programme (WMOSP), Aeronautical Meteorology Programme (AeMP), Agricultural Meteorology Programme (AgMP), Marine Meteorology and Oceanography Programme (MMOP), Public Weather Services (PWS) Programme, Tropical Cyclone Programme (TCP), World Climate Research Programme (WCRP), World Weather Research Programme (WWRP), Global Atmosphere Watch (GAW) Programme, WMO Quality Management Framework, Information and Public Affairs Programme, and WMO Programme for the Least Developed Countries. These scientific and technical programmes are designed to assist all Members in providing, and benefiting from, a wide range of meteorological and hydrological services and to address the current and emerging challenges associated with weather, climate, water and related environmental conditions.

The programmes are based on the concept and experience that mutual benefits are gained from cooperative use of the pool of knowledge that has been, and is still being, created by worldwide sharing of meteorological, hydrological and related environmental observations, data and information among Members. WMO Programmes facilitate cost-effective and efficient support to provision of weather, climate, water and related environmental services by all Members. In addition to the scientific and technical programmes are the Executive Management and the Language, Conference and Publishing Services Department (LCP) that ensure efficient operation of the Programmes. The programmes, constituent bodies and departments contributing to each expected result are indicated against each activity.

2.1 Expected Result 1 (ER 1): Improved service quality and service delivery

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

2.1.1 Improved service quality and service delivery will be achieved through the implementation of the Organization-wide Implementation Plan of the Strategy for Service Delivery applied to a number of sectors. Air and marine transport are critical enablers of global trade and economic development. Increasing density in air and marine transport with reduced tolerance for error require continuous improvement. WMO will continue to highlight the necessity to ensure compliance with international standards and promote coherent, seamless and accurate warnings of hazardous weather in collaboration with relevant national organizations (e.g. Civil Aviation Authorities) and international organizations (i.e. the International Civil Aviation Organization - ICAO and International Maritime Organization - IMO). The Agricultural Meteorological Programme will refocus its existing activities to meet the growing demands of users for more targeted weather and climate services.

WMO contributes to the enhancement of the capabilities of Members to deliver high-quality information and services in many ways with a focus on the following key client groups:

- (a) The general public (through the Public Weather Services Programme);
- (b) The emergency management sector (through the Disaster Risk Reduction Programme);
- (c) The aviation industry (through the Aeronautical Meteorology Programme);
- (d) The marine sector (through the Marine Meteorology and Oceanography Programme);
- (e) The water sector (through the Hydrology and Water Resources Programme); and
- (f) The agriculture sector (through the Agricultural Meteorology Programme).

2.1.2 The focus during the period 2016-2019 will be on:

- (a) Improving the ability of NMHSs to meet International Civil Aviation Organization (ICAO) requirements by: (i) accelerating the implementation of ICAO/WMO competency standards and Quality Management Systems (QMS); (ii) addressing the emerging needs and challenges associated with the global air navigation plan; and (iii) strengthening cost recovery frameworks;
- (b) Implementing climate services under the GFCS particularly for countries that lack them by: (i) establishing regional climate centres; (ii) identifying user requirements for climate products; and (iii) developing the Climate Services Information System (CSIS);
- (c) Facilitating the sharing of techniques and procedures in support of civil protection, the media and weather-sensitive economic sectors;
- (d) Guiding and assisting Members to maintain their Quality Management Systems (QMS), ensure the competence of aeronautical meteorological personnel by enhancing the current assessment methodologies, increase the available on-line training modules mapped to the competence requirements, and proper documentation personnel assessments;
- (e) Improving the monitoring and issuance of warnings on storm surges, droughts, floods and coastal inundation;
- (f) Proactively prepare the regulatory basis and methodological support for NMHSs to establish Quality Management System and competencies for personnel serving marine transportation in anticipation of a formal requirement by the IMO;
- (g) Promoting the application of the science of meteorology, climatology, hydrology and related technology to improve products and services through engagement in demonstration projects and other collaborative activities;
- (h) Enhancing Members' capacity to deliver services by promoting and supporting research into the social and economic impacts of weather services;
- (i) Collaborating with Members to prepare the regulatory basis and methodological support for NMHSs to establish Quality Management System and competencies for personnel serving hydrological institutions;
- (j) Training staff, particularly from NMHSs in the developing and Least Developed Countries (LDCs), to meet competency requirements for personnel engaged in service delivery;
- (k) Strengthening sub-regional cooperation in AeM;
- (l) Regular review and update of technical regulations and guidance on marine meteorological services
- (m) Assisting NMHSs to assess and demonstrate the benefits of hydrometeorological services;
and
- (n) Implementing the Organization-wide Implementation Plan of the Strategy for Service Delivery.

2.2 Expected Result 2 (ER 2): Reduced Disaster Risk

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

2.2.1 Disaster risk reduction is a key priority for all governments. NMHSs are an integral component of multi-hazard national emergency management systems and work with relevant sectors to develop products and information to support decision-making related to environmental threats. WMO is committed to providing guidance to Members on the provision of authoritative meteorological and hydrological information and advisories, through the Common Alerting Protocol and the Register of Alerting Authorities.

The focus during the period 2016-2019 will be on:

- (a) Improving the effectiveness of high quality impact-based forecasts and multi-hazard early warnings of high impact meteorological, hydrological and related environmental hazards, thereby contributing to international efforts on disaster risk reduction, resilience and prevention;
- (b) Strengthening institutional capacities of NMHSs and networks of specialized centres, such as Regional Specialized Meteorological Centres (RSMCs) and Regional Climate Centres (RCCs), designed to mitigate the threat of natural disasters;
- (c) Facilitating disaster risk analysis and the development of national multi-hazard early warning systems through institutional partnerships to ensure that services are provided and used in a cost effective, systematic and sustainable manner;
- (d) Improving forecasts and warnings using the available best science and technology;
- (e) Improving access to the products and services from the leading global numerical weather prediction centres and to training forecasters in their use, and in verification of their effectiveness through projects such as the Severe Weather Forecast Demonstration Project (SWFDP);
- (f) Ensuring that forecasts and warnings are available to all that need them, and are understood by all those who need to use them in their decision-making;
- (g) Increasing the ability of NMHSs to deliver an effective warning service;
- (h) Emphasizing the need for overall system effectiveness including collection of relevant meteorological data, analyzing the data and preparing accurate forecasts and warnings, delivering timely information to all relevant decisions-makers and to the emergency services organizations;
- (i) Enhancing the uptake of integrated flood and drought management approaches at the national level;
- (j) Working with the insurance industry to develop new products that would assist communities that are highly exposed to extreme weather to insure against possible financial impacts;
- (k) Analyzing extreme climate events, together with climate change scenarios and local conditions, to determine the best disaster risk reduction strategies by involving stakeholders such as disaster risk reduction experts, emergency services managers, climate change scientists, national and local government decision-makers, landholders and economists;
- (l) Improving infrastructure and staff capability of NMHSs in the least developed and developing countries through partnerships with the UN and other international institutions such as the World Bank, regional development banks and UNDP; and
- (m) Enhancing linkage between NMHSs and the broader disaster management community, including UN partners, NGO agencies and the private sector.

2.3 Expected Result 3 (ER 3): Improved Data-Processing, Modelling and Forecasting *Enhanced capabilities of Members to produce better weather, climate, water and related environmental information, predictions and warnings to support, in particular, reduced disaster risk and climate impact and adaptation strategies.*

2.3.1 Improved Data Processing and Forecasting emphasizes the need to effectively translate the benefits derived from research into operational products and services toward the needs of, inter alia, agriculture, water and health, and disaster risk reduction. Investments in high performance computing, and data assimilation will allow for more accurate, effective and timely predictions from NMHSs and existing specialized centres.

2.3.2 The focus during the period 2016-2019 will be on:

- (a) Continuous improvements in weather prediction by employing improved numerical weather prediction models, including Ensemble Prediction Systems, leading to higher accuracy in forecasts and warnings of high impact weather such as tropical storms, heavy precipitation events or strong winds;
- (b) Continued support to Severe Weather Forecast Demonstration Projects, with the aim of making them operational, as a cost-effective means for testing high resolution models and a practical approach for strengthening capacities through technology transfer;
- (c) Improving climate projections through the implementation of the Global Framework for Climate Services (GFCS) in particular the Climate Services Information System and the User Interface Platform;
- (d) Designing products and services that would promote the delivery of accurate, timely and effective information about climate (past, present and future) to serve complex decision-making across a wide range of climate-sensitive activities and enterprises particularly as relates to the four priority areas of the GFCS, namely disaster risk reduction, water, health and agriculture;
- (e) Strengthening operational (GDPFS) centres, especially regional centres;
- (f) Operational implementation of the GFCS/CSIS;
- (g) Improving water services to support improvements in water resource management, by promoting open access to high quality hydrological data, raising awareness of the range of available hydrological techniques by practitioners and promoting the deployment of effective improved in-situ instrumentation and remote sensing capabilities, such as radar installations and satellites;
- (h) Ensuring that Members have sufficient numbers of competent, capable and skilled human resources to undertake the work required in hydrology and water resources;
- (i) Assisting NMHSs to provide better agrometeorological services to the agricultural community;
- (j) Working with Members to put more agrometeorological data and products on WIS;
- (k) Capacity development through roving seminars, training at RTCs and interactions with other WMO and partner-based capacity-building initiatives;
- (l) Assisting NHSs to develop and maintain relevant infrastructure and human resources for providing data and products with an emphasis on implementing a Quality Management Framework-Hydrology (QMF-H) approach;
- (m) Promoting effective use of hydrological data and information in support of sustainable socio-economic development through linkages with GFCS observational requirements;
- (n) Promoting the World Hydrological Cycle Observing System (WHYCOS) project with emphasis on the use of the hydrological data collected to meet specific purposes and the development of related hydrological products and services;
- (o) Facilitating the rational development and operation of NHSs including staff education and training, increasing public awareness of the importance of hydrological activities, and providing support through technical cooperation activities; and
- (p) Developing guidance materials to assist NHSs in implementing institutional improvements, and building their capacity to assess the economic and social benefits of the services.

2.4 Expected Result 4 (ER 4): Improved Observations and Data Exchange

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

2.4.1 Improved Observations and Data Exchange addresses the development and improvements in three systems: the WMO Integrated Global Observing System, WMO Information System and WMO's contribution to the Global Climate Observing System. These programmes support the observational requirements of all WMO Programmes as well as the GFCS, GEOSS, the IPCC and Members' obligations under a number of international conventions such as, inter alia, the UNFCCC, the UNCCD and the Vienna Convention for the Protection of the Ozone Layer.

2.4.2 The focus during the period 2016-2019 will be on:

- (a) Completing the implementation of the WIGOS/WIS to address the observational requirements of all WMO Programmes and partners;
- (b) Assisting Members in the integrated design and standardized operation of national and regional observing systems that support the service delivery objectives;
- (c) Members access to practical guidance and tools for designating, planning and operating integrated observing systems and networks that addresses global standards and support national requirements for weather, climate and water services and information;
- (d) Promoting sound data and metadata management as an essential process for transforming observational data into useful products and services;
- (e) Further development of data discovery, access and retrieval services for all weather, climate, water and related data produced by centres and Members;
- (f) Implementing pilot projects to demonstrate the value of increased cooperation and dialogue between NMSs and NHSs for enhancing hydrological forecast capabilities;
- (g) Improving the HelpDesk for Integrated Flood Management (IFM HelpDesk);
- (h) Improving the efficiency and effectiveness of data and information systems;
- (i) Exploring opportunities for higher integration among observing systems that span domains (e.g., ocean, atmosphere, land) and science disciplines, and that combine in situ observation with remote sensing;
- (j) Addressing standardization of instrument measurements, methods of observation, and end-product quality assurance;
- (k) Enhancing the collection and availability of critical data needed to monitor and predict aspects of the environment, including hazards;
- (l) Improving the quality, traceability and consistency of observations, leading to better products and services;
- (m) Facilitating optimal design of observing networks and their flexibility to incorporate new observing systems;
- (n) Improving the coordination, standardization and evaluation by WMO Members of their national observing networks;
- (o) Improving climate observations for the three domains, namely the Atmosphere, Ocean Land through the co-sponsored GCOS.

2.5 Expected Result 5 (ER 5): Advance Targeted Research

Enhanced capabilities of Members to contribute to and draw benefits from the global research capacity for weather, climate, water and related environmental science and technology development.

2.5.1 Research underpins improvements in the prediction of weather, climate, water and related environmental conditions by enhancing our understanding of changes in weather, climate, the hydrological cycle and the chemical composition of the troposphere and stratosphere. This expected result will be pursued through partnerships with national scientific institutions and international organizations such as ICSU and UNESCO, amongst others. The achievements will have a significant contribution to developing user-relevant and user-friendly services for the public, disaster management, economic (marine, aviation) and support the GFCS Pillar on Research, Modelling and Prediction.

2.5.2 The focus for the period 2016-2019 will be on:

- (a) Research on high-impact weather on time scales of hours to weeks with specific attention being given to the first few days;
- (b) Improving user-oriented sub-seasonal to seasonal predictions to increase forecast skill on the sub-seasonal to seasonal timescales to inform management decisions, particularly in agriculture and food security, water, disaster risk reduction, energy and health
- (c) Advancing the Subseasonal to Seasonal (S2S) Prediction Project;
- (d) Improving operational meteorological and hydrological monitoring and prediction services in polar and high mountain regions and beyond by: (i) operationalizing the Global Cryosphere Watch (GCW); (ii) better understanding the implications of changes in these regions on the global weather and climate patterns; and (iii) advancing the Polar Prediction under the Global Integrated Polar Prediction System (GIPPS);
- (e) Advancing services for megacity and large urban complexes to assist societies in urban areas to improve their quality of life, their effective use of resources and to reduce vulnerabilities to impacts of high impact events;
- (f) Improving flood and drought predictions to increase forecast skill on different spatial and time scales to support decision-making in agriculture and food security, water resource management, disaster risk reduction, energy and health sectors;
- (g) Improving early detection and warning of tropical cyclones, floods, draughts, coastal inundation, heat waves, disease outbreaks, and poor air quality, including the waxing and waning of monsoon precipitation;
- (h) Improving flood and drought predictions to increase forecast skill on different spatial and time scales to support decision-making in agriculture and food security, water resource management, disaster risk reduction, energy and health sectors;
- (i) Conducting conferences, workshops, and/or symposiums to engage Members and enhance their awareness on potential benefits of advances in science;
- (j) Identifying and supporting new directions for weather, climate and atmospheric chemistry research to support climate services and assessments, and to meet the needs of the NMHSs and other users of weather, climate and environmental information;
- (k) Accelerating improvements in prediction skill of high-impact weather and in the utilization of weather products to address these events;
- (l) Conducting specialized training on GAW to enhance the capacity of station operators to make high quality GAW observations;
- (m) Assessing GAW observational methods for atmospheric aerosols, developing appropriate quality assurance system and performing process based studies, within the context of WIGOS and WIS;
- (n) Developing new verification techniques focusing on the needs of users across the time and spatial scales applicable to both the weather and climate communities; and
- (o) Enhancing collaboration between CCI and WCRP to work towards constant improvement of climate products and services, especially in the area of climate prediction on seasonal and decadal scales, and also on climate change projections and downscaling.

2.6 Expected Result 6 (ER 6): Strengthened Capacity Development

Enhanced capabilities of Members' NMHSs, in particular in developing and least developed countries and Small Island Developing States, to fulfil their mandates.

2.6.1 Capacity Development focuses on the need to improve the infrastructure operated by NMHS and develop their institutional and human resources capacity. By achieving this result, the WMO is able to enhance capabilities in the provision of improved weather, water and climate observations and services to support disaster risk reduction, water resource management, sustainable agriculture, and better health outcomes. A major emphasis will be on establishing climate services in those countries and territories in which basic climate services are lacking.

2.6.2 The focus for the period 2016-2019 will be on:

- (a) Enhancing the capacity of NMHSs to deliver on their mission by assisting with human resource development, technical and institutional capacities and improved infrastructure, particularly in developing, least developed and small island developing states;
- (b) Implementing WMO Strategy on Capacity Development to empower NMHS institutions and assist them in building effective communication with governments, policy- and decision-makers, and development partners to expand the number of strategic partnerships;
- (c) Scientific, technical and project management training to promote a culture of compliance with international standards and recommended practices;
- (d) Training in agrometeorology and roving seminars for farmers and NMHSs staff to develop climate information, products and services;
- (e) Training and fellowships on observing and information system;
- (f) Training and fellowships on climate and hydrology;
- (g) Capacity Development in AeM, ERA, GDPFS, SWFDP, and TC Forecasting and Warnings;
- (h) Review and implementation of technical regulations and practices;
- (i) Strengthening marine meteorological services and impact-based forecasting;
- (j) Increasing capacity of NMHSs and Regional Centres, especially in developing and least developed countries, to develop and apply weather-, climate- and water-related information and products to support climate change adaptation in their countries;
- (k) Support to GFCS implementation;
- (l) Assessing and addressing Members training needs, including, professional training and development, technical training, project development and management training;
- (m) Increasing assistance for training through WMO Fellowships Programme and other mechanisms;
- (n) Support to educational institutions in the development and application of their curricula and their scientific and technological skills;
- (o) Fostering, as appropriate, regional, sub-regional and national cooperation and institutional framework towards improving weather, water and climate observing and monitoring infrastructure and operational facilities of NMHSs and Regional Centres, particularly in developing and least developed countries;
- (p) Enhancing resource mobilization in support of capacity development;
- (q) Increasing capacity through human resources development in NMHSs to support climate change adaptation in their countries by providing more sustainable training mechanisms;
- (r) Promoting the application of climate information, such as seasonal outlooks, for adaptation to climate change and variability;
- (s) Encouraging capacity development through RCCs, RCOFs and the associated user forums;
- (t) Developing and disseminating a toolkit to support climate services training activities; and
- (u) Continued implementation of Severe Weather Forecast Demonstration Projects (SWFDPs).

2.7 Expected Result 7 (ER 7): Strengthened Partnerships

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

2.7.1 Partnerships will focus on opportunities for cooperation on the priorities outlined in the plan without compromising relationships that support other areas of WMO's mandate. WMO will foster enhanced partnerships with co-sponsors of WCRP, GCOS and the IPCC to achieve shared interests. WMO will improve NMHSs' performance in delivering services as authoritative sources of weather, water and climate services and demonstrate the value of its contribution to the broader agenda of the United Nations, particularly to sustainable development, climate change mitigation and adaptation, gender equality, human rights and rule of law.

2.7.2 In the period 2016-2019 WMO will focus on:

- (a) Monitoring partnerships to establish their continued relevance and effectiveness;
- (b) Exploring concrete ways for furthering collaborations with the economic sector through UN Global Compact, the World Economic Forum and the World Business Council for Sustainable Development;
- (c) Consolidating relationships with its partners using the GFCS mechanisms, e.g. the Inter-Agency Coordination Group (ICG) and the Partner Advisory Committee (PAC) together with the Intergovernmental Board on Climate Services (IBCS);
- (d) Contributing to the implementation and follow-up processes of major international programmes of action (for example, on disaster risk reduction, on adaptation, on LDCs, capacity development and on women);
- (e) Monitoring jointly sponsored programmes or bodies, such as IPCC, WCRP and GCOS, through specific agreements with relevant partners (for example, UNESCO-IOC, ICSU, UNEP);
- (f) Developing outreach, in particular on the Internet, using collaborative platforms as well as social media to enhance weather, climate and water knowledge base in a demand-driven and user-oriented perspective;
- (g) Promoting the contribution of operational hydrology and water-related climate services to integrated water resources management at the basin/catchment scale around the world;
- (h) Implementing the Associated Programme on Flood Management (APFM) and the Integrated Drought Management in collaboration with the Global Water Partnership (GWP), the United Nations Convention to Combat Desertification (UNCCD) and the Food and Agricultural Organization (FAO);
- (i) Assisting countries to establish and implement National Drought Policies, based on sound scientific understanding and guidance;
- (j) Supporting countries to apply the Integrated Flood Management concept and providing guidance and advice on flood plain management actions;
- (k) Developing and implementing ISO quality assurance standards for the management of both air and maritime operations;
- (l) Developing and maintaining strategic partnerships with UN agencies such as UNDP, UNISDR, UNEP-FI, WFP, international and regional development agencies and banks, regional socio-economic groupings, humanitarian community, and the private sector associations in areas such as risk transfer (e.g., insurance, reinsurance) that assist NMHSs to better undertake their national roles in disaster risk reduction;
- (m) Assisting developing countries to build their risk reduction capability;
- (n) Assisting NMHS to establish partnerships with Disaster risk Management Agencies, and various socio-economic sectors affected by natural hazards such as agriculture, energy, water resource management, finance and planning, as well as statistical bureaus collecting loss and damage data with emergency management organizations so as to promote closer relationships between these organizations and the NMHSs;

- (o) Supporting the Group on Earth Observations (GEO) process and contributing to the implementation of the Global Earth Observation System of Systems (GEOSS) to the extent possible within the WMO mandate;
- (p) Publishing WMO Bulletin twice a year in English, French, Russian and Spanish;
- (q) Implementing IPA Strategy;
- (r) Implementing gender mainstreaming activities; and
- (s) Continued support to IPCC.

2.8 Expected Result 8 (ER 8): Improved Efficiency and Effectiveness

Ensured effective functioning of policy-making and constituent bodies and oversight of the Organization.

2.8.1 Improved Effective and Efficient Organization seeks to ensure robust oversight of the programmes and financial management of the Organization and accountability to Members. This includes developing a coherent Strategic Plan, Operating Plan, Results-based Budget and a Monitoring and Evaluation system that integrates activities of all parts of the Organization, including governing and constituent bodies, and the Secretariat. High quality, affordable language, conference and publishing services will be provided to WMO Members through the production of publications and the delivery of conference services in an appropriate number of working languages as defined by Congress to facilitate decision-making. WMO will also continue to implement risk management as an integral part of its system of internal control and results-based management, and promote Quality Management Systems in NMHSs and within the WMO Secretariat for efficient and effective use of resources.

The focus in 2016-2019 will be on:

- (a) Conducting a strategic review of WMO structures, operating arrangements and budgeting practices focusing on the effectiveness of constituent body activities and the Secretariat arrangements;
- (b) Improving the efficiency and effectiveness of governing and constituent bodies;
- (c) Promoting open and transparent business processes, efficient and effective use of resources, and equitable treatment of all parties;
- (d) Enhancing the efficiency of the WMO Secretariat and fostering climate-friendly operations;
- (e) Ensuring the integrity of WMO management systems;
- (f) Improving the connection between the Organization's strategic priorities and initiatives, programmes and budget, through results-based management systems and practices;
- (g) Conducting a comprehensive review of structures, programmes and priorities and implementing the relevant findings;
- (h) Promoting gender equality and empowerment of women across the Organization and NMHSs;
- (i) Promoting the culture of compliance with WMO regulations and standards, and fostering the rule of law;
- (j) Improving support services, a key factor in efficient functioning of constituent bodies, by providing for translation, interpretation, and meeting planning functions;
- (k) Improving the efficiency, effectiveness and transparency of the programmatic and financial management of the Organization to allow an appropriate level of management and financial control;
- (l) Continued implementation of ERM and WMO RBM, based on WMO SP, WMO OP, Results-based Budget (RBB), WMO M&E, WMO Risk Management Policy and WMO Risk Management Framework, to increase the confidence and commitment of Members in supporting the Organization;
- (m) Providing guidance on strategic planning to developing and least developed countries;
- (n) Engaging in UN initiatives promoted by the CEB to heighten its standards in domains such as the greening of the Organization and the development of quality assurance;
- (o) Increased involvement of internal oversight (either of assurance or a consulting nature) in governance, risk management, and control;

- (p) Providing high quality and affordable language, conference and publishing services;
- (q) Improving linguistic and publications services;
- (r) Providing high-quality conference, procurement, travel and common services; implementing WMO Policy on Gender Mainstreaming and the incorporation of gender aspects in relevant programmes and activities; and
- (s) Supporting the implementation of GFCS activities.

LIST OF ACRONYMS AND ABBREVIATIONS

ADM	Advanced Dissemination Method
AEM	Aeronautical Meteorology Division
AeMP	Aeronautical Meteorology Programme
AG	Advisory Group
AgM	Agricultural Meteorology Division
AgMP	Agricultural Meteorology Programme
AMDAR	Aircraft Meteorological Data Relay
AMMA	African Monsoon Multidisciplinary Analysis
APSDEU	Asia-Pacific Satellite Data Exchange and Utilization Meeting
ASG	Assistant Secretary-General (WMO)
BIPM	Bureau International des Poids et Mesures
BSH	Basic Systems in Hydrology
CAeM	Commission for Aeronautical Meteorology
CAGM	Commission for Agricultural Meteorology
CAS	Commission for Atmospheric Sciences
CBH	Capacity Building in Hydrology
CBS	Commission for Basic Systems
CCA	Climate Coordination Activities
CCI	Commission for Climatology
CDMS	Climate Data Base Management System
CEOP	Coordinated Enhanced Observing Period
CEOS	Committee on Earth Observation Satellites
CER	Cabinet and External Relations (Department, WMO)
Cg	WMO Congress
CGMS	Coordination Group for Meteorological Satellites
CHy	Commission for Hydrology
CIMO	Commission for Instruments and Methods of Observation
CLIPS	Climate Information and Prediction Services
CLW	Climate and Water (Department, WMO)
CLIVAR	Climate variability and predictability study (WCRP)
COP	Conference of the Parties
COPUOS	United Nations Committee on the Peaceful Uses of Outer Space
CWI	Programme on Cooperation in Water-related Issues
DRA	Development and Regional Activities (Department, WMO)
DRR	Disaster Risk Reduction Programme
DSG	Deputy Secretary-General
EC	Executive Council (WMO)
EPAC	Environmental Pollution and Atmospheric Chemistry
ERA	Emergency Response Activities
ESCAP	Economic and Social Commission for Asia and the Pacific (UN)
ET	Expert Team
ETRP	Education and Training Programme
FAH	Programme on Forecasting and Applications Hydrology
FAO	Food and Agriculture Organization of the United Nations
GAW	Global Atmosphere Watch
GCN	GLOSS (Global Sea-Level Observing System) Core Network
GCOS	Global Climate Observing System
GDPS	Global Data-processing System
GEO	Group on Earth Observations
GEOSS	Global Earth Observation System of Systems
GEWEX	Global Energy and Water Cycle Experiment (WCRP)
GMDSS	Global Maritime Distress and Safety System
GOOS	Global Ocean Observing System
GOS	Global Observing System
GSICS	Global Space-based Inter-calibration System

GTN-H	Global Terrestrial Network-Hydrology
GTOS	Global Terrestrial Observing System
GTS	Global Telecommunication System
GUAN	GCOS (Global Climate Observing System) Upper-Air Network
HFA	Hyogo Framework for Action
HFW	Hydrological Forecasting for Water Resources Management
HNRC	HOMS National Reference Centres
HOMS	Hydrological Operational Multipurpose System
HYCOS	Hydrological Cycle Observing System (component of WHYCOS)
HWRP	Hydrology and Water Resources Programme
IACRNA	Inter-Agency Committee on Response to Nuclear Accidents
IAEA	International Atomic Energy Agency
IASC	International Arctic Science Committee
ICAO	International Civil Aviation Organization
ICSU	International Council for Science
ICT	Implementation/Coordination Team
IFRC	International Federation of Red Cross and Red Crescent Societies
IGACO	Integrated Global Atmospheric Chemistry Observations (strategy)
IGDDS	Integrated Global Data Dissemination Service
IGOS	Integrated Global Observing Strategy
IGWCO	Integrated Global Water Cycle Observations
IMOP	Instruments and Methods of Observation Programme
IOC	Intergovernmental Oceanographic Commission (UNESCO)
IOO	Internal Oversight Office
IPCC	Intergovernmental Panel on Climate Change (WMO/UNEP)
IPM	Informal Planning Meeting
IPWG	International Precipitation Working Group
IPY	International Polar Year
IRI	International Research Institute for Climate and Society
IROWG	International Radio-Occultation Working Group
ISCU	International Council for Science
ISDR	International Strategy for Disaster Reduction
ISO	International Organization for Standardization
ISS	Information Systems and Services
ITWG	International A-TOVS Working Group
IWRM	Integrated Water Resources Management
JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
JSC	Joint Scientific Committee (WCRP)
LC	Legal Counsel
LDC	Least Developed Country
LCP	Language, Conference and Publishing Services (Department, WMO)
MDG	Millennium Development Goal
MG	Management Group
MMOP	Marine Meteorology and Oceanography Programme
MPERSS	Marine Pollution Emergency Response Support System
NAEDEX	North America-Europe Data Exchange meeting
NGO	Non-governmental organization
NHS	National Hydrological Service
NMC	National Meteorological Centre
NMHS	National Meteorological and Hydrological Service
NMS	National Meteorological or Hydrometeorological Service
NWP	Numerical Weather Prediction
OBS	Observing and Information Systems (Department, WMO)
OC	Overall Coordination of WMO Scientific and Technical Programmes
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
OPAG	Open Programme Area Group
PMO	Policy Making Organs (WMO)

PPR	Programme Performance Report
PR	Permanent Representative
PWS	Public Weather Services Division
PWSP	Public Weather Services Programme
QMF	Quality Management Framework
RA	Regional Association
R&D	Research and Development
REM	Resource Management (Department, WMO)
RICs	Regional Instrument Centre
RMDP	Resource Mobilization and Development Partnerships
RP	Regional Programme
RRCs	Regional Radiation Centre
RSMC	Regional Specialized Meteorological Centre
RTC	Regional Training Centre
SBSTA	Subsidiary Body for Scientific and Technological Advice (UNFCCC)
SCHOTI	Standing Conference of Heads of Meteorological Training Institutions
SFCG	Space Frequency Coordination Group
SG	Secretary-General
SIDS	Small Island Developing State
SOP	Secretariat Operating Plan
SP	Strategic Plan
SSA	System Support Activity
TC	Technical Commission
TCP	Tropical Cyclone Programme
TCOP	Technical Cooperation Programme
TECO	Technical Conference on Meteorological and Environmental Instruments and Methods of Observation
TF	Trust Fund
TFSP	Task Force on Seasonal Prediction
THORPEX	Hemispheric Observing System Research and Predictability Experiment
TMT	Training Management Team
TOR	Terms of Reference
UN	United Nations
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNOOSA	United Nations Office for Outer Space Affairs
UNICEF	United Nations Children's Fund
UNOSAT	United Nations Institute for Training and Research Operational Programme on Satellite Applications
UNWTO	United Nations World Trade Organization
VACS	Variability of the African Climate Systems
VCP	Voluntary Cooperation Programme
VL	Virtual Laboratory
WAFS	World Area Forecast System
WAMIS	World Agrometeorological Information Service
WB	World Bank
WCAC	World Climate Applications and CLIP (Division, WMO)
WCASP	World Climate Applications and Services Programme
WCDMP	World Climate Data and Monitoring Programme
WCP	World Climate Programme
WCRIP	World Climate Assessment and Response Strategies Programme
WCRP	World Climate Research Programme
WDM	WWW Data Management
WG	Working Group

WGNE	Working Group on Numerical Experimentation
WG-PIW	Working Group on Planning and Implementation of the WWW
WHYCOS	World Hydrological Cycle Observing System
WIGOS	WMO Integrated Global Observing System
WIS	WMO Information System
WMC	World Meteorological Centre
WMO	World Meteorological Organization
WMOSP	WMO Space Programme
WOAP	WCRP Observation and Assimilation Panel
WFP	World Food Programme
WRC	World Radiation Centre
WRI	Programme on Water-related Issues
WSSD	World Summit on Sustainable Development
WWRP	World Weather Research Programme
WWW	World Weather Watch
