Expected Result 4

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

	RKO 4.1	**WMO Integrated Global Observing System (WIGOS) is implemented in RA II.**								**Baseline and Target**
	RKO 4.1.1	**WIGOS is implemented in the Region based on CONOPS and RA II WIGOS Implementation Plan**								
	KPI 4.1.1	**Number of NMHSs that have successfully implemented the WIGOS in compliance with CONOPS**								
	KPI 4.1.2	**Number of NMHSs that deliver high-quality observational data**								
	KPI 4.1.3	**Increased observing systems' interoperability, data compatibility and traceability of observations**								
	KPI 4.1.4	**Increased availability of observational data for users**								
	Deliverables	**Activities**	**Programme**	**TC**	**Responsibility**	**2012**	**2013**	**2014**	**2015**	
4.1	Regular maintenance and calibration of observation instruments	(a) implementation of the Pilot Project to Enhance the Availability and Quality Management Support for NMHSs in Surface, Climate and Upper-air Observations; (b) provide education and training support for NMHSs	IMOP, WWW	CIMO, CBS	(a) Coordinating Group of the Pilot Project; (b) WMO and developed Members	x	x	x	x	Percentage of Members having a regular programme for maintenance and calibration of observation instruments, to reach 75% or above.
4.2	Reliability of quality management routines and procedures of weather observations	(a) implementation of the Pilot Project to Enhance the Availability and Quality Management Support for NMHSs in Surface, Climate and Upper-air Observations	IMOP, WWW	CIMO, CBS	(a) Coordinating Group of the Pilot Project;	x	x	x	x	Percentage of Members implementing reliability measures on their quality management routines and procedures of weather observations, to reach 75% or above.
4.5	Availability of qualified maintenance technicians in NMHSs	(a) implementation of the Pilot Project to Enhance the Availability and Quality Management Support for NMHSs in Surface, Climate and Upper-air Observations;	IMOP, WWW	CIMO, CBS	(a) Coordinating Group of the Pilot Project;	x	x	x	x	Percentage of Members having qualified maintenance technicians in their service, to reach 25% or above.
4.18	Ensuring the accuracy of the instruments they use	(a) identify quality requirements and user expectations; (b) enhancement of capacities of RA II RICs; (c) RIC training workshop for the Members;	IMOP, WWW	CIMO, CBS	(a) SG-IOS; Members	x	v	x	x	(i) Percentage of Members using the service of RICs (Regional Instrument Centre), to reach 50% or above; (ii) Percentage of Members using the service of national standards laboratory / institution, to reach 50% or above
2.2	Reliability of maintenance procedures for measurement and equipment (including gauges) in hydrological stations and of quality control procedures applied on data collected from hydrological stations	develop SOPs for operation and maintenance of stations	IMOP, HWR, WWW	CIMO, CHY, WWW	WG-H	x	x			Percentage of Members having implemented reliability measures for their maintenance procedures for measurement and equipment in hydrological stations and for their quality control procedures applied on data collected from their hydrological stations, to reach 25% or above.
4.3	Real-time delivery of measured observations at remote stations	(a) iImplementation of the Pilot Project to Enhance the Availability and Quality Management Support for NMHSs in Surface, Climate and Upper-air Observations	WWW	CBS	(a) Coordinating Group of the Pilot Project;	x	x	x	x	Percentage of Members implementing real-time relay of measured observations from remote stations, to reach 25% or above.
(New 1)	Increased observational data availability for users	(a) monitor availability of data, identify deficiencies and propose measures for their resolutions; (b)	WWW	CBS	(a) SG-IOS; RA II; WMO/RAP and Members; (b)	x	x	x	x	

(New 2)	Regional WIGOS Implementation Plan (WIP) [is developed]	(a) establish a Task Team on WIP; (b) identify key regional requirements of users and determine regional priorities; (c) encourage Members to develop national WIGOS Implementation Plan; (d) provide Members with technical guidance and capacity development support; (e) coordinate with SG-WIS	WWW	CBS	(a) SG-IOS; (b) SG-IOS; (c) RA II and WMO OBS Dept. (d) SG-IOS and WMO OBS (e) Members and WMO OBS	x				
(New 3)	RA II WIGOS/WIS Observation and Information Portal (is developed)	(a) comprehensive review of all existing observing systems in the Region; (b) development of portal for comprehensive weather data and products; (c) development of portal for standard and best practices;	WWW	CBS	SG-IOS; Task Team	x	x	x	x	
(New 4)	Integration of Observing Systems for supporting Disaster Risk Reduction and aviation services	(a) standardization of RBSN/RBCN stations; (b) integration of weather radar product for severe weather monitoring in the sub-regional level; (c) development of integrated surface-based and space-based operational products; (d) training and workshop on standard data management procedure.	WWW	CBS	SG-IOS; Task Team	x	x	x	x	
	RKO 4.1.2	**Observing networks are further improved in RA II.**								
	KPI 4.1.2	**Number of NMHSs that have successfully implemented the improvement of observation capability**								
	Deliverables	**Activities**	**Programme**	**TC**	**Responsibility**	**2012**	**2013**	**2014**	**2015**	
(New 5)	New design of the Regional and Subregional observing networks	(a) utilisation of all observations from various sectors in the Region; (b) workshop on standardization of observational systems;	WWW	CBS	SG-IOS; Task Team; Members	x	x	x	x	
4.4	Enhanced temporal and spatial coverage of weather measurements		WWW	CBS	Members	x	x	x	x	Percentage of Members expanding their weather measurements, both temporally and spatially, to reach 25% or above.
4.6	Maintenance/enhancement of operational Regional Basic Synoptic Network (RBSN) surface stations in the Region	(a) encourage and facilitate exchange and training on relevant know-how	WWW	CBS	Members	x	x	x	x	Number of RBSN surface stations implemented and operational, to reach 1 420 (or +0.5%) or above. [2008 level: 1413]
4.7	Maintenance/enhancement of automatic weather stations (AWSs) in the Region	(a) encourage and facilitate exchange and training on relevant know-how	WWW	CBS	Members;	x	x	x	x	Number of AWSs implemented, to reach 4 300 (or +1.9%) or above. [2008 level: 4221
4.8	Maintenance/enhancement of rainfall stations in the Region	(a) encourage and facilitate exchange and training on relevant know-how	WWW	CBS	Members	x	x	x	x	Number of rainfall stations implemented, to reach 39 000 (or +2.2%) or above. [2008 level: 38 173]
4.9	Maintenance/enhancement of operational RBSN upper-air stations in the Region	(a) encourage and facilitate exchange and training on relevant know-how	WWW	CBS	Members	x	x	x	x	Number of RBSN upper-air stations implemented and operational, to be maintained at 304 (no change) or above. [2008 level: 304]
4.10	Maintenance/enhancement of operational Regional Basic Climatological Network (RBCN) stations in the Region	(a) encourage and facilitate exchange and training on relevant know-how	WWW, WCP	CBS, CCl	Members	x	x	x	x	Number of RBCN stations implemented and operational, to reach 765(or +0.1%) or above. [2008 level: 764]

4.13	Maintenance/enhancement of operational weather radar stations in the Region	(a) encourage and facilitate exchange and training on relevant know-how	WWW	CBS	Members	x	x	x	x	Number of weather radar stations implemented and operational, to reach 315 (or +1.0%) or above. [2008 level: 312]
4.14	Maintenance/enhancement of ground station(s) in the Region to receive high-resolution images from geostationary meteorological satellites	(a) encourage and facilitate exchange and training on relevant know-how	WWW, SP	CBS	Members	x	x	x	x	Percentage of Members operating such ground station(s), to be maintained at 69% (no change) or above. [2008 level: 69%]
2.1	Growth in spatial and temporal coverage of hydrological observation networks	maintain stations with long hydrological records for climate services	HWR, WWW	CHY, CBS	Members	x	x	x	x	Percentage of Members expanding their hydrological observation network both spatially and temporally, to reach 25% or above.
4.15	Maintenance/enhancement of Global Atmospheric Watch (GAW) stations in the Region	(a) encourage and facilitate exchange and training on relevant know-how	WWW, GAW	CBS, CAS	Members	x	x	x	x	Number of GAW stations implemented, to be maintained at 34 (no change) or above. [2008 level: 34]
4.16	Maintenance/enhancement of operational tide gauges in the Region	(a) encourage and facilitate exchange and training on relevant know-how	WWW, MMOP	CBS, JCOMM	Members	x	x	x	x	Number of tide gauges implemented, to reach 235 (or +0.9%) or above. [2008 level: 233]
4.17	Maintaining/recruiting more voluntary observing ships (VOS) for meteorological, oceanographic and/or upper-air observations	(a) encourage and facilitate exchange and training on relevant know-how	WWW, MMOP	CBS, JCOMM	Members	x	x	x	x	Number of VOSs operating in the Region (to be determined in the next survey).
4.19	Operation of AWSs on green technology (including use of renewable energy such as solar and wind power), for sustainable development	(i) and (ii): (a) organize training course for Members	WWW	CBS	Members	x	x	x	x	(i) Percentage of Members operating AWSs on green technology, to reach 25% or above; (ii) Total number of AWSs in the Region operating on green technology, to be determined in the next survey.

	WMO KO 4.2	**WMO Information System is developed and implemented within RA II.**								**Baseline and Target**
4.24	**RKO 4.2.1**	**Continued consolidation of the GTS to the managed network (AMDCN) is implemented with advanced centres (e.g., GISCs).**								
	KPI 4.2.1	**Number of NMHSs that have successfully implemented the WIS in compliance with the regional WIS Implementation Plan**								
	Deliverables	**Activities**	**Programme**	**TC**	**Responsibility**	**2012**	**2013**	**2014**	**2015**	
(New 1)	Regional WIS implementation plan for RA II [is developed]	(a) continue identification of WIS requirements of Members; (b) arrange a coordination meeting for GISCs and candidadtes; (c) provide guidance to Members in joining an AMDCN managed by their responsible GISC and implementation of their connection; (d) organize training, WIS experts' visit for WIS implementation; (e) human resources mobilization;	WWW	CBS	(a) SG-WIS; (b) SG-WIS, GISCs and candidates; (c) GISCs; (d) advanced centres; (e) RA II and advanced centres;	x	x			(i) Mobilaization of one or two experts of "Local Secondment" for development of Regional WIS Implementaion Plan; (ii) Presentation of Regional WIS Implementation Plan at 1st version to XV-RA II.
(New 2)	Implementation of GISCs, DCPCs and NCs in RA II	(a) demonstrate capabilities of GISCs and DCPCs; (b) organize a national workshop for potential NCs; (c) produce regional information documents on WIS;	WWW	CBS	(a) GISC candidadtes, CBS, EC (b) Members (c) SG-WIS	x	x	x	x	14th Congress felt that the area of responsibility of each RA II GISC should be officially agreed upon at the next session of RA II, now scheduled in 2012. However, to allow the Members of RA II to benefit from the new system before this, Congress encouraged RA II to initiate the coordination and consultations as a tentative solution so that each National Centre should be linked to a principal GISC and to a secondary GISC, taking into account the efficiency of options, the cost effectiveness for both NCs and GISCs, data distribution capacity of the GISCs, and the current structure of the GTS.
(New 3)	Assessment of the implementation of WIS in RA II	(a) monitor the implementation of IGDDS; (b) survey to monitor the status of AMDCN development/implementation;	WWW	CBS	(a) SG-WIS (b) SG-WIS, GISCs		x	x	x	(i) Percentage of Members successfully implementing WIS, to reach 50% or above; (ii) Percentage of Members benefiting from WIS in terms of data and products exchange, to reach 50% or above.
(New 4)	Reform of VPN Pilot Project in RA II and RA V	(a) coordination of new themes and sharing workloads; (b) development and evaluation of new WIS applications; (c) provision of evaluated techniques and applications to operational WIS centers; (d) expanding project participants;	WWW	CBS	Coordinators in RA II and RA V, Steering Group of the project (CMA, JMA, HKO, BoM, NZ MetServices), project participants	x	x	x	x	Reporting the reform with initial outcomes to CBS-XV and XV-RAII
	RKO 4.2.2	**GTS is further improved.**								
	KPI 4.2.2	**Number of NMHSs that have successfully implemented the improvement of telecommunication capability**								
	Deliverables	**Activities**	**Programme**	**TC**	**Responsibility**	**2012**	**2013**	**2014**	**2015**	
4.20	Improvement of the Regional Meteorological Telecommunication Network (RMTN) to meet the minimum required bandwidth of 64kbps	(a) encourage the migration from analogue to digital circuits in the Middle-East and Central Asia; (b) continue annual survey in the RMTN status;	WWW	CBS	(a) RTHs; (b) SG-WIS and Members;	x	x	x	x	Achievement of all RMTN circuits at actual bandwidth of more than/equal to 64kbps

(New 5)	Solution of isolated NMCs from the GTS	(a) encourage and facilitate exchange on relevant know-how; (b) render assistance to NMCs Baghdad, Kabul and Thimpu;	WWW	CBS	(a) SG-WIS, related RTHs; (b) related RTHs, WMO;	x	x	x	x	
4.21& 4.22	Connection to the Internet by broadband VPN	(a) provide assistance	WWW	CBS	RTHs and Members	x	x	x	x	A high percentage of Members connected to Internet by broadband, to reach 91% (or +1 Member) or above. [2008 level: 88%]
4.23	Shift from the costly radiofacsimile broadcast of meteorological and oceanographic information in chart form to more economical modern communication means	(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	WWW	CBS	Members	x	x			Number of marine met service providers who are still running radiofacsimile broadcast, to be kept at 25% or below.
(New 6)	Revised Volume II (Regional Aspects) of Manual on the GTS (1991 edition)	designate a new Theme Leader in Regional GTS Manual	WWW	CBS	MG; SG-WIS and Members	x	x			Submission of a draft amendment for Volume II of Manual on the GTS to XV-RA II
	RKO 4.2.3	**Data discovery, access and retrieval (DAR) services are implemented.**								
	KPI 4.2.3	**Number of NMHSs that have successfully implemented Metadata catalogue**								
	Deliverables	**Activities**	**Programme**	**TC**	**Responsibility**	**2012**	**2013**	**2014**	**2015**	
(New 7)	Data catalogue is implemented by DCPCs and NCs	(a) review and complement the initial catalogue for DCPCs and NCc; (b) develop a system for synchronization of data catalogue with relevant centres	WWW	CBS	GISCs, DCPCs and NCs	x	x	x	x	Percentage of Members joined metadata management of WIS in RA II, to reach 50 % or above;
	RKO 4.2.4	**Migration to Table Driven Code Forms (TDCF) is implemented.**								
	KPI 4.2.4	**Number of Members exchanging data in Table Driven Code Forms (TDCF)**								
	Deliverables	**Activities**	**Programme**	**TC**	**Responsibility**	**2012**	**2013**	**2014**	**2015**	
(New 8)	A national migration plan is developed	(a) develop a national migration plan based on the migration guidance (ref. WMO letter of 1 April 2008, Annex II); (b) coordinate the migration plan within the country	WWW	CBS	Members	x	x	x		Number of Members having national migration plan to be 75% or above out of members that have not started migration in 2012.
(New 9)	A regional contingency plan (step-by-step migration) is developed.	(a) RTHs provide its plan for assisting NCs in their responsibility area that have difficulties in migration (b) develop a regional plan by compiling plans of members and RTHs	WWW	CBS	RTHs	x	x	x		A regional contingency plan to be develped and maintained.
(New 10)	NMHSs requiring support for migration are assisted	(a) advise/assist Members on all aspects of migration in collaboration with national focal points; (b) provide expert services	WWW	CBS	(a) RTHs, SG-WIS; (b) WMO (VCP) and RA II;	x	x	x		A list of advise/assistance needed is developed and maintained.

	RKO 4.3	**Accessible climate observations and climate data archives at NMHSs and global Centre are increased in RA II.**								**Baseline and Target**
	RKO 4.3.1	**Implementation of the Global Climate Observing System (GCOS) is progressed.**								
	KPI 4.3.1	**Number of NMHSs that have contributed to the implementation of GCOS**								
	Deliverables	**Activities**	**Programme**	**TC**	**Responsibility**	**2012**	**2013**	**2014**	**2015**	
4.11	Maintenance/enhancement of operational GCOS surface stations in the Region	(a) encourage and facilitate exchange and training on relevant know-how	WCP, GCOS, WWW	CCl, CBS	Members	x	x	x	x	Number of GCOS surface stations implemented and operational, to be maintained at 294 (no change) or above. [2008 level: 294]
4.12	Maintenance/enhancement of operational GCOS upper-air stations in the Region	(a) encourage and facilitate exchange and training on relevant know-how	WCP, GCOS, WWW	CCl, CBS	Members	x	x	x	x	Number of GCOS upper-air stations implemented and operational, to be maintained at 39 (no change) or above. [2008 level: 39]
(New 1)	Improved observations for climate services	(a) enhancement of capacities of RA II RICs; (b) development of the RA II operational climate database; (c) RIC training workshop for the Members	WCP, GCOS, WWW	CCl, CBS	RA II and Members	x	x	x	x	
	RKO 4.3.2	**Historical climate data are preserved.**								
	KPI 4.3.2	**Level of availability of long period, rescued, digitized climate records with appropriate metadata**								
	Deliverables	**Activities**	**Programme**	**TC**	**Responsibility**	**2012**	**2013**	**2014**	**2015**	
(New 2)	Increased availability of rescued and digitized climate data	(a) encourage and facilitate exchange and training on relevant know-how; (b) render assistance to NMHSs for DARE projects	WCP, WWW	CCl, CBS	(a) Members; (b) WMO and Members;	x	x	x	x	