REGIONAL ASSOCIATION II (ASIA)

NINTH SESSION OF THE RA II MANAGEMENT GROUP

GENEVA, 27 MAY 2015

FINAL REPORT

WORLD METEOROLOGICAL ORGANIZATION

NINTH SESSION OF THE RA II MANAGEMENT GROUP[1]
(Geneva, Switzerland, 27 May 2015)

1. ORGANIZATION OF THE SESSION

1.1 The ninth session of the RA II Management Group (MG-9) was held at the International Conference Centre of Geneva (CICG) in Geneva on Wednesday, 27 May 2015 during the seventeenth session of the World Meteorological Congress (Cg-17). Mr Ahmed Abdulla Mohammed, president of RA II opened the session at 13:30 on 27 May 2015. The Group adopted the provisional agenda as given in Annex I.

2. MATTERS ARISING FROM THE EIGHTH SESSION

2.1 The Group recalled that the eighth session of the RA II Management Group (MG-8: Geneva, 18 June 2014) focused mainly on the review of the activities of the RA II subsidiary bodies; the follow up to the fifteenth session of Regional Association II (RA II-15) including the membership of RA II subsidiary bodies, monitoring and evaluation of the implementation of Strategic Operating Plan (SOP) for 2012–2015 based on the outcomes from the RA II WG/ICT/TT Chairpersons meeting which was held in Doha, Qatar, 27–28 May 2014, Work Plan of Working Groups (WG) and implementation and coordination teams and the preparation for the sixth session of Regional Conference in RA II (RECO-6); the survey on institutional arrangements for National Meteorological and Hydrological Services and identification of future priorities; the RA II SOP for 2016–2019; the location of the regional office for Asia and the south-west Pacific; and increasing the number of seats for RA II in the Executive Council (EC).

2.2 The Group noted that the overseeing MG members for the WGCS and WG-WIGOS/WIS were replaced by Mr Noritake Nishide, Permanent Representative of Japan with WMO and Dr Ko Yunhwa, Permanent Representative of the Republic of Korea, respectively, who are the newly elected EC members decided by the EC-66.

2.3 The Group, agreeing that it is not feasible to carry out 126 deliverables with more than 200 activities listed in the RA II SOP 2012–2015, requested that the Work Plan should retain only the concrete action items including the pilot projects established in RA II-15 to be implemented especially for the monitoring and evaluation purposes.

3. OUTCOMES OF THE SIXTH REGIONAL CONFERENCE ON MANAGEMENT OF NATIONAL METEOROLOGICAL AND HYDROLOGICAL SERVICES IN REGIONAL ASSOCIATION II

3.1 Challenges and future priorities

3.1.1 The Group was informed that the Sixth Regional Conference on Management of National Meteorological and Hydrological Services in Regional Association II (RECO-6) was held in Doha, Qatar, 2–4 December 2014, with the theme of “multi-hazard early warning

[1] The presentation materials and relevant documents for the MG-9 are available at the WMO web site: https://sites.google.com/a/wmo.int/raii-mg9/

system for disaster risk management and aviation safety" and that the Conference was attended by 54 participants including Directors and senior officials of NMHSs representing 24 Members in the Region, and one invited keynote speaker.

3.1.2 The Group noted that the participants in the Conference discussed and identified individual or sub-regional Members' needs and related priorities for 2016–2019 for the contribution to the WMO Strategic Operating Plan (SOP) 2016–2019. Following extensive sub-regional and plenary discussions, the Conference came to the conclusions and recommendations to the MG regarding the most urgent challenges and future priorities for the NMHSs in RA II for the contribution to the WMO SOP 2016–2019. The recommendations on the challenges and future priorities are given in Annex II and the final report of the Conference is made available on the RAP website at https://www.wmo.int/pages/prog/dra/rap/documents/RAII-RECO-6-finalreport.pdf.

3.2 Survey on institutional arrangement for NMHSs and identification of future priorities: updates for LDCs

3.2.1 The Group reviewed that the survey on Institutional Arrangement for NMHSs and Identification of the Challenges and Future Priorities in RA II was conducted with specific focus on following thematic categories: (a) institutional arrangements; (b) management and organization; (c) operations and services; and (d) challenges and priorities. The outcomes of the survey were further discussed during the RECO-6. The Group was pleased to note that the final report of the survey has been made available on the RAP website at https://www.wmo.int/pages/prog/dra/documents/RAII-RECO-6-surveyrepot.pdf.

3.2.2 The Group also noted that a special report was prepared for the LDCs in RA II based on a request from the president of RA II during the RECO-6. The Group expressed its appreciation to Mr L.S. Lee (Hong Kong, China), Chairperson of the RA II Task Team on Strategic Planning, for his contribution to the development of this report in cooperation with the Secretariat. The report is attached as Annex III.

3.3 Progress reports of the Working Groups

3.3.1 The Group was informed of the activities of the RA II subsidiary bodies including: Working Group on Weather Services (WGWS), Working Group on Climate Services (WGCS), Working Group on Hydrological Services (WGHS) and Working Group on WIGOS/WIS (WG-WIGOS/WIS). The progress reports of respective Working Groups are attached as Annex IV.

3.4 Work Plan for 2015–2016

3.4.1 The Group reviewed the Work Plan for 2015–2016 developed by the Chairpersons of the individual Working Groups as given in Annex V.

4. RA II OPERATING PLAN FOR 2016–2019

4.1 The Group noted that Cg-XVI requested the regional associations to: (a) provide regional needs and priorities that should be taken into consideration in developing the WMO Strategic Plan 2016–2019; (b) coordinate, as necessary, national contributions to regional aspects of the Plan; and (c) develop their own Operating Plans (OP) 2016–2019 in support of the implementation of the next WMO Strategic Plan.

4.2 The Group recalled that MG-7 decided to organize a small group within MG to discuss the inputs to WMO SOP 2016–2019. The Group also recalled that MG-8 agreed this group should include the WG/ICT chairpersons and be co-chaired by the vice president of RA II and the Chairperson of TT-SOP.

4.3 The Group agreed to rename the small group as *ad-hoc Task Team for the development of the RA II Operating Plan 2016–2019* (RA II TT-OP 2016-2019) and to include the Co-coordinators of Expert Groups in the Task Team.

4.4 The Group reiterated that the RA II OP 2016–2019 should be based on the challenges and future priorities in the Region, which were identified by the questionnaire survey and further discussion at the RECO-6. The Group requested the RA II OP 2016–2019 to retain only the specific deliverables to be implemented especially for the monitoring and evaluation purposes.

4.5 The Group requested the Co-chairpersons of RA II TT-OP 2016–2019 to further develop the RA II OP 2016–2019 in cooperation with the Technical Departments in the Secretariat and to submit the RA II OP 2016–2019 to the president of RA II for approval in consultation with MG members by the beginning of the next financial period.

5. REGIONAL ACTIVITIES IN 2015

5.1 The Group reviewed the budgeted regional activities in 2012–2015 proposed by the Secretariat, as listed in Annex VI.

5.2 The Group noted that the League of Arab States (LAS) Forum on Capacity Development of Meteorology and Climate Services in the LAS Region was convened on 28 and 29 April 2015 in Jeddah in the Kingdom of Saudi Arabia hosted by the Presidency of Meteorology and Environment (PME) in conjunction with the LAS Permanent Committee on Meteorology (26–27 April 2015) and the LAS Meeting of Ministers responsible for Meteorology (30 April 2015). The Group noted that the aim of the Forum was to build awareness of the need to strengthen the NMHSs in the LAS region and how to advance regional cooperation through the establishment of technical and financial mechanisms which support the development and implementation of a capacity development strategy of meteorological and climate services in the LAS region.

5.3 The Group was informed that the Regional Forum on Meteorological Services for Aviation Safety in Southeast Asia was held on 29–30 April 2015 in Jakarta, Indonesia, in order to identify and build a collaborative mechanism among the aviation community including NMHSs, air traffic services and airlines for improving the aeronautical meteorological services as a contribution to the aviation safety, regularity and efficiency in the region.

5.4 The Group was pleased to note that the Joint RA II/RA V Workshop on WIGOS for Disaster Risk Reduction was scheduled to be held on 13–15 October 2015. The Group also noted that the Workshop aimed to enhance the observing capabilities and data exchange within the region, which could contribute significantly to weather related disaster risk reduction in that area.

5.5 The Group expressed its condolence and profound sympathy to people who have been affected by the earthquake, which occurred in Nepal on 25 April 2015 with a magnitude of 7.8. The Group was informed that a letter of condolence from WMO Secretary-General was sent to the Ambassador of Permanent Mission of the Federal Democratic Republic of Nepal to the United Nations Office as well as the Permanent Representative of Nepal with WMO. The president of RA II also sent a letter of condolence to the Permanent

Representative of Nepal with WMO. The Group requested the Secretary General of WMO, in coordination with Members, to provide possible technical support to the Nepal Department of Hydrology and Meteorology for reconstruction of its continuous operational meteorological services.

5.6 The Group noted that Permanent Representative of China with WMO sent a condolence letter to Permanent Representative of Nepal with WMO. The Group appreciated China for providing technical support by CMACast (satellite-based data broadcast system based on DVB-S2 technology) and Meteorological Information Comprehensive Analysis and Process System (MICAPS) system which had served as its main weather forecast platform within the first 24 hours after earthquake when the local Internet failed. The Group further appreciated India for their efforts to contribute to the improvements in the meteorological services in South Asian countries including Nepal through capacity development activities.

5.7 With deep condolence for the disaster in Nepal due to the earthquake, the Group requested the Chairperson of the RA II Implementation and Coordination Team on Disaster Risk Reduction (ICT-DRR) to prepare a Strategic Plan for Emergency Response in RA II in consultation with relevant Technical Departments in the Secretariat for further discussion in the upcoming WG Chairs' Meeting for the discussion on the RA II OP 2016–2019 proposed by the Secretariat. The Group was informed with appreciation that the WG Chairs' Meeting would be hosted by Qatar, tentatively in December 2015.

6. SIXTEENTH SESSION OF REGIONAL ASSOCIATION II

6.1 The Group considered the tentative schedule of holding the sixteenth session of Regional Association II (RA II-16) in 2016 considering the schedule of other sessions of WMO constituent bodies during the next fiscal period 2016–2019, which is available at https://docs.google.com/a/wmo.int/file/d/0B8DhC1GSWSmxd0hVM0Myd2FIRlU/edit.

6.2 The Group requested the Secretariat to contact the Members in RA II to identify the host country, the venue and tentative dates of RA II-16 in consultation with the host country.

6.3 The Group recommended that the dates of the RA II-16 be decided in consideration of sufficient separation from other major international meetings such as the Conference of Parties to the United Nations Framework Convention on Climate Change.

7. OTHER BUSINESS

7.1 The Group was informed of the progress of relocation of Regional Office for Asia and the South-West Pacific (RAP). The Group noted that the site visits to the selected candidates for the hosting of RAP Office, including Doha, Jakarta and Singapore, had been finished and a draft recommendation would be prepared for the consideration of the Secretary-General.

8. CLOSURE OF THE SESSION

8.1 The president thanked all the participants for their fruitful discussion and expressed his satisfaction with the outcomes made in the session. He also thanked the WMO Secretariat for the arrangements for the session.

8.2 The ninth session of the RA II Management Group closed at 14:30 on 27 May 2015. The list of participants is attached as Annex VII to this report.

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ANNEX I

NINTH SESSION OF THE RA II MANAGEMENT GROUP
(Geneva, Switzerland, 27 May 2015)

AGENDA

1. Organization of the Session

2. Matters arising from the Eighth Session

3. Outcomes of the Sixth Regional Conference on Management of National Meteorological and Hydrological Services in Regional Association II

   3.1 Challenges and future priorities

   3.2 Survey on institutional arrangements for NMHSs and identification of future priorities: updates for LDCs

   3.3 Progress report of the Working Groups

   3.4 Work Plan for 2015–2016

4. RA II Operating Plan 2016–2019

5. Regional Activities in 2015

6. Sixteenth session of Regional Association II

7. Other Business

8. Closure of the Session

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ANNEX II

RECOMMENDATIONS ON THE CHALLENGS AND FUTURE PRIORITIES OF RA II FOR CONTRIBUTION TO WMO SOP 2016–2019

The challenges and future priorities for RA II Members were identified by the regional survey and further discussed during the RECO-6. The highest priority challenges identified in these discussions include:

- Inadequacies of climate services, extended forecast (sub-seasonal to seasonal) at high resolution;
- The lack of qualified personnel and needs for capacity building;
- Need for ongoing competency assessments and implementation of a quality management system, particularly in the field of aeronautical meteorology;
- Need to improve development, access and usage of numerical weather prediction (NWP) guidance material as underlying support to prepare skilful, location-specific weather forecast for improving service delivery; and
- Inadequate capabilities (meteorological, hydrological observing systems, data communication systems and effective dissemination systems) to deliver end-to-end multi hazard early warning systems to support DRR;

and the future priorities include:

- **Improvement of Early Warning System (EWS) for Disaster Risk Reduction (DRR)** to meet the increasing demands for effective and more accurate location- and time-specific forecasts for stakeholders to issue early warning and render emergency services;
- **Implementation of WIGOS and WIS including GISC** to maintain and improve real-time observing systems including META data, the quality and quantity of observations (particularly in mountains, deserts and oceans), improve communication and information sharing, telecommunication and IT infrastructures and database management, regional and national implementation of WIGOS;
- **Enhancement of Hydrological, Aviation and public weather services** for the development of the capacity for adequate services in support of public weather services, aviation, and hydrology, including nowcast, short and medium-range forecast services;
- **Strengthening of Climate Services including GFCS** for improved climate services including climate change, variability and prediction services; and the implementation of GFCS at national and regional levels;
- **Capacity Development** in terms of budget and staffing resource deficiencies, education and training needs, twinning of experts and modeling such as NWP; and
- **Improvement of Quality Management System (QMS)** in terms of training and education in support of implementation of personnel qualification, competency and QMS to leverage cost-recovery systems to improve aviation services.

ANNEX III

SURVEY REPORT

ON

INSTITUTIONAL ARRANGEMENTS, CHALLENGES AND PRIORITIES

FOR THE LEAST DEVELOPED COUNTRIES (LDCs)

IN REGIONAL ASSOCIATION II (ASIA)

WORLD METEOROLOGICAL ORGANIZATION

MAY 2015

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Executive Summary

A supplementary analysis was made to identify challenges and future priorities of the Least Developed Countries (LDCs) in WMO Regional Association II (RA II). The analysis was based on survey conducted to collect information on the institutional arrangements for the national provision of hydrometeorological services and to identify the most important challenges and priorities of RA II Members as a whole. The overall result of the survey was compiled in the Survey Report on Institutional Arrangements, Challenges and Priorities in Regional Association II (Asia)[2], which was published in December 2014.

As to institutional arrangements, all National Meteorological and Hydrological Services (NMHSs) of LDCs are the government entities and work under a variety of different parent organizations with different degrees of autonomy. Four LDCs are functioning under a decree and three are functioning without legal instruments.

With respect to human resources, five LDCs have less than 30% of staff members holding education qualifications at the university degree level or higher, whilst over 62% of all staff members in RA II possess university degree.

In regards to the management of NMHSs, all LDCs are government or state-owned enterprises providing public weather services without commercial activities. All LDCs have development/strategic plan in place covering the next 3-5 years and enhancing the monitoring infrastructure is identified as one of the priority areas in the plans.

NMHSs deliver a broad range of services: agrometeorological services, aviation services, climate services, warning services and Public Weather Services (PWS) are provided by all LDC Members. All LDCs reported concerns to surface observations (Land) in terms of adequacy of monitoring infrastructure.

Challenges and priorities

The challenges identified by LDCs include adequacy of qualified personnel, introduction and maintenance of Quality Management System (QMS), and improved visibility toward the decision makers, whereas the challenges selected by RA II Members in the survey are adequacy of qualified personnel, climate services and NWP modeling capacity. The average scores representing the degrees of challenge of each area for LDCs were all higher than those for the whole RA II. The priority areas identified by LDCs are WIGOS-WIS including GISC, capacity development, enhancement of services delivery, improvement of QMS and climate service including GFCS.

[2] http://www.wmo.int/pages/prog/dra/documents/RAII-RECO-6-surveyrepot.pdf

Suggestions for RA II activities

Financial and staffing constraints are the main challenges that limited LDCs to participate in regional activities and working bodies. LDC Members expect from other Members for technical support and exchanges of expertise. LDCs also identified the needs for training and mobilization of experts as a key expectation from the WMO Secretariat.

1. Introduction

RA II is composed of 35 Member countries and territories in Asia. Among them, eight Member Countries are designated as LDCs by the United Nations[3]: Afghanistan, Bangladesh, Bhutan, Cambodia, Lao People's Democratic Republic, Myanmar, Nepal and Yemen. Their geographical sub-regions are listed in Table 1.1. Analysis of this report was based on the responses received from all LDCs in RA II but Bhutan in this survey. This supplementary analysis identified the challenges and future priorities of LDCs in RA II (Asia).

Table 1.1: LDCs in RA II

Member	Sub-region
Afghanistan	South Asia
Bangladesh	South Asia
Bhutan	South Asia
Cambodia	South-East Asia
Lao People's Democratic Republic	South-East Asia
Myanmar	South-East Asia
Nepal	South Asia
Yemen	West Asia

2. Institutional arrangements

The purpose of this section is to present basic information about the NMHSs of LDCs, including the position of the NMHS within government, as well as the role and mandate of the NMHS in the provision of services.

[3] http://www.un.org/en/development/desa/policy/cdp/ldc/ldc_list.pdf

2.1 Title and parent organization

NMHSs of LDCs operate under various titles and functional definitions, as described in Table 2.1.

Table 2.1: Formal title of NMHSs in local languages and English

Member	Title of NMHSs in local languages and English
Afghanistan	Afghanistan Meteorological Authority (AMA)
Bangladesh	Bangladesh Meteorological Department
Cambodia	Department of Meteorology
Lao People's Democratic Republic	ກົມອຸຕຸນິຍົມແລະອຸທົກກະສາດ Department of Meteorology and Hydrology (DMH)
Myanmar	Department of Meteorology and Hydrology
Nepal	जलतथामौसमबिज्ञानविभाग Department of Hydrology and Meteorology
Yemen	الهيئهالعامهللطيرانالمدنيوالارصاد - قطاعالارصادالجويه Civil Aviation and Meteorology Authority

Table 2.2 presents the parent organization and its legal status under which NMHS is currently operating.

Table 2.2: Parent organization and legal status of NMHS

Member	Title of the parent organization	Legal status of the NMHS
Afghanistan	Ministry of Transport and Civil Aviation	Authority
Bangladesh	Ministry of Defense	Department
Cambodia	Ministry of Water Resources and Meteorology	Department
Lao People's Democratic Republic	Ministry of Natural Resources and Environment	Department
Myanmar	Ministry of Transport	Department
Nepal	Ministry of Science, Technology and Environment	Department
Yemen	Ministry of Transportation	Sector (State Owned Enterprise)

2.2 Functional scope and legislative arrangements

NMHSs possess a range of functions and often provide services across a number of areas in addition to meteorology, including hydrology, oceanography and seismology. As for operational hydrological services, four LDCs are responsible for operational hydrological services whilst three are not. With respect to aeronautical meteorological services, all LDC Members are meteorological authority and the service provider for aviation sector.

Regarding the legal instruments for the establishment and function of the NMHS, four LDCs operate under a decree and three operate without dedicated legal instruments. Two LDCs reported that specific legislation relevant to the NMHS is under formulation and expected to be enacted by government soon. Where legislation does not exist, the need for assistance in developing such legislation should be assessed. Details are given in Table 2.3.

Table 2.3: Institutional arrangements for hydrological/aeronautical meteorological services and legal instruments for meteorology

Member	Hydrological services	Aeronautical Meteorological services	Legal instruments
Afghanistan	X	X	Decree
Bangladesh	-	X	-
Cambodia	-	X	Decree
Lao People's Democratic Republic	X	X	Decree
Myanmar	X	X	-
Nepal	X	X	Decree
Yemen	-	X	-

3. Management and organization

This section summarizes the status of management and organizational capacities of LDCs in terms of human and financial resources, scope of services, and business model.

3.1 Human resources

The level of qualifications and work experience of staff and their strength in number indicate the overall capacity of the institution. Five LDCs have less than 30% of staff members holding education qualifications of the university degree level or higher, whilst over 62% of all staff members in RA II possess university degree.

Regarding the trend of staffing in NMHSs in LDCs during recent 3-5 years, four LDCs reported no significant change whereas three LDCs reported an increase in numbers. The responses are shown in Table 3.1.

Table 3.1: Education and the trends of staff numbers

Member	Total staff	Staff with higher degree (%)	Trends of staff numbers
Afghanistan	147	20 (14%)	No significant change
Bangladesh	1,250	350 (28%)	Steadily increasing
Cambodia	45	13 (29%)	Steadily increasing
Lao People's Democratic Republic	74	26 (35%)	No significant change
Myanmar	759	504 (66%)	Steadily increasing
Nepal	239	35 (15%)	No significant change
Yemen	232	48 (21%)	No significant change

3.2 Budgetary provision in year 2013-2014

National Government is the main source of budget for NMHSs in RA II. All LDC Members also receive budget from government. In addition to regular government budget, many NMHSs receive additional extra budgetary fund in the form of project funded by international agencies, national agencies and research projects. Except Afghanistan, all LDC Members in RA II receive projects fund from international agencies whereas four LDCs received projects fund from national agencies. Two LDCs reported they have research projects fund. The responses are shown in Table 3.2.

Table 3.2: Funding Sources of NMHS Budget

Member	Projects funded by international agencies	Projects funded by national agencies	Research projects
Afghanistan	-	-	-
Bangladesh	X	X	-
Cambodia	X	X	-
Lao People's Democratic Republic	X	-	-
Myanmar	X	-	-
Nepal	X	X	X
Yemen	X	X	X

3.3 Scope of services

Members were asked to identify the main areas of responsibility of NMHS. All respondents reported the provision of meteorology and climate services as an operational responsibility. Table 3.3 summarizes the range of operational services provided by each NMHS of LDCs. Myanmar and Nepal specified the additional responsibilities of agrometeorology and glaciology and Glacial Lake Outburst Flood (GLOF), respectively.

Table 3.3: Scope of services provided by NMHS

Member	Meteo-rology	Hydr-ology	Clima-te	Air/ Water quality	Tsuna-mi	DRR/ DRM	Seism-ology	Ocean-ogra - phy	Others
Afghanistan	X	X	X	X	-	X	-	-	
Bangladesh	X	-	X	-	X	-	X	-	
Cambodia	X	-	X	-	-	-	-	X	
Lao People's Democratic Republic	X	X	X	-	-	-	X	-	
Myanmar	X	X	X	-	X	-	X	-	Agro- mete-orology
Nepal	X	X	X	X	-	X	-	-	Glaciology, GLOF mitigation
Yemen	X	-	X	-	X	-	-	-	

3.4 Business model and NMHS Quality Management Programme

The survey examined the business model under which each NMHS operates. All LDCs have Government/State owned enterprises providing public weather services without commercial activities.

For the NMHS Quality Management Programme, two LDCs have implemented Quality Management system (QMS) across their whole NMHS, including for aviation, whilst three have implemented QMS for aviation services only and two reported an absence of QMS frameworks. The responses are shown in Figure 3.1.

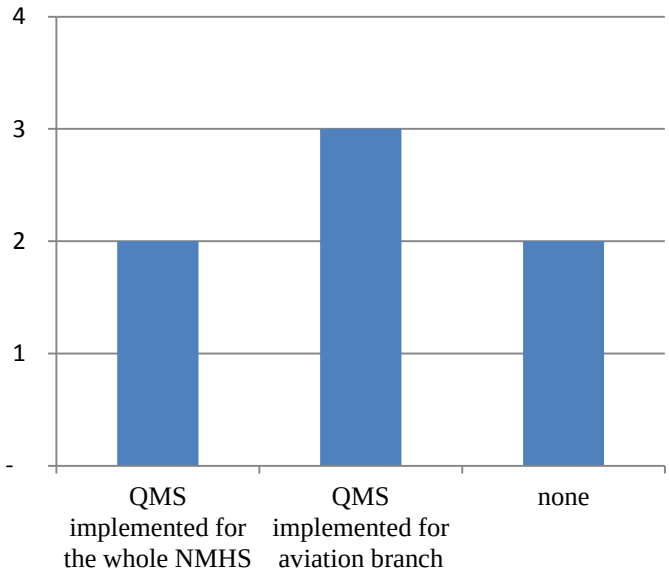

Figure 3.1: QMS implementation status

3.5 Development/strategic plan for next 3-5 years

The survey examined the extent to which LDCs had strategic plans or national development plans in place that identifies the priorities of the NMHSs over the next 3-5 years. All LDCs responded enhancing the monitoring infrastructure as a priority area in these plans, followed by improved IT, extending services to new user sectors, enhanced climate services, and improving operational forecast, which were reported by six out of seven LDCs. More than half of LDCs responded training, education and capacity building of staff, automation of the observing networks, research and development, and implementation of WIS as priority areas. Details are given in Figure 3.2.

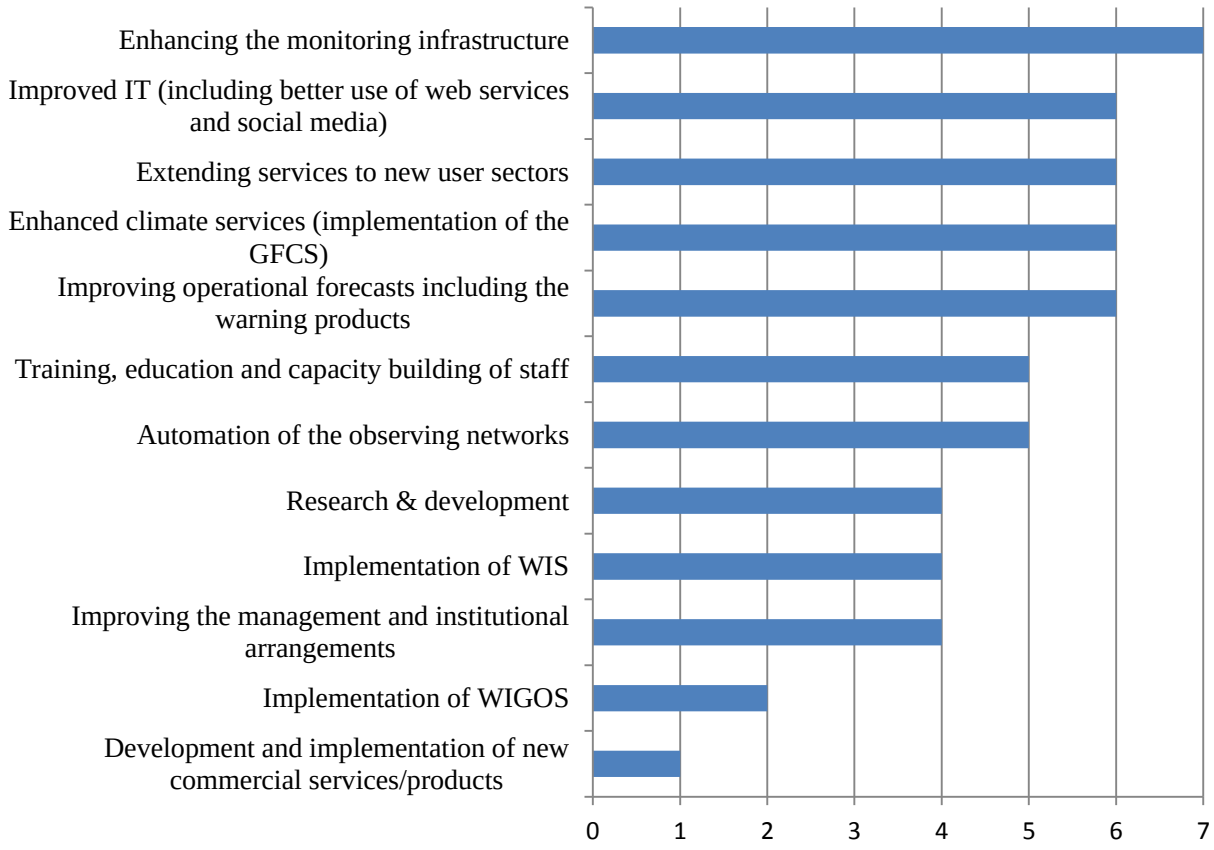

Figure 3.2: Priority areas of development/strategic plan

4. Operations and services

This section provides a summary of the scope of services delivered by LDCs and the areas of attention in terms of coverage and meeting the needs of users.

4.1 Types of service provisions

Figure 4.1 summarizes the different types of services provided by LDCs in RA II. Agrometeorological services, aviation services, climate services, warning services and Public Weather Services (PWS) are provided by all LDC Members and hydrological services are provided by most LDCs. Meanwhile, a small number of LDCs reported that they provided tsunami services, volcano services and air/water quality services.

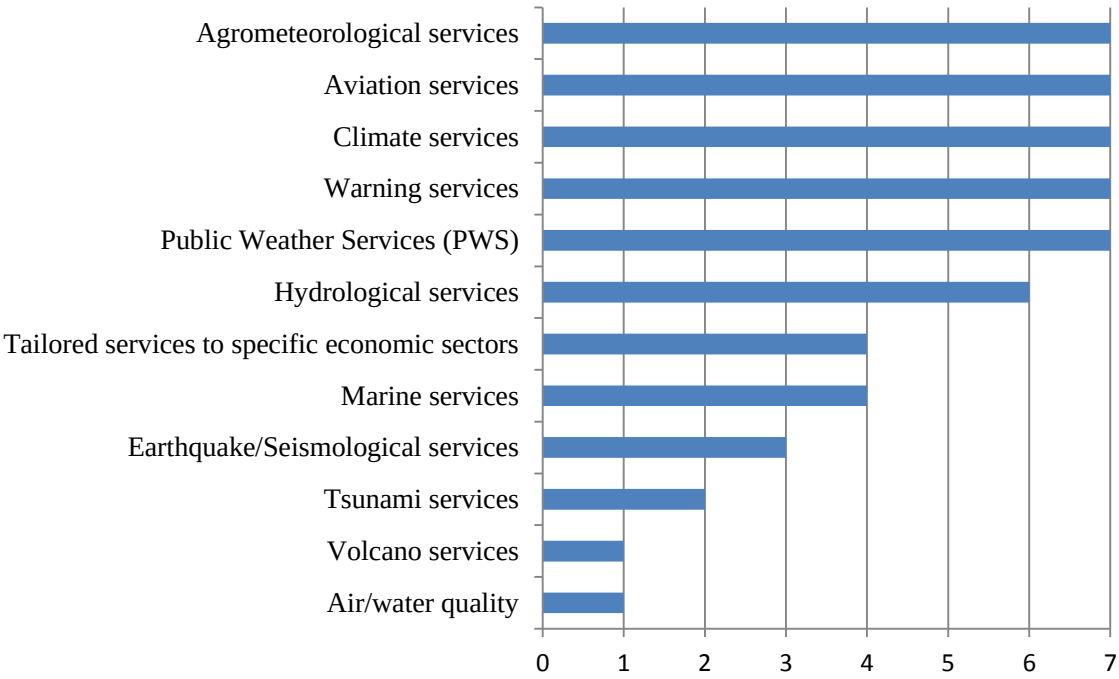

Figure 4.1: Type of services provisions

4.2 Current level of service provisions

An assessment of the adequacy of service provision was provided by respondents and is summarized in Figure 4.2. None of the services is rated as "advanced" by LDCs. Warning service is rated as "satisfactory" by a majority of Members, whereas agrometeorological services is rated as "poor" by three LDCs. Air/Water quality services is applicable to only two LDCs, which is rated as "poor" by both Members.

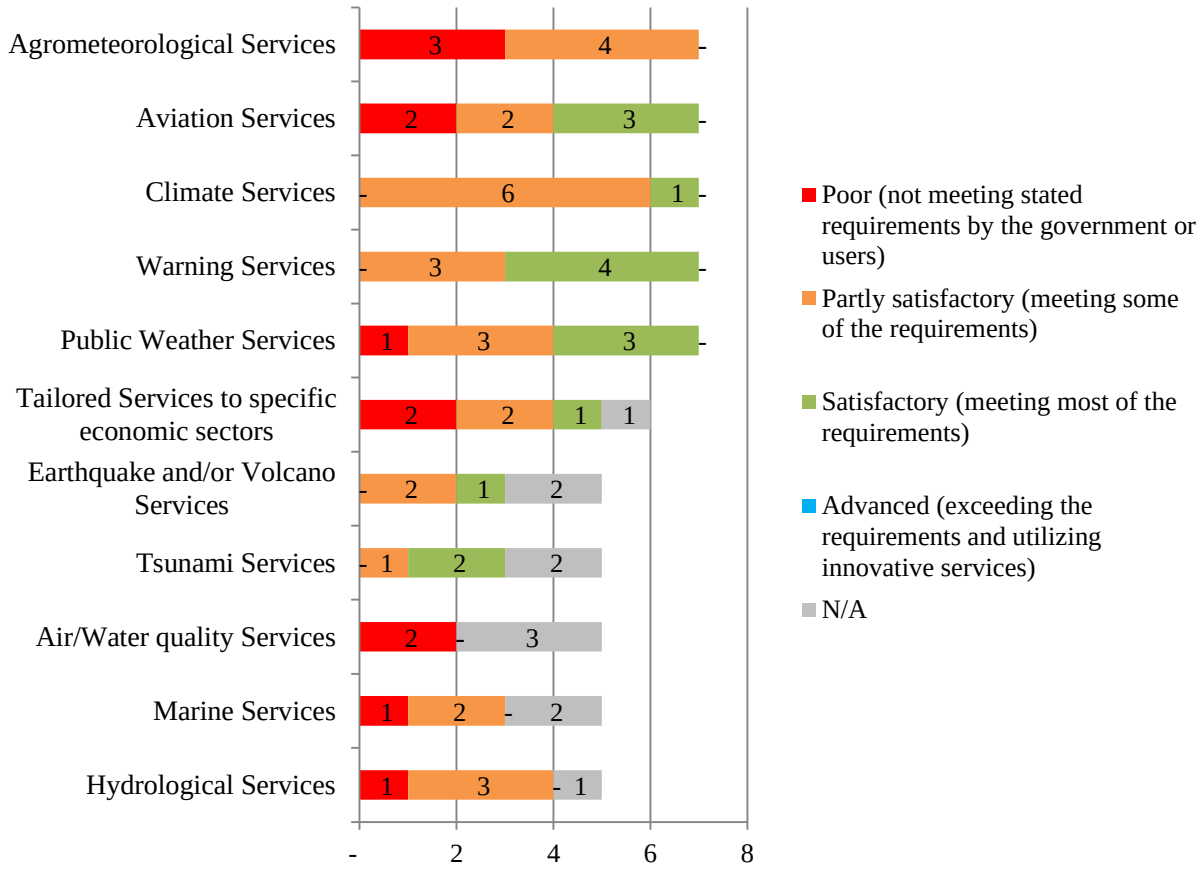

Figure 4.2: Current level of service provisions

Respondents were also asked to rate the adequacy of national research capability to support service delivery. There is no research area rated as advanced level. Research in support of aviation services was rated as "satisfactory" by three LDCs.

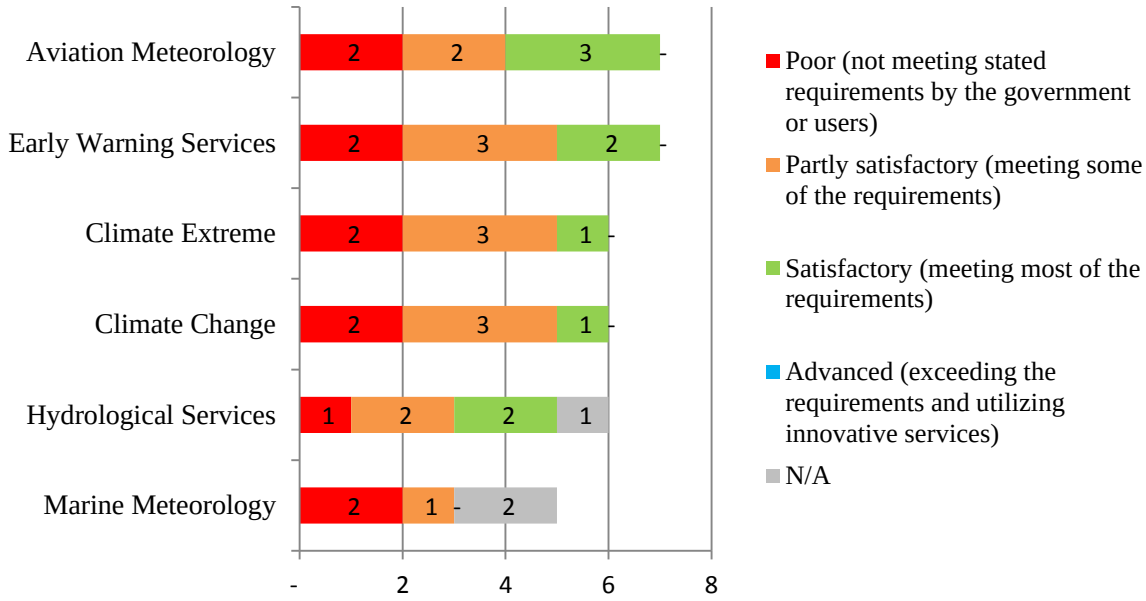

Figure 4.3: Level of research capabilities and development areas

4.3 Adequacy of monitoring infrastructure

Members were asked to rate the inadequacy of monitoring infrastructure. All LDCs reported the surface observations (Land) as inadequate. Concerns about weather radar observations, upper-air observations, data management systems, agrometeorological observations and automation of the observing networks were also widely reported. These results are shown in Figure 4.4.

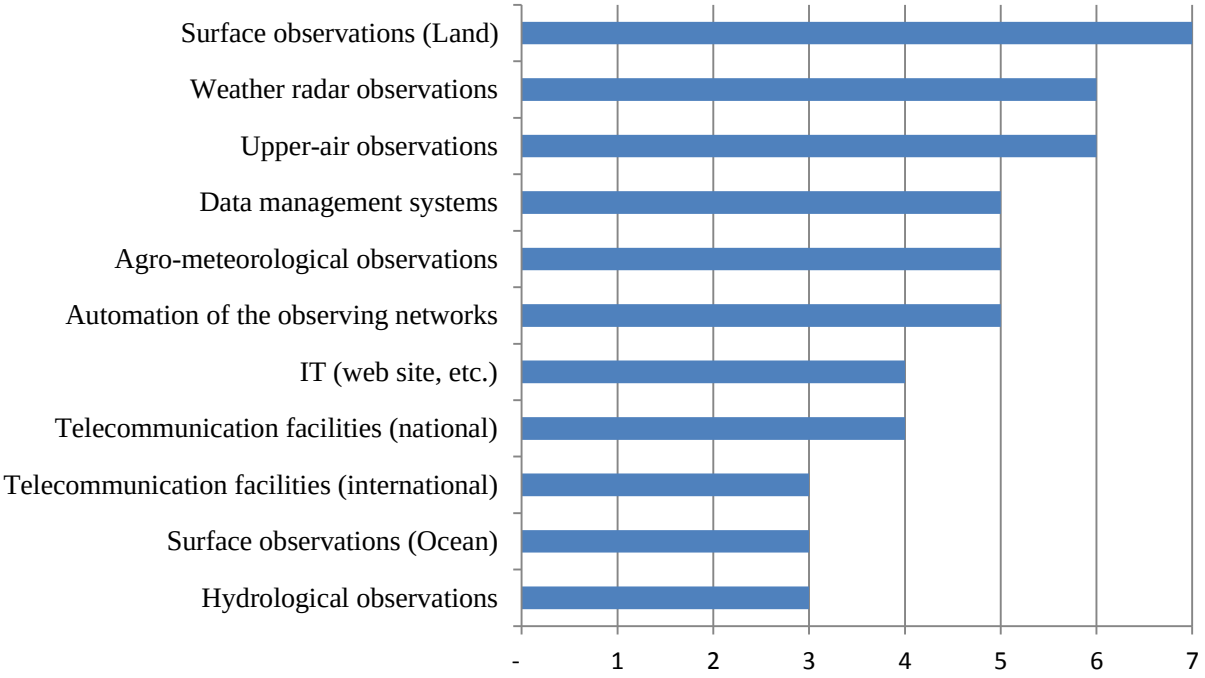

Figure 4.4: Inadequacy of equipment and infrastructure

4.4 Forecasting capacity and Early Warning System

The Survey concluded its section on operations and services with an assessment of the adequacy of staffing levels to deliver 24 hr-7days operational services and also whether the NMHS has early warning systems in place. Regarding the forecast capacity and early warning system, all LDCs but two reported they have early warning systems in place. On the other hand, four out of seven LDCs reported that they did not have sufficient staff to maintain around-the-clock operations. The results are summarized in Figure 4.5.

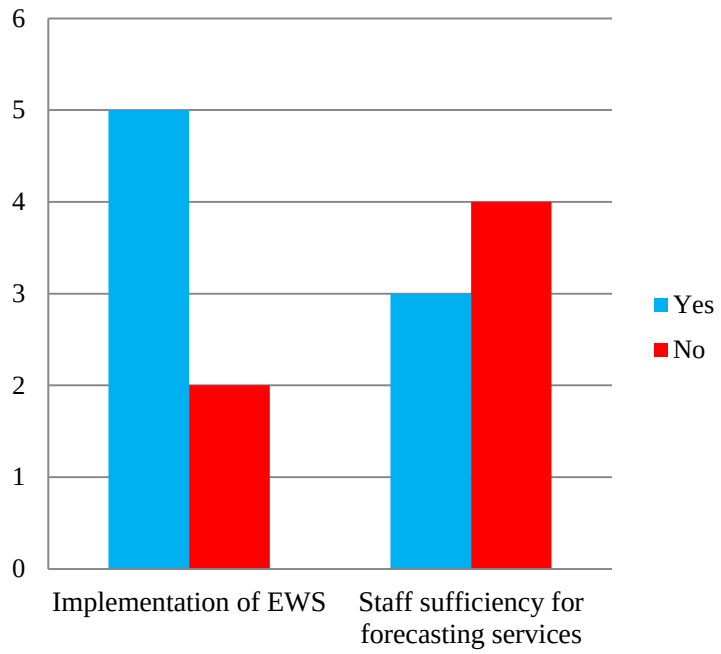

Figure 4.5: Forecasting capacity

5. Challenges and priorities

This section examines the major NMHS challenges and the priority actions for the next 3-5 years.

5.1 Challenges

Members were asked to identify the most pressing challenges from a list of 12 predefined categories by rating the extent of the challenge on a 5-point scale (1 = no challenge; 2 = slight challenge; 3 = moderate challenge; 4 = moderate/serious challenge; 5 = serious challenge). The scores were then tallied and averaged to produce a list that illustrates the most significant challenges facing LDCs in order of significance.

The average scores of individual categories for LDCs were all higher than those for the whole RA II. The differences of average scores between LDCs and RA II range from 0.022 to 0.883. The most significant/widespread challenges identified by LDCs were: adequacy of qualified personnel, introduction and maintenance of QMS, and improved visibility toward the decision makers. Other challenges such as adequacy of the existing observing system, adequacy of EWS services for DRR, adequacy of NWP modeling capacity, anticipated staff cuts, adequacy of climate services, anticipated budget, and relationship with private sector were equal to or higher than value of 3.000. Only data policies and adequacy of telecommunication facilities and capacity were rated as below value of 3.000. Details are shown in Figure 5.1.

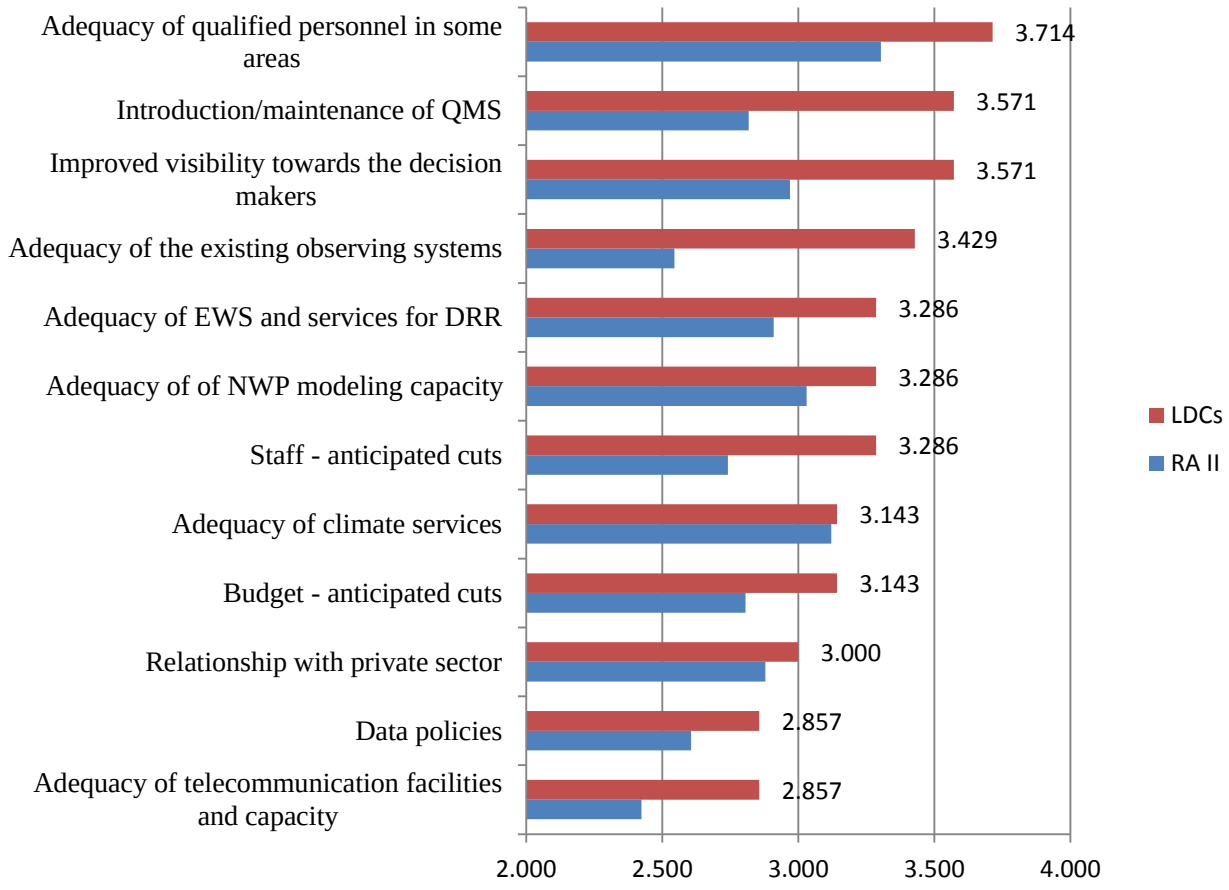

Figure 5.1: Challenges

5.2 Future priorities

Respondents were asked to identify up to six priority areas for future work to help address the challenges identified above. Free text was used for responses and a degree of interpretation was used to summarize this information and map it to the following eight priority areas.

The scores were then tallied by rating the extent of the priority on a 6-point scale (1 = sixth priority; 2 = fifth priority; 3 = fourth priority; 4 = third priority; 5 = second priority; 6 = first priority) to produce a list that illustrates priorities facing LDCs in order of significance.

Table 5.1 provides the comparative priority areas based on weighted value weighing top priority as highest value of 6 and decreasing subsequently. The priority areas selected by LDCs are WIGOS-WIS including GISC, capacity development, enhancement of services delivery, improvement of QMS and strengthening of climate services including GFCS. The priorities reported by RA II Members in the survey are WIGOS-WIS including GISC, capacity development, strengthening of Climate Services including GFCS, enhancement of services delivery and Disaster Risk Reduction/Early Warning System. The priorities selected by both LDCs and RA II are almost same. Disaster Risk Reduction and Early Warning System, which is the top priority for RA II, were not considered as an important priority for LDCs based on the weighted value however two countries chose it as high priority.

Table 5.1: Priority areas based on weighted value

	Priority Areas	Priority						Response Frequency	Weighted Value
		1	*2*	*3*	*4*	*5*	*6*		
1	WIGOS-WIS including GISC	2	1	0	2	-	2	7	**25**
2	Capacity development	1	2	2	-	-	-	5	**24**
3	Enhancement of services delivery	1	2	1	-	1	2	7	**24**
4	Improvement of QMS	1	1	1	1	3	-	7	**24**
5	Strengthening of Climate Services including GFCS	1	-	2	2	1	-	6	**22**
6	Disaster Risk Reduction/Early Warning System DRR/EWS	-	1	1	-	-	-	2	9
7	Scientific research	-	-	-	2	1	1	4	9
8	Strengthening good governance	1	-	-	-	-	1	2	7

6. Suggestions for the RA II activities

This section summarizes expectations and suggestions of LDCs in terms of participation in subsidiary bodies, and support from the other Members and the Secretariat for improvement of RA II activities.

6.1 Participation in subsidiary bodies

Members were asked to determine their ability to participate in the working mechanisms (Working Groups, Task Team, etc.) of RA II (Multiple answers were allowed). Figure 6.1 shows that the majority of responses indicate that participation in this work is only possible with financial support from WMO. Only one mentioned that there is no possibility to allocate staff to support regional activities. It was also reported that budget constraint and insufficient staff in NMHSs were the main hindrance to support the activities of RA II subsidiary bodies.

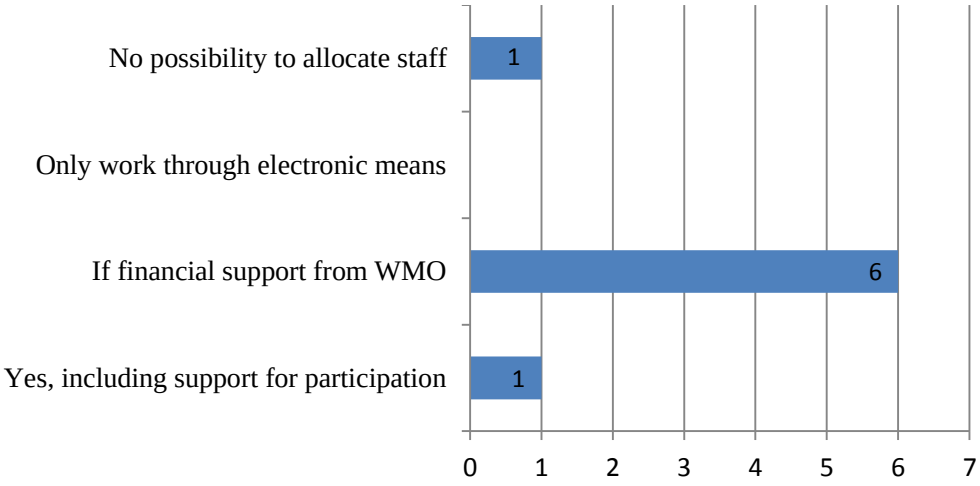

Figure 6.1: Support to subsidiary bodies

Members were asked to identify the main outcomes they seek from the work of the RA II subsidiary bodies, using a 3-point scale (1 = not useful; 2 = useful; 3 = very useful). A clear preference for LDCs was expressed for two types of activities: regional capacity development events such as forum, seminar/conference/workshops, cooperation and partnership, and assisting in setting up implementation projects. The useful activities of subsidiary bodies of RA II are summarized in Figure 6.2.

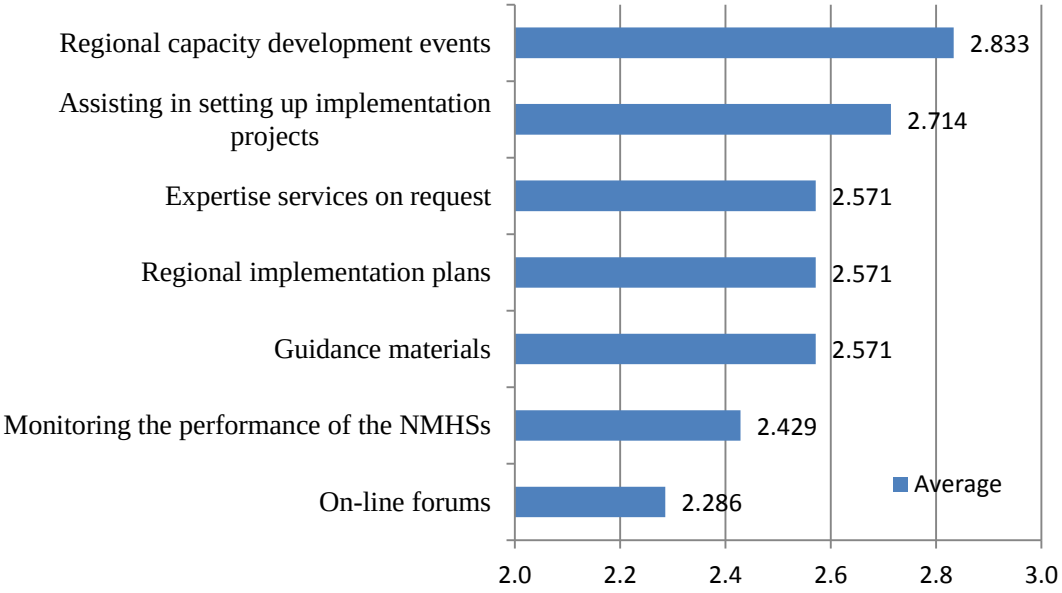

Figure 6.2: Useful activities of RA II subsidiary bodies

6.2 Support from Members and Secretariat

This part examines the kind and level of support sought by LDCs from the WMO Secretariat and other Members.

With regard to the support from Members, although there was a wide range of responses, the strongest emphasis was on technical support, exchanges of expertise, training, joint/twinning capacity development projects and assistance in developing and/or strengthening regulation and procedures.

Similarly, LDCs identified the needs for training as a key expectation from the WMO Secretariat. Some of the responses from LDCs indicated that the Secretariat should make arrangements for sending experts from advanced NMHSs who can help with operational services of LDCs and for providing LDCs with opportunities to visit advanced NMHSs to learn their operational services.

Specific suggestions focused on continued assistance with information sharing on regional activities and more applicable practical guidelines for LDCs to implement WIS/GISC, GFCS and QMS.

ANNEX IV

WMO Regional Association II (Asia)
Progress Reports of Working Groups

May 2015

CONTENTS

Working Group on Weather Services (WGWS)

B.L. Choy
Hong Kong Observatory

1. Introduction

This report summarizes major activities in association with the expert groups, viz Expert Group on Aeronautical Meteorological Services Delivery (EG-AeM), Expert Group on Operational Forecasting (EG-OF) and Expert Group on Public Weather Services (EG-PWS), during the period 2013-14.

2. Working Group Structure

The Working Group is composed of Expert Group on Aeronautical Meteorological Services Delivery (EG-AeM), Expert Group on Operational Forecasting (EG-OF) and Expert Group on Public Weather Services Delivery (EG-PWS). Each EG consists of two co-coordinators and several theme leaders.

3. Terms of Reference

The terms of reference of the Working Group on Weather Services (WGWS) are as follows:

(a) To coordinate and support the work of the expert teams in Aeronautical Meteorology in the Region in cooperation with the Commission for Aeronautical Meteorology;
(b) To coordinate all activities related to the GDPFS, including the Emergency Response Activities, and PWS in the Region in cooperation with the Commission for Basic System;

4. Membership

Expert Group on Aeronautical Meteorological Services Delivery (EG-AeM)

EG-AeM		
Co-Coordinators	Mr Boon-leung Choy	Hong Kong, China
	Ms Marina Petrova	Russian Federation
Theme Leader in QMS Implementation and Maintenance	Ms Jie Shao	China
Theme Leader in Competency Assessment	Mr Manoj Kumar Bhatnagar	India
Theme Leader in Meteorological Support to Air Traffic Management and Provision of SIGMETs	Mr Jun Ryuzaki	Japan

Expert Group on Operational Forecasting (EG-OF)

EG-OF		
Co-Coordinators	Mr Yuki Honda	Japan
	Ms Irina Zaytseva	Uzbekistan
Theme Leader in Operational Forecasting Process and Support	Ms Sunitha D. Santhamma	India
	Mr Vo Van Hoa	Viet Nam
Theme Leader in Operational Predictions from sub-seasonal to longer-time scale	Mr Suhee Park	Republic of Korea
Theme Leader in Emergency Response Activities	Mr Masami Sakamoto	Japan

Expert Group on Public Weather Services Delivery (EG-PWS)

EG-PWS		
Co-Coordinators	Mr Lap-shun Lee	Hong Kong, China
	Dr Muhammad Hanif	Pakistan
	Mr Alexey Lyakhov	Russian Federation
Theme Leader in Socio-economic Benefits of Meteorological and Hydrological Services	Mr Jinjun Pan	China
Theme Leader in Delivery of Warning Services	Mr Chuanhai Qian	China
Theme Leader in Education and Public Outreach related to PWS	Dr Seonkyun Baek	Republic of Korea

4. Expert Group on Aeronautical Meteorological Services Delivery (EG-AeM)

A meeting of the expert group was held during 10-12 November 2014 in Hong Kong, China. Apart from the Co-coordinators and the Theme Leaders, three additional experts from other Members of RA II were invited to the meeting. Although two of the participants, including the Theme Leader in Competency Assessment (India) and an invited expert (Kazakhstan), were unable to attend the meeting in the end, the meeting still had a reasonable sub-regional representatives of RA II (China; Hong Kong, China; Japan; Kuwait; Russian Federation; Thailand).

Four major areas were discussed during the meeting, they were (i) Review of the outcome of the conjoint ICAO MET Divisional and WMO CAeM meeting in July 2014, (ii) Status of implementation of high priority items in RA II, (iii) Proposal for regional follow up actions and (iv) Coordination of regional aeronautical meteorological services delivery events. Generally speaking, the NMHSs in RA II had great discrepancies in capabilities; while some of them were working on exciting new developments, some of the others were still having

deficiencies in the provision of METAR, TAF and SIGMET. This could be one of the reasons why the progress of implementing Quality Management and Competency Assessment Systems, each of these requiring considerable knowledge and skills for sustainable development, was below expectation for the region as a whole when compared with more advanced regions like RA VI. This may also impact the regional ability to face the upcoming challenges in the provision of aeronautical meteorological services for the future global air navigation system. One of the participants had showcased the positive outcome of twinning, arranged through bilateral agreement, in removing deficiencies of NMHS. The possibility of having more twining/mentoring activities in RA II would be further explored.

For more advanced NMHSs in RA II, activities to study and develop new technologies to support the future air navigation system had been started in close co-ordination with relevant Expert Teams of WMO Commissions and ICAO. They had also demonstrated their current abilities to provide new services including space weather and regional hazardous weather advisory services. At the same time, the participants were aware of the evolving requirements of users for the provision of sub-regional aviation meteorological services in a global sense, and the rise of the big data concept which made the value of data and value-added services diverge further. It was recognized that partnership among NMHSs through MOU or bilateral agreements may be able to extend the capabilities of individual NMHS to better serve the global needs of aviation users and worth further exploration.

The work plans of the Theme Leaders for 2013-16 were amended in accordance to the outcome of the meeting. The meeting also considered it essential to review the Terms of Reference of EG-AeM in response to the outcome of the conjoint meeting. However, since a master plan would be discussed at the upcoming meeting of the management group of CAeM in 2015, the meeting agreed to postpone the discussion until the outcome of the CAeM-MG became available.

During RECO-6, the co-coordinators summarized the outcomes of the meeting and would like to propose new points for possible inclusion to the WMO existing challenges and priorities on Meteorological Service for Aviation.

Please refer to Annex I-1 for the Action Item Log for follow up actions of the EG-AeM meeting, Annex I-2 for the updated Work Plan for EG-AeM (2013-16) and Annex I-3 for the proposed new points to be included in the challenges and priorities on Meteorological Service for Aviation.

5. Expert Group on Operational Forecasting (EG-OF)

The major activities for EG-OF involved those conducted by the Theme Leader on Emergency Response Activities. These include the development of a concise guidance of the nuclear environmental emergency response (EER) service and distribution to all Members of RA II, conduction of a survey by questionnaire jointly with WMO RAP Office to ask the non-registered members about their interest in the nuclear EER service, and RSMC Beijing, Obninsk and Tokyo to continue their efforts in maintaining contact information for the registered members.

Please refer to Annex II-1 for the report by the Theme Leader on Emergency Response Activities for 2014 and Annex II-2 for the updated Work Plan for EG-OF (2013-16).

The EG-OF is supposed to address issues mainly related the Global Data-Processing and Forecasting Systems (GDPFS) to assist the RA II Members to improve their operational forecasting services. While many EGs conducted the survey to capture the status of RA II in their related fields, the WMO Technical Progress Report on GDPFS and NWP Research is the best source to obtain such status information on GDPFS. However, the number of Members who submit this Progress Report is less than 10 every year. Although the EG-OF decides not to conduct a survey since it would load extra work to Members, it makes the EG-OF identify issues on GDPFS in RA II. The EG-OF will keep encouraging Members to submit the Progress Report to improve the current situation.

During the period 2015-2016, the EG-OF will focus on the following three activities: (1) support the implementation of two sub-regional projects in Southeast Asia and South Asia (Bay of Bengal) of the Severe Weather Forecasting Demonstration Project (SWFDP), (2) further promote the use of NWP data and products for the betterment of operational forecasting services, and (3) assist Members in preparation for the replacement of the Manual on GDPFS (WMO-No.485).

6. Expert Group on Public Weather Services (EG-PWS)

Communication among the Co-coordinators and Theme Leaders of the EG-PWS was mainly made through email exchange in 2013. A meeting of the EG-PWS was held in Doha on 3 December 2014 and a teleconference was held on 25 March 2015. In 2013, the work plan of EG-PWS for 2013-16 was formulated. Some of the proposed tasks were the development of guidelines on assessment of socio-economic benefits and communication with stakeholders. However, it was later found that similar guidelines were being prepared under other WMO programmes. Therefore, the EG-PWS would put more focus on the recommendations given in “The WMO Strategy for Service Delivery and its Implementation Plan” published by WMO in 2014. In this regard, the EG-PWS planned to organize a training workshop/seminar for RA II Members in 2015 on the enhancement of public weather service delivery.

Some of the activities on PWS carried out in this Region during 2013 and 2014 are summarized as follows. Two training workshops on public weather services were organized under the WMO/CBS Severe Weather Forecast Demonstration Projects (SWFDP). The first one was held in Macao, China from 15 to 19 April 2013 with participants from Cambodia, Lao, Thailand, Viet Nam, India, Maldives, Myanmar, Sri Lanka, Pakistan, Nepal, Bhutan, and others. The second one was held in Manila, Philippines from 9 to 13 June 2014 with participants from Cambodia, Laos, Thailand, Vietnam, and others. In addition, a Voluntary Cooperation Programme (VCP) training workshop on “Effective Media Communication” was organized in Hong Kong, China in December 2013 for Bhutan, Cambodia, China, Islamic Republic of Iran, Republic of Kazakhstan, Republic of Korea, Thailand and The United Arab Emirates. The workshop covered media communication in different phases of significant weather events, through various channels including the traditional media like TV and radio as well as new media like the social media. There were practical sessions of weather

presentation on TV and radio, which offered each participant hands-on experience together with expert feedback.

Please refer to Annex III for the updated Work Plan for EG-PWS (2013-16).

7. Pilot projects for RA II

All four pilot projects were in the implementation phase. Please refer to Annex IV for the updated Work Plan for Pilot Projects (2013-16).

8. Conclusion

After some deliberation, WGWS activities have started to gain momentum and associated works will move into top gear in 2015-16. More interactions among Members in RA II, Theme Leaders, Co-coordinators and Chairs with Expert Teams of WMO Commissions are expected. A WMO Google Group for WGWS has been set up and hopefully this could improve the sharing of information among different stakeholders.

WMO Regional Association II (Asia) Expert Group on Aeronautical Meteorological Services Delivery
Action Item Log

First meeting of the WMO RA II EG-AeM (Hong Kong, China, 10-12 November 2014)					
Action Item No.	**Action Item**	**Team Member Responsible**	**Target Date for Completion**	**Completed**	**Comments on Status of Outstanding Action Items**
1	Prepare an inventory showing existing collaborations among NMHSs in RA I	All members	On-going	N/A	
2	Revise EG-AeM work plan on QMS	Theme Leader on QMS Co-coordinators EG-AeM	Revision to be completed before RECO-6. Actions to be completed before congress		[30 Nov 2014] RA II work plan for 2013-16 updated
3	Secretariat to consider provide assistance including fact finding visits to those (QMS) Group A Members if reliable responses are not available	Secretariat	On-going	N/A	
4	Revise EG-AeM work plan on Competency Assessment	Theme Leader on Competency Assessment Co-coordinators EG-AeM	Revision to be completed before RECO-6. Actions to be completed before		[30 Nov 2014] RA II work plan for 2013-16 updated

			congress		
5	Further enhance the CAeM website to make online guidelines and information on competency assessment more accessible	Secretariat	End of 2014		
6	Request CAeM ET-GOV, as a high priority action, to provide some guidance (e.g. a plan on how to change the cost recovery model) on cost recovery in global scale	Secretariat Co-coordinators of EG-AeM	TBD		Need to consult Co-Chairs of ET_GOV to determine the schedule
7	Revise EG-AeM work plan on SIGMET	Theme Leader on SIGMET Co-coordinators of EG-AeM	Revision to be completed before RECO-6. Actions to be completed before congress		[30 Nov 2014] RA II work plan for 2013-16 updated
8	Contact DRA to confirm funding to initiate the preparation SIGMET workshop in Q1 2016	Theme Leader on SIGMET Co-coordinators of EG-AeM	ASAP		
9	Provide a contact point from RA VI for experience sharing on harmonization of SIGMET	Secretariat	ASAP		
10	Request ET-ETC to provide clear guidance on the necessary steps to be undertaken by Members and relevant training institutions to facilitate national implementation actions and resource planning	Co-coordinators of EG-AeM	TBD		Need to consult Co-Chairs of ET-ETC to determine the schedule

11	Follow up with the RA II focal point on the development of AMDAR Regional Implementation Plan (A-RIP)	China Co-coordinators of EG-AeM	ASAP		
12	Collect information on setting up of new / extension of national AMDAR programmes to cover data sparse areas on regional and sub-regional scale	All EG-AeM members	ASAP		
13	Request ET-ISA to prepare, on the schedule of implementation, a FAQ and/or practical guide on the implementation of AvXML	Co-coordinators of EG-AeM	TBD		Need to consult Co-Chairs of ET-ISA to determine the schedule
14	Gather national experience / examples / studies on effect of (climate) changes which may affect aviation operation and provide to ET-ASC for their study	All EG-AeM members	On-going	N/A	
15	Holding of a conference to raise the awareness of future challenges of aviation meteorological services	RA II MG / WGWS	RA II Session		
16	Hold teleconference on follow up items	All EG-AeM members	On-going	N/A	

Work Plan of EG-AeM (2013-16):

Task #	Reference	Task	Key Deliverable	Activity	2013	2014	2015	2016	Responsible	Status
AeM-1	EG-AeM (ToR(i))	a) Identify regional resource persons b) Identify regional national focal points of QMS c) Conduct a survey on the current implementation status of and challenges in maintaining QMS of each member (RKO: 1.2.5)	a) List of regional resource persons b) List of regional national focal points of QMS c) Survey report on current implementation status of and challenges in maintaining QMS in RA II	a) Identify regional resource persons b) Identify regional national focal points c) Carry out a survey on the current implementation status of and challenges in maintaining QMS of each member		X	X		Co-coordinators and Theme Leader in QMS Implementation and Maintenance	A restricted scope survey had been conducted in Jun 2014 and the results presented at the EG-AeM meeting.
AeM-2	EG-AeM (ToR(i))	a) Facilitate assistance from regional resource persons through twinning, etc. b) Conduct RA II workshop(s) on implementation and/or maintenance of QMS (RKO: 1.2.5, 6.3.3)	RA II workshop(s) on implementation and/or maintenance of QMS	a) Facilitate assistance from regional resource persons thorough twinning, etc b) Hold RA II workshop(s) on implementation or maintenance or both depending on the outcome of the survey			X	X	Co-coordinators and Theme Leader in QMS Implementation and Maintenance	

AeM-3	EG-AeM (ToR(ii))	a) Identify regional resource persons b) Identify regional national focal points of Competency Assessment c) Conduct a survey on the current implementation levels and maintaining the Competency Assessment programme. (RKO: 1.2.4)	a) List of regional resource persons b) List of regional national focal points of Competency Assessment c) Survey report on current implementation levels, with identified challenges in implementation and means to overcome the challenges .	a) Identify regional resource persons b) Identify regional national focal points of Competency Assessment c) Conduct a survey on the current implementation levels and maintaining the Competency Assessment programme.		X	X		Co-coordinators, Theme Leader in Competency Assessment, Regional Training Centers and Volunteer Experts	A draft survey form had been discussed at the EG-AeM meeting.
AeM-4	EG-AeM (ToR(ii))	a) Facilitate assistance from regional resource persons through twinning, etc b) Conduct RA II Workshop on Competency Assessment of AMP (RKO 1.2.4)	Enhanced awareness of members on Competency Assessment	a) Facilitate assistance from regional resource persons through twinning, etc. b) Conduct RA II Workshop on Competency Assessment of AMP			X	X	Co-coordinators, Theme Leader in Competency Assessment, Regional Training Centers and Volunteer Experts	
AeM-5	EG-AeM (ToR(ii))	Development of guidance material (RKO 1.2.4)	Guidance material on Competency Assessment of AMP for the members of the RA II region	Identify the good practices and cases to demonstrate the implementation schedule and develop a guidance material for use by the members of the region			X	X	Co-coordinators, Theme Leader in Competency Assessment and Volunteer Experts	

AeM-6	EG-AeM (ToR(iii))	Conducting a survey on current status of MET support to ATM (RKO: 1.2.2)	Survey on current status of MET support to ATM in each member	Carry out a survey annually on the status of implementation and planning in each member		X	X	X	Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	Being arranged. To be conducted in close coordination with relevant ICAO offices
AeM-7	EG-AeM (ToR(iii))	Development of a portal web site for information sharing (RKO: 1.2.2)	Portal web-site on MET support to ATM in RA II	a) Develop a portal web-site which can be accessed via internet b) Update relevant information on MET/ATM, including best practices		X			Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	
AeM-8	EG-AeM (ToR(iii))	RAII workshop for MET/ATM improvement (RKO: 1.2.2)	RA II workshop for MET/ATM improvement	a) Hold a workshop on MET support to ATM b) Conjoint work with relevant ICAO and WMO groups, such as ICAO APAC MET/R TF, WMO ET-ISA			X		Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	
AeM-9	EG-AeM (ToR(iii))	Development of RA II guidelines on the establishment of MET support to ATM (RKO: 1.2.2)	RA II guidelines on the establishment of MET support to ATM	a) Develop RAII guidelines with reflecting outcomes of the workshop b) Consider necessary coordination with relevant ICAO and WMO groups, such as ICAO APAC MET/R TF, WMO ET-ISA				X	Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	

AeM-10	EG-AeM (ToR(iii))	Presentation at the TECO in RAII session in 2016 ・	Introduction of regional status and practices of MET support to ATM	a) Introduce examples of best practices of MET support to ATM b) Present regional status and practices of MET support to ATM				X	Theme Leader in MET support to ATM and SIGMET issuance	
AeM-11	EG-AeM (ToR(iii))	Survey on current status and issues on issuance of SIGMET information (RKO: 1.2.1)	Survey on current status of SIGMET issuance in each member	a) Carry out a survey on the status of implementation and planning in each member		X	X	X	Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	Being arranged. To be conducted in close coordination with relevant ICAO offices
AeM-12	EG-AeM (ToR(iii))	Development of a portal web site for information sharing (RKO: 1.2.1)	Portal web-site on SIGMET issuance in RA II	a) Develop a portal web-site which can be accessed via internet b) Update relevant information on SIGMET issuance, including best practices		X			Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	
AeM-13	EG-AeM (ToR(iii))	RA II workshop for SIGMET improvement (RKO: 1.2.1)	RA II workshop for SIGMET improvement	a) Hold a workshop on SIGMET issuance b) Conjoint work with relevant ICAO groups, such as ICAO APAC MET/H TF, ICAO METWSG			X		Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	To contact WMO DRA office for possibility of funding the workshop

AeM-14	EG-AeM (ToR(iii))	Development of RA II guideline for issuance of SIGMET (RKO: 1.2.1)	RA II guidelines on the SIGMET issuance	a) Develop RA II guidelines with reflecting outcomes of the workshop b) Consider necessary coordination with relevant ICAO groups, such as ICAO APAC MET/H TF, ICAO METWSG			X		Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	
AeM-15	EG-AeM (ToR(iii))	Provide input to relevant ICAO groups, e.g. ICAO APAC MET/H TF, ICAO METWSG (RKO: 1.2.1)	Input to ICAO groups for their consideration of ICAO regional/global guidelines on SIGMET issuance	a) Provide input to ICAO groups b) Consider further coordination				X	Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	
AeM-16	EG-AeM (ToR(iii))	Presentation at the TECO in RAII session in 2016	Introduction of regional status and practices of improvement of SIGMET issuance	a) Introduce examples of best practices of improvement of SIGMET issuance b) Present regional status and practices of improvement of SIGMET issuance				X	Theme Leader in MET support to ATM and SIGMET issuance	

Challenges and Priorities of EG-AeM

CHALLENGES:

Noting the efforts demonstrated by some NMHSs in Regional Association II through their twinning/mentoring programmes to further AeM-related implementation process at the regional/subregional level, the Members should be encouraged to work more proactively in light of the recent ICAO/WMO recommendations to develop GANP and ASBU specific plans of actions, sharing the knowledge/practices and tuition to the Members requiring assistance and advice.

PRIORITIES:

Increase the Members' awareness of the new types of AeM related products and services following the newly adopted ICAO/WMO recommendations to upgrade the existing scientific and technological capabilities in the Members, enabling enhanced service delivery within the period up to 2028 and onwards, and urge them for immediate actions to develop and implement modernization programmes in support of GANP and ASBU developments.

Report by the Theme Leader in Emergency Response Activities for 2014

Masami SAKAMOTO, Japan Meteorological Agency

Executive Summary

A concise guidance of the nuclear environmental emergency response (EER) service was developed by the theme leader in emergency response activities (TL-ERA), and was distributed to all members in the Regional Association II (RA II: Asia). A questionnaire survey to ask the non-registered members about their interest in the nuclear EER service was also conducted by TL-ERA and WMO RAP Office. RSMCs (Beijing, Obninsk, and Tokyo) in RA II continued their efforts to maintain contact information for the registered members.

1. Background

This report summarizes the activities in 2014 by the theme leader in emergency response activities (TL-ERA), who is responsible for the emergency response activities (ERA) in the Regional Association II (RA II: Asia) as a member of the Expert Group on Operational Forecasting (EG-OF). The main objectives of the activities by TL-ERA are;

1) monitoring of the provision of products and services by the designated global data-processing and forecasting system (GDPFS) centres within the framework of ERA,

2) advising on evolving requirements for ERA operational systems and services.

2. Distribution of a Concise Guidance on the EER services.

According to the action plan of EG-OF for the 2013 – 2016 period, a concise guidance material on the WMO environmental emergency response (EER) services was prepared by TL-ERA. The material was peer reviewed by the members of the CBS expert team on ERA (ET-ERA) and the relevant experts in RA II (Mr. W. M. Ma of Hong Kong Observatory and Dr. S. Kim of NIMR/KMA). The material was distributed to the international advisers of the members in RA II by the director of RAP office Dr. Park on 7 October. The material covers the following basic issues;

- the basic framework of the EER service
- how to interpret the EER products
- how to request the EER products
- GTS message WNXX01 IAEA (the early warning by IAEA)
- frequently asked questions and answers
- references
- the contact information of the WMO Secretariat

The objective of this activity is to provide better understanding of the EER service. Such understanding is necessary when the national meteorological and hydrological systems (NMHSs) interpret EER products and when NMHSs ask for the EER service.

3. A Questionnaire Survey for the non-Registered Members

A questionnaire survey to ask the non-registered members regarding their interest in the EER service was conducted by TL-ERA and WMO RAP office. Since the EER service is provided only to the registered members, it is very important and essential to understand interest of NMHSs and to suggest them the registration. The questionnaire was distributed by the director of RAP office on 8 October. The objective of this activity is to explore potential interest of the non-registered members and to suggest the registration when necessary.

On 23 September WMO DPFS office distributed a Secretary-General's letter (issued on 19 September) to ask for the registration of the contact information for the EER service. This letter exchange by DPFS office was proposed at the meeting of ET-ERA in Washington October 2013, and was done simultaneously with RA II's questionnaire survey to attain the collaborative effect. Incidentally DPFS office had done a similar letter exchange independently of any regional activities in March 2012, however there was no additional registration in RA II at the time.

As a result of the cooperative efforts this time by RA II and DPFS office, an additional registration from Kuwait was obtained. The permanent representative (PR) of State of Kuwait replied the contact information to WMO Secretariat. The deputy director general of the Maldives meteorological service kindly responded to the questionnaire in RA II and informed that the Maldives meteorological service does not have an immediate interest in the EER service so far.

4. Email / Fax Tests

RSMCs in RA II continue the effort to confirm the email and fax communication for the EER service since 2010. As a result of the efforts by RSMCs Beijing, Obninsk, and Tokyo, the reachability to the registered NMHSs in RA-II is more than 95%, and nearly 80% of the registered members specify their operational contact points appropriately. To maintain such a good result, RSMCs are encouraged to continue their efforts.

The current (as of 26 November 2014) statuses of the members are;

i. Registered and reachable members (28 members)

i.a) with the operational contact point information specified (23 members):

Bahrain, Bangladesh, China, Hong Kong, Islamic Rep. of Iran, Japan, Kazakhstan, Kyrgyzstan, Macau, Mongolia, Myanmar, Oman, Pakistan, Rep. of Korea, Rep. of Uzbekistan, Rep. of Yemen, Russian Federation, Saudi Arabia, Sri Lanka, State of Kuwait, Tajikistan, Thailand, UAE,

i.b) without the operational contact point information specified (5 members):

India, Iraq, State of Qatar, Socialist Rep. of Viet Nam, Turkmenistan,

ii. Registered but not reachable member (one member):

Democratic People's Rep. of Korea,

iii. Non-registered members (6 members):

Afghanistan, Bhutan, Cambodia, Lao, Maldives, Nepal.

5. Other business

The assistant director of the Hong Kong Observatory Mr. K. C. TSUI visited the Japan Meteorological Agency on 16 Oct 2014, and discussed the EER activities in the region with TL-ERA. TL-ERA provides him the latest information of the EER activities including the ERA activities in RA II, the coordination among RSMCs in RA II, and the activities relating to the ET-ERA. Mr. TSUI shared his opinions on the EER activities.

6. Plans for 2015

To understand situation of NMHSs and to monitor of the user requests for the EER service, a user request survey for the registered members will be conducted in 2015 or in 2016. The fax / email tests by RSMCs will continue.

Work Plan of EG-OF (2013-16):

Task #	Reference	Task	Key Deliverable	Activity	2013	2014	2015	2016	Responsible	Status
OF-1	EG-OF (ToR(iv))	Monitoring of the provision of products and services by designated RA II GDPFS Centres within the flamework of the Emergency Response Activities (ERA). (RKO[4]: N/A)	a) Improve the provision measures for the products and services by designated RSMCs for the registered RA II members b) Explore of potential registration of non-registered member states.	Carry out email / fax tests to improve reachability for the registered NMHSs and organizations in RA II.	Done	Done	X	X	RSMCs in RA-II, and Theme Leader in Emergency Response Activities	On going
OF-2	EG-OF (ToR(iv))			Carry out questionaries for non-registerd RA II members.		Done	X		Theme Leader in Emergency Response Activities and WMO Secretariat	
OF-3	EG-OF (ToR(iv))	Advising on evolving requirements for ERA operational systems and servies (RKO[1]: N/A)	a) Provide better understanding of the standard products and the joint statement of ERA. b) Monitor of the user requests for ERA to improve the activity.	Provide registered RA II members and related organizations with a concise guidance for the standard products and the joint statement of ERA.		Done	X		Theme Leader in Emergency Response Activities and WMO Secretariat	
OF-4	EG-OF (ToR(iv))			Carry out user request survey using questionnaires for registered members and potential users			X	X	Theme Leader in Emergency Response Activities and WMO Secretariat	

[1] The co-coordinator of EG-OF advised that there were no pertinent items on the list related to the activities. He was looking forward to have relevant items included under RKO 3.1 of the RA II Strategic Operating Plan in future.

Work Plan of EG-PWS:

Task #	Reference	Task	Key Deliverable	Activity	2013	2014	2015	2016	Responsible	Status
PWS-1	EG-PWS (ToR(iii). (ix))	Identification of Useful Meteorological and Hydrological Products for Public Weather Service Delivery (RKO: 1.2.12, 2.1.10)	Meteorological and hydrological Products	Development of Products (2014). Identify dissemination procedure (2015). Development and maintenance of portal (2016)			X	X	Co-coordinators	
				Case studies of best practices on socio-economics benefits of service delivery by NMHS			X		Theme Leader in Socio-economic Benefits of Meteorological and Hydrological Services	
				A multilayered sustainable system for dissemination of early warnings			X	X	Theme Leader in Delivery of Warning Services	
				Identification of material for vulnerable communities education and awareness (2015), Developing the outlines of material for WMO consideration (2016)			X	X	Theme Leader in Education and Public Outreach related to PWS	

PWS-2	EG-PWS (ToR(iii))	Demonstration of socio-economic benefits (SEB) of weather, climate and water services (RKO: 1.2.12)	Assessment of SEB of weather, climate and water services	Implementation of 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	Co-coordinators, Theme Leader and Volunteer Experts in Socio-economic Benefits of Meteorological and Hydrological Services	
PWS-3	EG-PWS (ToR(vi))	Establish strategy for communication with stakeholders and regional organizations (RKO: 7.2.1)	a) Enhanced visibility of activities and priorities of NMHS; b) Enhanced communication with stakeholders and with regional organizations	Implementation of recommendations at regional level given by the guideline on communication with stakeholders and regional organizations being prepared by WMO CBS/OPAG-PWS ET/COPE			X	X	Co-coordinators, Theme Leader in Delivery of Warning Services and Volunteer Experts under EG-PWS	
PWS-4	EG-PWS (ToR(ix))	Preparation of a guideline for development and implementation of public education programme (RKO: 2.1.10)	Guideline for development and implementation of public education programme	Draft a guideline for development and implementation of public education programme			X	X	Co-coordinators, Theme Leader and Volunteer Experts in Education and Public Outreach related to PWS	
				Finalize and publish the guideline				X	Co-coordinators, Theme Leader and Volunteer Experts in Education and Public Outreach related to PWS	

PWS-5	EG-PWS (ToR(v))	Enhanced capability of public weather services (RKO: 3.1.5)	Enhancement of Members' capability in public weather services	Assistance in the SWFDP Training Workshop on Public Weather Services held in Macao, China in April 2013 for Cambodia, Lao, Thailand, Vietnam, India, Maldives, Myanmar, Sri Lanka, Pakistan, Nepal, and Bhutan	Done				Co-coordinators	
				Assistance in the SWFDP Training Workshop on Public Weather Services held in Manila, Philippines in June 2014 for Cambodia, Laos, Thailand and Vietnam		Done			Co-coordinators	
				Organization of VCP training workshop on "Effective Media Communication" in Hong Kong, China in December 2013 for Bhutan, Cambodia, China, Islamic Republic of Iran, Republic of Kazakhstan, Republic of Korea, Thailand and The United Arab Emirates	Done				Co-coordinators	

				Organization of training workshop/ seminar for RA II Members on the enhancement of public weather service delivery			X	X	All Co-coordinators, Theme Leaders, and Volunteer Experts	
PWS-6	EG-PWS (ToR(ii)&(iii))	Mainstreamed service delivery as contained in "The WMO Strategy for Service Delivery and Its Implementation Plan"	Assessment Reports of service delivery development of Members	Encouraging and assisting Members to complete questionnaire on level of service delivery and/or to prepare the assessment reports of service delivery development; Helping to manage the flow of information and the exchange of knowledge and best practices; Facilitating/developing pilot projects and twinning/mentoring activities of Members			X	X	All Co-coordinators, Theme Leaders, and Volunteer Experts	

Work Plan of RA II-15 Pilot Projects (2013-16)

Task #	Reference	Task	Key Deliverable	Activity	2013	2014	2015	2016	Responsible	Status
PP-1	RAII-PP-NWP (RA II-14 Resolution 6 and RA II-15 Resolution 14)	Invite experts from RA II and beyond to provide face-to-face training and hands-on practicals on NWP modelling and data assimilation	Training workshop for RA II members (under the framework of WMO Voluntary Cooperation Programme) on data assimilation and mesoscale ensemble forecasting	a) Organize RA II training workshop on data assimilation and mesoscale ensemble forecasting b) Promote data and technical exchange between participants		X			KMA HKO	On-going
		Facilitate the sharing of experience and expertise between RA II members on NWP, data assimilation and ensemble prediction system.	a) Survey result on the usefulness of the ACNF website in NWP development and applications b) Enhancement of the web-based portal "Asian Consortium for NWP Forecasts (ACNF)" to include resources and support on post-processing of NWP and ensemble prediction system products as well as data assimilation techniques.	a) Conduct survey to collect users' feedback on the usefulness of the ACNF website in NWP development and applications b) Enhance ACNF web portal based on users' feedback c) Consolidate training materials and source codes from RA II training workshop and put online for subsequent reference and discussions		X	X			a) The Asian Consortium for Numerical Forecasts (ACNF) was established to promote technical exchange between members regarding NWP development. b) A dedicated web-portal has been set up, providing NWP products for RA II countries, technical support on NWP as well as forum for discussion. c) Two community models, GRAPES and NHM, are made available to all members for running through sharing of model codes by CMA and JMA respectively.

PP-2	RAII-PP-AMDAR (RA II-15 Resolution 16) (RKO 7.1.2)	Understand RA II Members' readiness to collect and apply AMDAR data	Survey report on RA II Members' readiness to collect and apply AMDAR data	a) Identify contact points of RA II Members b) Conduct on-line survey		X			CMA CAAC HKO	Analysing results of a survey conducted by ET-ABO. Follow-up enquiries being arranged.
		Invite experts from WMO ET-ABO and other experts to provide face-to-face training on establishment of AMDAR programme and application of AMDAR data	RA II workshop on the establishment of a national AMDAR programme and application of AMDAR data to enhance weather forecasting and warning services	a) Conduct a workshop for RA II Members			X (early 2015)			CAAC, CMA and HKO had initially agreed to conduct RA II workshop(s) in the first half of 2015. Details of the workshop(s) are being confirmed with the coordination of WMO ET-ABO.
		Facilitate the sharing of experience in the collection and application of AMDAR data	On-line discussion forum with active participation of RA II Members and an Internet webpage to showcase the benefit of AMDAR data in weather forecasting and warning service	a) Set up an Internet webpage and a discussion forum b) Consolidate training materials and feedbacks and put them on the discussion forum for subsequent reference c) Invite contact points of RA II Members, members of WMO ET-ABO, and other interested parties to join the forum			X (early 2015)			

PP-3	RAII-PP-MWF (RA II-15 Resolution 17)	a) Identifying reliable sources of NWP products and means of post-processing to support NMHSs in provision of medium range forecasts. b) Understand current capacity and limitations in RA II Members in provision of medium range forecasts using NWP model products;	Survey report on RA II Members' status on using NWP model products, post-processing techniques and provision of medium range weather forecasts.	a) Identify contact points of RA II Members b) Conduct survey (on-line or submission of survey form through email)		X	X (Early 2015)		HKO KMA	a) Available sources of NWP products have been identified such as global NWP model outputs from KMA to support NMHS in providing medium range weather forecasts. b) A survey will be conducted to collect Members' feedbacks on current status, limitations, post-processing techniques required in provision of medium range forecasts using NWP model products. c) A resource inventory on the methods on verification and validation of NWP-based weather forecasts to be formulated to assist the Members in using the model or its post-processed products for medium range weather forecasts.
		a) Assist NMHSs in applying NWP products and post-processing methods to generate medium range forecast, in compliance with the needs of NMHSs to be supported; b) Identify methods and assist NMHSs in verification and validation of NWP-based weather forecasts;	Web page with resources on NWP products and post-processing tools for access by RA II Members	a) Set up web page / online resources b) Engage contact points of RA II Member to actively participate in the development and exchange of knowledge through online forum / knowledge-based portal. c) Explore means to disseminate model-based official weather forecasts via WWIS website			X (to mid 2016)			

		To promote sharing of experience in NWP product application, post-processing techniques among Members of RA II especially developing country Members;	Where possible, training workshop on use of NWP products and post-processing techniques in provision of medium range weather forecasts. Establishment of project website for sharing of experience.	a) Where possible, conduct training workshop for RA II Members b) Arrange trial dissemination of NWP-based official weather forecasts in the medium range on WWIS. c) Consolidate training materials and feedbacks on project website for RAII Members' reference and for promoting on-going development in RA II Members				X (late 2016)		
PP-4	RAII-PP-WARNING (RA II-15 Resolution 18)	Understand current situation and identify issues on data format for tropical cyclone warnings/advisories among RA II Members	Survey report on data format of tropical cyclone warnings/advisories currently in use by RA II Members	a) Identify contact points of RA II Members b) Conduct on-line surveys c) Analyze results		X	X		HKO	Survey form is under preparation for collecting data format of tropical cyclone warning/advisories in use by RAII members

		Identify a possible solution to arrive at a common data format for tropical cyclone warnings/advisories for RA II Members	Report on feasibility of converting RA II Members' tropical cyclone warnings/advisories into common data format	a) Identify a suitable common data format for use in tropical cyclone warnings/advisories b) Propose technical solution in converting RA II Members' tropical cyclone warnings/advisories into the common data format				X		

Working Group on Climate Services (WGCS)

Akihiko Shimpo
Tokyo Climate Center, Japan Meteorological Agency

1. Introduction

The WMO RA II Working Group on Climate Services (WGCS) was established considering that the Regional Association II (RA II) should continue to play an important and active role in the implementation of WMO regional activities in the field of climate services including agrometeorological services, with particular attention to matters relevant to implementation of the Global Framework for Climate Services in the Region. WGCS will work on climate and agrometeorological issues laid out in the terms of references in close cooperation with WMO's Technical Commissions, in particular, Commissions for Climatology and Agrometeorology.

2. Working Group Structure

The Working Group is composed of Expert Groups for Climate Services (EG-CS) and Expert Group for Agrometeorology (EG-AgM). Both EG-CS and EG-AgM consist of two co-coordinators and five theme leaders. In addition, a number of volunteer experts who are expected to assist the tasks of each Expert Team have also been registered.

3. Terms of Reference

(a) To provide assistance and advice to the president of Regional Association II on all matters pertaining to the regional aspects of the relevant components of the World Climate Programme and the Agricultural Meteorology Programme and, in particular, to assist and advise the president of RA II on matters relevant to implementation of the Global Framework for Climate Services in the Region;
(b) To cooperate with the Commission for Climatology and the Commission for Agricultural Meteorology and other WMO bodies on activities related to climate services;
(c) To undertake and to coordinate activities relating to climate services as listed in the EG-CS and EG-AgM, respectively;
(d) To report, through the chair of the WGCS, to the president of RA II on an annual basis on activities relative to the above terms of reference.

4. Membership of Working Group

Expert Group on Climate Services (EG-CS)

EG-CS	Name	Country
Co-Coordinators	Mr Akihiko Shimpo	Japan
	Dr Ghulam Rasul	Pakistan
Theme Leader on User Liaison and Applications of Climate Information and Products for Climate Risk Management and Adaptation to Climate Change	Dr Ali Karem Kadhum	Iraq
Theme Leader on QMS Implementation and Operation of Regional Climate Centres	Mr Peiqun Zhang	China
Theme Leader on Operational Regional and National Climate Outlook Forums	Dr A. K. Srivastava	India
Theme Leader in Climate Monitoring and Climate Watch	Ms Yuliya Plotnitskaya	Uzbekistan
Theme Leader in Climate Research for Development	Ms Yuping Yan	China

Expert Group on Agrometeorology (EG-AgM)

EG-AgM	Name	Country
Co-Coordinators	Dr N. Chattopadhyay	India
	Dr AlexanderKleshchenko	Russian Federation
Theme Leader on Agrometeorological Training Needs	Ms Feruza Rakhmanova	Uzbekistan
Theme Leader on Soil Moisture Monitoring	Ms Xuefen Zhang	China
Theme Leader on Drought Preparedness and Management Strategies	Mr Mir Hazrat	Pakistan
Theme Leader in Socio-economic Impact of Agrometeorological Information	Mr Kamalesh Kumar Singh	India

5. Development of Work Plan

A work plan for the WGCS was developed by co-coordinators of Expert Group on Climate Services and Expert Group on Agrometeorology, with the help of theme leaders and the WMO secretariat. The work plan for the WGCS was submitted to the WMO Secretariat in December 2013.

The work plan was developed mainly based on the deliverables outlined in the RA II Strategic Operating Plan, terms of reference of the Expert Groups. The plan consists of: (1) Tasks; (2) Key deliverables; (3) Activities; (4) Timelines and (5) Responsible Theme Leaders/Co-coordinators.

Nine tasks for EG-CS and five tasks for EG-AgM were established in the work plan and each task includes several relevant activities. Theme leaders of EG-CS and EG-AgM are expected to take a role in the said activities with the support of, and coordination with, co-coordinators.

6. Expert Group on Climate Services

6.1 Implementation and Development of RCCs

The Beijing Climate Center (BCC) of the China Meteorological Administration (CMA) and the Tokyo Climate Center (TCC) of the Japan Meteorological Agency (JMA) formally designated as WMO Regional Climate Centers (RCCs) in RA II in 2009, have conducted a variety of RCC-related activities, including the dissemination of climate data/products and the organization of training workshops for capacity development in accordance with RCC mandatory functions.

In addition, the North Eurasia Climate Centre (NEACC) coordinated by ROSHYDROMET, Russian Federation was also formally designated as a new RCC at EC-65 in June 2013. In response, BCC and TCC have introduced a new design on the website (http://www.rccra2.org/) to add links to climate products provided by NEACC.

India began a demonstration phase as a candidate RCC in May 2013. Iran and Saudi Arabia have expressed interest in hosting WMO RCCs.

Some newly developed climate products have been made available on their website.

- Forecast of climate indices (EA, WA, EU, WP, NAO, AOS) in monthly and seasonal timescale in Russian (RCC Moscow)
- Monthly Discussion on Seasonal Climate Outlooks (RCC Tokyo)

This comprehensive material consists of Latest State of the Climate System, Three-month Predictions, Warm/Cold Season Predictions (issued in February/September). It is intended to assist Asia-Pacific NMHSs in interpreting and assessing the products of GPC Tokyo for three-month predictions and warm/cold season forecasting and to help NMHSs understand the current conditions of the climate system)

- Forecast Products in Support of Early Warnings for Extreme Weather Events (RCC Tokyo)
- *The products include maps of the Extreme Forecast Index (EFI), extreme weather warnings based on the EFI and probabilistic forecasts for extreme conditions together with the EPSgram covering the period up to two weeks ahead.*

6.2 Progress in the implementation of RCOFs

In RA II, Regional Climate Outlook Forums (RCOFs) are convened regularly. These include the Forum on Regional Climate Monitoring, Assessment and Prediction for Regional Association II (FOCRA II) coordinated by China since 2005, the South Asian Climate Outlook Forum (SASCOF) coordinated by India since 2010, the North Eurasian Climate Outlook Forum (NEACOF) coordinated by NEACC since 2011.
In addition, new RCOFs, namely, the East Asia winter Climate Outlook Forum (EASCOF) and ASEAN Climate Outlook Forum (ASEANCOF; including some RA V Members) started in 2013.

In 2014, the following RCOF sessions were held.

Dates	Name	Venue	Participants
22-23 April	SASCOF-5	Pune, India	Experts of NHMSs from 8 South Asian countries and international experts
23-25 April	FOCRAII (10^{th} session)	Beijing, China	More than 80 experts from 19 WMO Members including 12 RA II Members (China, DPRK, Hong Kong, Japan, Korea, Macao, Laos, Maldives, Mongolia, Pakistan, Russia, Thailand, Yemen)
End of May	NEACOF-6	(Internet)	Experts of NHMSs from CIS countries
29 May	ASEANCOF-2	(Video conf.)	Experts of NHMS from ASEAN countries and international experts
29-31 October	EASCOF-2	Tokyo, Japan	More than 30 experts from China, Japan, Republic of Korea and Mongolia
17-19 November	ASEANCOF-3	Singapore	Experts of NHMS from ASEAN countries and international experts

6.3 User interface for climate services

There is a recognized need to encourage the exchange of good practices and the sharing of experiences in the application of climate information among NMHSs and to strengthen user-provider interaction. Some RCOFs including FOCRAII and SASCOF have provided such opportunities by inviting experts from user sectors, such as agriculture and health, to the meeting and by listening to their needs for climate information.

6.4 Pilot Project on Information Sharing on Climate Services

For the successful implementation of GFCS, it is important to share good practices and lessons learned, including experienced project management capabilities, to develop projects and improve climate services by NMHSs as well as to avoid duplication and minimize the risk of failure. The WMO RA II's fifteenth session decided to establish a pilot project on information sharing on climate services. The project aims at sharing information on climate services and best practices of climate information among NMHSs in the region for the successful implementation of GFCS. TCC has been designated as
Lead for the project to establish and maintain a dedicated website.

TCC collected climate information provided by NMHSs as well as details of good practices on the application of climate information in society via a questionnaire survey. Based on the information received, TCC developed the dedicated website (http://ds.data.jma.go.jp/tcc/pilot/).

6.5 Capacity development activities for climate services

A number of capacity development activities, such as training events and expert visits have been conducted in the region organized by WMO Regional Training Centres, RCCs (BCC, NEACC and TCC) and some NMHSs. Such events have also been held in conjunction with RCOFs including FOCRAII, SASCOF and NEACOF.
Many of these events have been conducted on a practical basis so that trainees could apply what they learnt to their operational climate services soon after returning to home countries. Some examples of capacity-development activities (training events) conducted in 2014 are shown below.

Events/Activities	Dates	Venue	Organizer	Participants
Capacity Building Training Workshop on Seasonal Prediction (followed by SASCOF-5)	14-21 April	Pune, India	IMD	Experts of NHMSs from 8 South Asian countries (Afghanistan, Bangladesh, Bhutan, Maldives, Myanmar, Nepal, India and Sri Lanka) and international experts
International Training Course on Short-term Climate Prediction Methods (followed by FOCRAII)	14-25 April	Beijing, China	RTC Beijing	18 experts of 14 NMHSs including those from 9 Members in RA II (DPRK, Hong Kong, Laos, Maldives, Mongolia, Pakistan, Russia, Thailand and Yemen)
Training for Central Asian NMHS specialists in area of Long-range forecasting	26-30 May	Almaty, Kazakhstan	NEACC	9 experts from NHMS of Central Asia countries
Expert visit on the generation of guidance for seasonal forecasts using the statistical downscaling technique	24-26 June	Nay Pyi Taw, Myanmar	TCC	15 experts of the Department of Meteorology and Hydrology
Eleventh International Seminar on Climate System and Climate Change	14-25 July	Beijing, China	BCC	More than 100 experts from 14 WMO Members including 5 RA II Members (Kazakhstan, Pakistan, Myanmar, Mongolia, Hong Kong)
International Training Course on Climate Monitoring, Prediction and Application	20-31 Oct.	Beijing, China	RTC Beijing	16 experts of 10 WMO Members including 6 RA II Members (Republic of Korea, Hong Kong, Myanmar, DPRK, Oman, Pakistan)
Training Seminar for NMHS specialists from Tajikistan	5-7 Nov.	Moscow, Russia	NEACC	Two experts from NHMS of Tajikistan

7. Expert Group on Agrometeorology

7.1 Training in Operational Agrometeorology under GFCS:

Agricultural Meteorology Division, India Meteorological Department (IMD), Ministry of Earth Sciences, Government of India in collaboration with the World Meteorological Organization (WMO)organized two weeks training programme from 28January to 9February 2013 on "Operational Agrometeorology for serving end users requirement" for capacity building in the agriculture sector of the Global Framework for Climate Services (GFCS) at Pune, Maharashtra, India. The training was specially designed for the professionals in East African (Burundi, Ethiopia, Kenya, Rwanda, Tanzania, Asian participants (Bangladesh, Maldives, Myanmar, Sri Lanka, and Thailand).Ideally, the training was for scientists working in operational Agrometeorological Advisory Services and those who are providing climate/ weather information products and services, preferably professional staff of National Meteorological and Agrometeorological Services and also range of professionals working on farm management and design issues where weather and climate data is relevant.

7.2 Climate services for farmers:

The joint workshop on Climate Services for farmers held on 14thApril 2013 at the Toki Messe Niigata Convention Center in Niigata, Japan. From this workshop, the participants learnt a lot about various experiences of farmers from various continents on climate changes including challenges for small farmers, mitigation measure, adaptation measure and the roles of stakeholders (farmers, farmers' organizations, development agencies, researchers/scientists, the Governments and mass media).

7.3 Capacity Building for Agrometeorological Services:

India Meteorological Department (IMD), Ministry of Earth Sciences, India & World Meteorological Organization WMO), Geneva, Switzerland jointly organized International Workshop on "Capacity Building for Agrometeorological Services" during 28-29 October 2013. The objectives of the workshop were the improvement of capacity building aspects of agrometeorology, review of communication of advisories to the farmers, training needs on Operational Agrometeorology, automation of agromet services and use of satellite & GIS in agrometeorology. This was followed by the meeting during 30-31 October 2013 on finalization of CAgM OPAG 1 Implementation/Coordination Team on Agrometeorological Services for Agricultural Production.

7.4 Review and Future work of CAgM Management Group:

CAgM Management Group meeting was organized in November 2013 in the Republic of Korea. The Commission expressed its satisfaction that the CAgM Management Group had completed all its assigned tasks based upon the terms of reference for its re-establishment. The Commission appreciated the efforts of Management Group where it discussed the future work of the Commission and decided to move the Commission to an Open Panel structure with four Focus Areas.

7.5 Initiative on Global Alliance of Phenology Observation Network (GAPON):

The first GAPON Steering Committee meeting was held in November 2013 in Jeju, Republic of Korea. The Commission noted the work of the president in developing GAPON concepts with the Joint Expert Group on Climate, Food and Water and the International Society of

Biometeorology (ISB). This is followed by the 2nd International Symposium on Climate, Food and Water, which was held 3-9 November 2013 in Jeju, Republic of Korea.

7.6 National Drought Management Policies for Asia-Pacific:

After successful completion of the 1st and 2nd Regional Workshops for Eastern Europe and Latin America and the Caribbean regions respectively, 3rd Regional Workshop on "National Drought Management Policies for Asia-Pacific" was held from 6-9 May, 2014 in Hanoi, Viet Nam. The Viet Nam Academy of Water Resources (VAWR) and FAO Viet Nam Office hosted the event and served as local partners. The workshop was attended by more than 30 participants from 10 countries in the Asia-Pacific region: Cambodia, China, India, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Thailand and Viet Nam. The full content of the workshop can be found below.

7.7. Farmer Awareness Programme:

Agricultural Meteorology Division, India Meteorological Department (IMD), Ministry of Earth Sciences, Government of India in collaboration with State Agricultural University, Institutes of Indian Council of Agricultural Research and Indian Institute of Technology organized number of Farmer Awareness Programmes involving all the concerned stake holders. The objective of these programmes was to make farmers become more self-reliant in dealing with weather and climate issues that affect agricultural production on their farms.

Working Group on Hydrological Services (WGHS)

Sung Kim
Korea Institute of Civil Engineering and Building Technology

1. Introduction

At the fifteenth session of the RA II in December 2012, the establishment of the WMO RA II Working Group on Hydrological Services (WGHS) was decided.

2. Working Structure

The working group is composed of one Chairperson, one Vice-chairperson and eight theme leaders.

3. Terms of Reference

The terms of reference of the Working Group on Hydrological Services (WGHS) are as follows:

(a) To provide assistance and advice to the president of the Association on all questions pertaining to the regional aspects of the Hydrology and Water Resources Programme;

(b) To engage in and monitor the implementation of water-related activities documented in the RA II Strategic Operating Plan;

(c) To undertake activities relating to the Hydrology and Water Resources Programme as listed below;
- Strengthening the capability of Members to assess their water resources: water resources assessment, its variability and use (surface water including reservoirs and groundwater);
- Improve accuracy and timeliness of forecasting floods of different cause and origin through enhanced cooperation between National Meteorological Services and National Hydrological Services, within the context of the WMO Flood Forecasting Initiative;
- Hydrological aspects of drought, including drought monitoring, and assessment of water scarcity and deficits;
- Hydrological responses to climate variability and change and promotion of the use of climate information by water managers;
- Improved accuracy of hydrometric and sediment observations including space-based technologies;
- Sediment disasters and mass movements (flood and rainfall induced);

(d) To cooperate with the Commission for Hydrology and other WMO bodies on activities and projects related to hydrology and water resources;

(e) To seek cooperation with other regional bodies and organizations on issues related to the Hydrology and Water Resources Programme;

(f) To actively contribute to the Global Framework for Climate Services through dedicated components in the identified theme areas of work during the next intersessional period 2013–2016;

(g) To undertake activities related to the transfer of technology through the Hydrological Operational Multipurpose System and capacity-building in a cross-cutting manner;

4. Membership

Chairperson WGHS	Dr Sung Kim	Republic of Korea
Vice-chairperson WGHS	Mr Muhammad Riaz	Pakistan
Theme Leader in Water Resources Assessment	Ms Ge Gao	China
	Ms Hwirin Kim	Republic of Korea
Theme Leader in Flood Forecasting	Dr Sergey Borshch	Russian Federation
Theme Leader in Hydrological Aspects of Drought	Ms Irina Dergacheva	Uzbekistan
Theme Leader in Hydrological Responses to Climate Variability and Change and Promotion of the Use of Climate Information by Water Managers	Mr Guoqing Wang	China
	Dr Thuc Tran	Viet Nam
Theme Leader in Improved Accuracy of Hydrometric and Sediment Observations including Space-based Technologies	Mr Youngsin Roh	Republic of Korea
Theme Leader in Sediment Disasters and Mass Movements	Dr Tai-Hoon Kim	Republic of Korea

5. Working Group meeting

A session of the Working Group on Hydrological Services (WGHS) of the WMO Regional Association II (Asia) was held in Seoul, Republic of Korea, from 30 September to 2 October 2014 with the following agenda.

1. Opening of the Meeting
2. Adoption of the agenda and organization of work
3. Review of activities since previous WG session (including meetings of CHy, Presidents of Technical Commissions and Presidents of Regional Associations)
4. Modes of operation of the WGHS (including Task Teams)
5. Consideration of decisions of RA-II-15, CHy-14, Cg-16 and relevant ECs
6. Work programme

6.1 Chairperson
6.2 Vice-Chairperson
6.3 Water Resources Assessment
6.4 Flood Forecasting
6.5 Hydrological Aspects of Drought
6.6 Hydrological Responses to Climate Variability and Change and Promotion of
6.7 Improved Accuracy of Hydrometric and Sediment Observations including
6.8 Sediment Disasters and Mass Movements

7. Field trip
8. Cooperation with other international organizations
9. Other business
10. Adoption of the report and closure of the session

The final report of the meeting is available at http://www.wmo.int/pages/prog/hwrp/RA2/documents/RA-II_WGH_2014_FINAL_REPORT.pdf.

The second session of the Working Group on Hydrological Services (WGHS) of the WMO Regional Association II (Asia) was held in Gyeongju, Republic of Korea, from 14 to 16 April 2015.

The draft final report of the meeting is attached to this document.

WORLD METEOROLOGICAL ORGANIZATION

WORKING GROUP ON HYDROLOGICAL SERVICES

REGIONAL ASSOCIATION II (ASIA)

Report of the Second Session of WGHS – RA II (Asia)

Gyeongju, Republic of Korea

14 to 16 April 2015

DRAFT FINAL REPORT

May 2015

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1. OPENING OF THE MEETING

1.1 At the kind invitation of the Government of the Republic of Korea, the second session of the Working Group on Hydrological Services (WGHS) of the WMO Regional Association II (Asia) was held in Gyeongju, Republic of Korea, from 14 to 16 April 2015.

1.2 The session was opened at 09:00 a.m. on Tuesday 14 April 2014 at the Mars Hall, Main Building of the Daemyung Resort in Gyeongju and Room 201 Gyeongju Hyundai Hotel in Gyeongju, Republic of Korea.

1.3 In his welcome remarks, Mr Sung Kim, Senior Research Fellow, Korea Institute of Civil Engineering and Building Technology (KICT), highlighted the importance of this second session the WGHS, as it permitted reporting on progress and fine-tuning work plans. He also noted that work activities needed to be completed by 2016 prior to the next meeting of RA II. He recalled that there was a requirement to provide a final report for the WGHS associated with the RA II meeting, and he wished to discuss later in the meeting the possibility of holding a third session of the WGHS to assist in its preparation. He also noted that this session of the WGHS also was strongly linked with the on-going meetings of the 7th World Water Forum (WWF7), with the WGHS contributing to the Regional Session entitled “Hydrological Services in Asia under Rapidly Changing Conditions”. He also noted that this also provided an opportunity for the WGHS to attend some of the forum’s sessions.

1.4 The representative of WMO, Mr Paul Pilon, thanked Mr Kim for hosting the meeting of the Working Group, and welcomed everyone to the second session on behalf of the Secretary-General WMO, Mr Michel Jarraud. He reiterated the importance of the work of the Regional Association and, in particular, the work of the WGHS. He concurred with Mr Kim that this meeting afforded an excellent opportunity to check on progress and to adjust the work plans, as well as to provide participants of the WWF7 with insights on the activities of the WGHS and the importance and relevance of these efforts for others in the region as well as throughout the world.

1.5 Mr Zhiyu Liu, Vice-president CHy, also thanked the Government of the Republic of Korea for its generosity in hosting the meeting. He welcomed the participants to the meeting and indicated that he was attending as an observer, with the goal of forging stronger links between CHy and the RA II WGHS. Mr Liu indicated that throughout the meeting he would introduce activities of CHy, and he would also bring to attention activities that might be missing. He indicated that he looked forward to learning of the progress of the WGHS and what could be achieved over the next eighteen or so months.

2. ADOPTION OF THE AGENDA AND ORGANIZATION OF WORK

2.1 The session was attended by 13 participants from three countries of the RA II. Mr Zhiyu Liu attended the meeting in his capacity as Vice-president of the WMO Commission for Hydrology (CHy).

2.2 The list of participants is given in Annex 1 to this report. Mr P. Pilon acted as Secretary for the meeting and Mr Sung Kim chaired the sessions of the WGHS.

2.3 The WGHS discussed the agenda and adopted it (Annex 2). Mr Kim briefly mentioned that he had reported to the RA II Management Group on the activities of the WGHS, including its intended participation in WWF7. Participants also agreed on the working hours, noting that should time permit, participants would attend sessions of the WWF7. It was also noted that all presentations made and material provided during the meeting can be downloaded from the following URL:

www.wmo.int//pages/prog/hwrp/RA2/RAII-WGH-seoul.php

The site also includes all presentations made by WGHS at the WWF7 Regional Session entitled “Hydrological Services in Asia under Rapidly Changing Conditions”, as well as the session outcomes presented to the Asia-Pacific Regional Synthesis and Commitment Session WWF7.

2.4 After an initial discussion, participants agreed that the main deliverables of this meeting were:

i. Adjusted individual work plans including statements on progress made to date;

ii. Discussion and agreement on individual presentations to be delivered during the Regional Session; and

iii. Discussion and agreement on main outcome messages to be delivered to the Asia-Pacific Regional Synthesis and Commitment Session.

3. REVIEW AND ADJUSTMENT OF WORK PROGRAMME

3.1 The work plans of all members present were reviewed and adjusted as required during the meeting. The revised work plans appear herein. The work plans of those members who were absent, namely Messrs Muhammad Riaz and Tran Thuc, and Ms Irina Dergacheva, were revised by Mr Sung Kim through correspondence with said members following the conclusion of the meeting. All revisions to their work plans are also contained herein.

WORKPLAN: Chairperson of WGHS **Sung KIM**

Actions	Activities	Outputs	Resources	Milestones	Linkages	Progress
• Represent WGHS as and when required, (e.g. at MG and EC) • Attend meetings of chairpersons of Working Groups • Other duties as required of chairpersons WGHS (see General Regulation 168 (b))	1. In his capacity as Hydrological Adviser, to assist the president of RA II in accordance with the duties stipulated in Regulation 168 (b) of the WMO General Regulations	• Hydrology and Water Resources issues remain a key aspect of the work of RAII • NMHSs are assisted in fulfilling their roles and responsibilities • WGHS is adequately represented within the RAII environment	• Resources are provided to meet the needs of the theme leaders in doing the work of the Working Group • Secretariat support	• Meetings and other activities according to the WMO Schedule of Meetings • Report at WGHS meetings • Report at MG Sessions • Report to RAII-16 (2016)	• WGHS • RAII • MG • EC	• On-going
• Chair theme leaders meetings of the WGHS to develop implementation plan • Report to MG meeting for consultation • Submit report	2. To develop a Working Group implementation plan in consultation with the president and the Management Group of the Association, with reference to the key performance indicators/ targets and action plans under the respective expected results of the RA II Strategic Operating Plan, to undertake work on the various theme areas under the charge of the Working Group	• WGHS implementation plan	• Resources are provided to meet the needs of the theme leaders in doing the work of the WGHS	• WGHS meeting (Sept. 2014) • WGHS implementation plan (Oct 2014) • Report at MG Sessions for consultation and submit a report to RA II president (2014)	• WGHS • RA II • MG	• Attended RA II Management Group meeting in Doho - Dec 2014
• Attend EC meeting if required • Develop WGHS work plan in consideration of CHy and other regional WGHS activities	3. To participate in Executive Council sessions, when invited, representing the regional interests in relation to hydrology and water resources and to coordinate the WGHS activities with the	• Meeting report • WGHS implementation plan	• Resources are provided to meet the needs of the theme leaders in doing the work of the WGHS	• WGHS meeting (Sept 2014) • WGHS implementation plan (Oct 2014) • Report at MG	• WGHS • RAII • MG	• Oct 14 Meeting Report of WGHS and implementation plan • Reported to RA II

Actions	Activities	Outputs	Resources	Milestones	Linkages	Progress
• Organize WGHS meeting	Commission for Hydrology and other regional Working Groups on Hydrology			Sessions for consultation and submit a report to RA II president (2014)		MG Dec 2014 and submitted report
• Develop WGHS activity report with input from theme leaders	4. To submit to the President of the Association every year an Annual Report by 31 Dec and a final report in time for presentation to the 16th Session of the Association, both copied to the WMO Secretariat, with inputs from theme leaders under the Working Group	• WGHS activity report	• Resources are provided to meet the needs of the WGHS theme leaders	• Submit annual report to RA II President and WMO Secretariat (Dec 2014 and 2015) • Submit final report to RAII president and WMO Secretariat (2016)	• WGHS • RAII • WMO	• Dec 2014 report submitted

WORKPLAN: Vice Chairperson of WGHS (RA II) **Muhammad RIAZ**

Activities	Actions	Outputs	Resources	Milestones	Linkages	Progress
1. To assist the chairperson WGHS in accomplishing his work related to the group activities	• As delegated by the chairperson	• Not specified	• As appropriate	• As appropriate	• Chairperson	• On-going
2. To review the reports sent by various Theme leaders through the Chairperson	• Summary of review	• Report	• Chairperson • Theme Leaders • RA II Secretariat • CHy	• Not specified	• Chairperson • Theme Leaders • RA II Secretariat • CHy	• On-going
3. To review and develop the Hydrological Parts of S.O.P.	• Review if required	• Review report	• RA II Strategic Operation Plan • RA II MG	• Not specified	• Chairperson	
4. To put up suggestions and collaboration in strengthening of Flood Forecasting & Warning System amongst Member States	• Review related reports	• Suggestions	• Theme Leaders reports in RA II • CHy report	• Submission of report by 2016	• RA II • WGHS • CHy	
5. To assist the Chairperson on matters related in combating marine pollution	• Review S.O.P. and some suggestions	• Suggestions	• S.O.P	• Suggestions by the end of 2014	• S.O.P • WGHS	

WORKPLAN: Water Resource Assessment **GAO Ge and Hwirin KIM**

Activities	Actions	Outputs	Resources	Milestones	Linkages	Progress
1. Assessment of basin-wide water resources availability, including use of climate predictions (3.3.2)	• Prepare assessment and outlook of basin-wide availability water surplus and deficits on a national level in a regional context including the use of climate scenarios. (Priority C)		• RA II		• RA II • CHy	
2. Assessment of basin-wide water resources availability, including use of climate predictions (3.3.2)	• Set up knowledge base to adapt to changes in water resources availability (trends, outlook) (Priority A)	• Report related to the case studies	• RA II • Research documents	• Develop new system by Dec 2015 • Collection case studies by July 2016 • Evaluate model performance by Sept 2016 • Final report on new model in Nov 2016	• RA II • AWG	• Case studies being collected • Use made of KICT CAT (Catchment Hydrologic Cycle Assessment Tool)
3. Implementation of Water Resources Assessment (WRA) (3.3.3)	• Provide guidance materials for WRA linking to Climate extended range prediction - Downscaling - monthly and seasonally prediction WRA models - WRA (Priority B)	• Guidance for WRA	• China • Korea	• Provide draft technical report in Nov 2016	• RAII • CHy	
4. Development of national and regional capacity building programmes and related training activities for hydrological services (3.3.4)	• Provide training material for a training course related to the advances in WRA: - Downscaling methods for extended range prediction - Data collection - WRA methods - WRA Information system (Priority B or C)	• Training Course	• WMO Regional Training Center in Nanjing	• Training Course in Jun 2016		

WORKPLAN: Flood Forecasting **Sergey BORSHCH**

Activities	Actions	Outputs	Resources	Milestones	Linkages	Progress
1. Improvement in hydrological warnings capability through enhanced and effective cooperation with other NMHSs (2.1.1)	• To prepare recommendations on the use of numerical weather prediction outputs in flood forecasts (Priority A) • Document approaches to ascertain the deterministic error of each ensemble element of a NWP output, for example over the previous thirty day period, using this deterministic signal to provide a weighting on the confidence of the forecasted ensemble elements (Priority A) • Use WMO FFI as platform [for a and b above] (Priority A) • Organize training course for Members (Priority C)	• Recommendations on the use of NWP outputs in flood forecasting systems • Document on the approaches to establishing the deterministic error in NWP outputs and for their use in establishing enhanced accuracy of hydrological forecasts	• HMC of Russia	• Gathering of background material and documents on the FFI and associated activities - January 2015 • Preparation of Draft Recommendations – Oct 2015 • Gathering of materials - September 2015 • Develop system for 3 rivers • Operational testing of system June-Sept 2015 • Preparation of Draft Report on procedures – February 2016	• OPACHE's • International Flood Initiative – WMO	• Background material and documents on the FFI and associated activities were gathered. Preparation of 1st draft of Recommen-dations on the use of numerical weather prediction outputs in flood forecasting is in progress. The 1st part of the Draft Recommendations for the long-term hydrological forecasting has been prepared. • Gathering of materials on the approaches to establishing the deterministic error in NWP outputs with the purpose for their use in establishing enhanced accuracy of hydrological forecasts is in

Activities	Actions	Outputs	Resources	Milestones	Linkages	Progress
						progress.
2. Issuance of flood, flash and urban warnings and constantly improving upon them (2.2.5)	• To document experiences in the use of the Flash Flood Guidance System (FFGS) in various countries by reviewing use of the Flash Flood Guidance System (FFGS) in the various countries (Priority A) • To investigate the potential use of FFGS in Central Asian countries and facilitate its understanding by operational hydrologists in the region (Priority A) • To develop recommendations on use of hydrological forecasts (including probabilistic forecasts) in flood management (Priority A) • Develop user-oriented flood forecasting products (Priority C) • Conduct missions to Members in developing countries or least developed countries (Priority C)	• Report documenting experiences, including recommenda-tions on approaching implementation of FFGS and its use • Recommended path forward for advancing the adoption of the FFGS in Central Asia. • Conduct kick-off meeting of senior meteorologists and hydrologists within Central Asia on the FFGS project • Report containing recommenda-tions on use of hydrological forecasts (including probabilistic forecasts) in flood management, based on experiences of Roshydromet	• Working meeting with hydrologists and meteorologists of the Central Asia countries on use the FFGS in operative hydrological practice • Funding for kick-off meeting for Central Asia FFGS	• Background material and documents on the FFGS and associated activities - May 2015 • Preparation of Draft Document – July 2015 • Discussions with potential collaborating NMHSs in Central Asia - May 2015 • Preparation of Draft Recommendations – July 2015 • Conduct kick-off meeting - May 2015 • Report prepared by March 2016		
3. Improvement in capacity for water-related disaster management (hydrological extremes) [with theme on hydrological droughts] (2.1.3)	• Organize a workshop [or two workshops] on the provision of input and support to disaster management [on community-based flood and drought management including	• Increased capacity for water-related disaster management	• Resources to conduct necessary workshops through collaboration	• Training session on Integrated Flood Management dealing with development of community capacity	• APFM • IDMP • NMHSs • WMO	• The development of the plan to organize bilateral Russia-China

Activities	Actions	Outputs	Resources	Milestones	Linkages	Progress
	participation of NMHSs, emergency services and disaster management groups] (Priority B)		with APFM and IDMP	- Sept 2016 • Training session on Integrated Drought Management dealing with development of community capacity – November 2016		training sessions is in progress (to take place in Moscow in April 2016)

Activities	Actions	Outputs	Resources	Milestones	Linkages	Progress
1. Monitoring and Warning Systems for Droughts (2.3.1.)	(a) Develop indicators for the determination of the onset of hydrological droughts: - Collection, analysis and systematization of data to identify indicators for the determination of the onset of hydrological droughts - Identify the types of Hydrological drought is characteristic of the Asian region - Study of the conditions of formation of hydrological drought (Priority A)	• Report on the Indicators for the determination of the onset of hydrological droughts	• WGHS RA II • OPACHE Uzbekistan experts • Materials for IDMP • Materials for HMNDP	• Preparing of the data and information to develop indicators for the determination of the onset of hydrological droughts - Oct 2015 • Draft Report – Dec 2015	• OPACHE's • WGHS • RAII • WMO	
	(b) Prepare guidance for the development of drought monitoring networks : - Gathering information about the status of drought monitoring networks in Asian region - Identification of gaps and needs of the national hydrometeorological services to improve the drought monitoring networks (Priority B)	• Guidance materials for the development of drought monitoring networks	• WGHS RAII • OPACHE Uzbekistan experts • Materials for IDMP • Materials for HMNDP	• Information for the development of drought monitoring networks – April 2016 • Draft Report - May 2016	• OPACHE's • WGHS • RAII • WMO	
2. Enhanced preparedness to predict and manage hydrological droughts and knowledge for decision making (3.4.1.)	(a) Document national guidance materials to manage droughts: - survey on current status - analysis - identify good practice (Priority C)	• Guidance materials to manage droughts	• WGHS RAII • OPACHE Uzbekistan experts • Materials for IDMP • Materials for HMNDP	• Draft Report - July 2016 • Report - Sept 2016	• OPACHE's • WGHS • RAII • WMO	

WORKPLAN: Assessment of Changes in Climate Extremes, their Impacts on Water Resources, and Translating Climate Information into action in Water Resources Management **WANG Guoqing and TRAN Thuc**

Activities	Actions	Outputs	Resources	Milestones	Linkages	Progress
1. Improvement in adaptation capacity of water resources systems in a changing climate (2.1.2) 2. Assessment of basin-wide water resources availability, including use of climate predictions (3.3.2) 3. Improvement in capacity for water-related disaster management (Hydrological extremes) (2.1.3)	• Assessment of changes in climate - Data and method of climate study: Data inventory, climate variables, methods – (Priority A) - Trend of some climate variables: temperature, rainfall and other extremes – (Priority A) - Changes in atmospheric circulation affecting climate extreme: e.g., Monsoon, typhoon and tropical depression, El Nino and Southern Oscillation – (Priority C) - Change in climate affecting natural physical environment: e.g., drought, extreme rainfall, flood, sea water level – (Priority C)	• Assessment report on climate change for participating countries	• WGHs • WMO Secretariat • NHRI, China • CMA, China • IMHEN, Vietnam • Other countries	• Report to be submitted (May 2015) • Reports to: AWG-II • Documents as required • Workshop if needed	• WGHs • RA2 • WMO Secretariat • CHY	• In progress
	• Conduct climate projections – (Priority A) - Statistical downscaling - Dynamic downscaling	• Climate change scenarios for participating countries		• Report to be submitted (May 2015)		
	• Assessment of potential hydrological impacts of climate change on water resources of some selected river basins – (Priority A) - Temperature - Rainfall - Evapotranspiration - Flood and inundation - Drought - Water Resources	• Report on the impacts of climate extremes and climate change to water resources		• Report to be submitted (Dec 2015)		
	• Translating climate and climate change information into actions in water resources development and management – (Priority A) • Case study for a selected??	• Report of case study		• Report to be submitted (Feb 2016)		

Activities	Actions	Outputs	Resources	Milestones	Linkages	Progress
4. Development of national and regional capacity building programs and related training activities for hydrological service (3.3.4)	• Synthesize report from individual reports from participating countries in the RA II – (Priority A)			• Report to be submitted (May 2016)		
	• Lessons learnt and experience sharing – (Priority B)					

WORKPLAN: Improved Accuracy of Hydrometric and Sediment Observations including Space-based Technologies **Youngsin ROH**

Activities	Actions	Outputs	Resources	Milestones	Linkages	Progress
1. Reliability of quality control procedure applied on data collected from hydrological stations (2.2.1)	- Assess the performance of hydrometric instruments and techniques of observations (Priority C)					
	- Prepare documentation for the inter-comparison of instruments and methods of observation (Priority C)					
2. Hydrometric measurements with quality and accuracy (2.2.2)	- Provide guidance on the use of appropriate instruments and methods of observation in diverse conditions (Priority A) - Collection of existing technical information in IRDMIS ➢ Measurement instrumentation (ADVM) ➢ Methods of discharge calculation ➢ Construction and operation of IRDIMS - Case study on measurement by IRDMIS (52 sites) ➢ Measurement of tidal influenced discharge ➢ Measurement under backwater conditions caused by weirs, sluice gates, and river junctions ➢ Evaluation of measurement results ➢ Development of index velocity ratings - Writing Technical report about construction and management by field characteristics	• Provide Technical report and guideline to design, install and operate facilities for Integrated Real-time Discharge measurement system(IRDIMS) • Software System and manual for data QC and evaluation of IRDIMS • Technical report	• Republic of Korea(ROK)	• Provide Technical report and guideline with case studies - Nov 2016 • Collection of the existing technical information of IRDIMS - Dec 2015 • Collection of construction, measurement cases and management of IRDIMS (52 sites more) - Dec 2015 • Writing technical report about construction and management by field characteristics - Nov 2016	• CHy • ROK	• In progress

Activities	Actions	Outputs	Resources	Milestones	Linkages	Progress
	- Improve sediment measuring techniques (Priority B) - Collection of existing technical information ➢ The status of existing sediment measurement techniques ➢ The status of new technologies and their applications ➢ The status of analysis methods - Case studies on sediment measurements under various conditions (15 - 20 sites) ➢ Analysis of river construction effect on characteristics of sediment load, focused on 4 major river projects in Korea ➢ A comparative analysis on sediment load by sequence of rainfall event - Writing Technical report about sediment measurement method and analysis of field characteristics	- Technical report on sediment measurement methods	- Republic of Korea (ROK)	- Provide technical report and guideline with case studies - Nov 2016	- CHy - ROK	
	- Assess the accuracy and use of space-based observation (Priority C)					
3. Calculation of run-off with quality and accuracy (2.2.3)	• Focus on the development of rating curve - Collection of existing technical information (Priority B) ➢ On major procedures for rating curve development ➢ On tools for rating curve development - Case analysis with various field conditions ➢ On development of rating curves when backwater conditions exist (weir, junctions) - Writing technical report on rating curve development	• Report on methods to develop rating curves	• Republic of Korea (ROK)	• Provide Technical report and guideline with case studies - Nov 2016	• CHy • ROK	
	• Detect trends and variability in selected river basin in the region (Priority C)					

Activities	Actions	Outputs	Resources	Milestones	Linkages	Progress
	• Provide guidelines for calculating runoff data accuracy (Priority C)					
4. Establishment of Quality Management Frameworks for Hydrology using current guidance materials for hydrology and water resource management (3.3.3)	• Encourage and facilitate exchange and training on relevant know-how (Priority C)					
5. Development of national and regional capacity building programmes and related training activities for hydrological services (3.3.4)	• Encourage and facilitate exchange and training on relevant know-how (Priority C)					

WORKPLAN: Sediment Disasters and Mass Movements **Tai-Hoon KIM**

Activities	Actions	Outputs	Resources	Milestones	Linkages	Progress
1. Issuance of landslide/debris flow warnings and consistently improving upon them	• Collect and disseminate materials for assessment of sediment disasters (Priority A) • Investigate warning technologies based on adaptive concepts (Priority B) • Generate sediment disasters risk map (Priority C)	• Guidance materials for implementation of adaptive sediment disasters risk management tools with identification, reduction and evacuation	• Republic of Korea (ROK) • National Disaster Management Institute (NDMI)	• Case study report for present systems for sediment disasters management - May 2015 • Analyzing models for the integrating system - Oct 2015 • Report for adaptive sediment risk management tools - Aug 2016	• SOP 2.2.6 • RA II • WMO Secretariat • ROK (MPSS)	• In progress
2. Improvement in capacity for sediment disaster management (2.1.3 in OP)	• Attend seminars on sediment disasters in order to communicate and cooperate among member countries (Priority A) • Share and bring related technologies to developing countries (Priority B)	• Workshop on the provision of sharing knowledge for sediment disasters (e.g. attend workshop of TC DRR) • ODA projects which transplant knowhow to developing countries	• Republic of Korea (ROK) • National Disaster Management Institute (NDMI) • WMO/ESCAP Typhoon Committee, Disaster Risk Reduction (TC DRR)	• Report for feasibility survey for ODA projects by April 2016 • Attend Workshop of TC DRR on May 2015 • Strategy plan for distributing adaptive sediment risk management tools - Oct 2016 • Submission draft to MG for review (TBA)	• SOP 2.1.3 • RA II • WMO Secretariat • TC DRR • ROK (MPSS and KOICA)	• In progress

Activities	Actions	Outputs	Resources	Milestones	Linkages	Progress
3. Optimization of disseminating sediment disasters related information	• Collect and analyse disseminating methodologies and related policies for sediment disasters information that alarm people not to be involved to the designated areas	• Standard Operation Plans for sediment disasters information by public broadcasting system and other media (e.g., Facebook, Twitter, etc.)	• Republic of Korea (ROK) • National Disaster Management Institute (NDMI)	• Summary report for present disseminating codes and regulations by June 2015 • Report about the effective disseminating framework by Dec. 2015	• Above SOP • RA II • WMO Secretariat • TC DRR • ROK (MPSS)	• In progress

4. PRESENTATIONS FOR WWF7 REGIONAL SESSION AND MAIN MESSAGES

4.1 The group was provided with some suggested revisions and approaches to be taken in finalizing their presentations for the WWF7 Regional Session. Discussions were also held on establishing the key messages to be conveyed to the audience by way of each presentation and for the Expert Panel Discussion.

4.2 Outcome statements from the Regional Session were prepared and presented to the Asia-Pacific Regional Synthesis and Commitment Session at the WWF7 by Mr Sung Kim.

5. NEXT MEETING

5.1 Participants were informed that the Government of Korea might have funding to support a 3rd meeting of the RA II WGHS. Mr Sung Kim noted that it would be best to hold such a meeting possibly the week of 10 or 23 October 2016. It was expressed that the meeting could be held in Thailand at ESCAP. This would allow for the group to present their achievements and to brainstorm on priorities for the WGHS for the next four year period. Having the meeting at that time would also assist Mr Kim in preparing his report for the RA II Session to be held probably near the end of 2016.

6. ADOPTION OF THE REPORT AND CLOSURE OF THE MEETING

6.1 Participants agreed that the final draft report would be circulated to participants allowing a period for Mr Sung Kim to update the work plan with members who were not in attendance. Once their views have been incorporated, the draft report will be circulated to participants with a two week period for provision of revisions. It was agreed that the final endorsement of the report should be sought from the Chair of the Working Group before finalizing it and broadly disseminating it.

6.2 The Chairperson, Mr Sung Kim, thanked the participants and the WMO Secretariat for their contributions and professionalism that made the meeting a success. Mr Kim also thanked the representative of CHy for providing a close link between the work of the Commission and the RA II WGH. He noted with appreciation the links established between the WMO RA II WGHS and the Commission for Hydrology that was made possible through the contributions provided by Mr Z. Liu, Vice-president of CHy. He also thanked Mr Paul Pilon for the effective conduct of the meeting.

6.3 Mr Liu thanked the Government of Korea for providing funding assistance and for hosting the meeting. He congratulated the participants on the results of the meeting and reiterated the need for continuing an enhanced cooperation between CHy and the RA II WGHS.

6.4 Mr Pilon expressed his gratitude to the Government of Korea for providing financial assistance, as without this funding the second session of the RA II WGHS would not have been held. He also thanked Mr Sung Kim, Mr Cheolhee Jang and all staff in supporting the effective organization of the meeting and for their hard work in organizing the WWF7 Regional Session on Hydrological Services in Asia under Rapidly Changing Conditions. In closing, he underscored the importance of fulfilling the work plans, not only for the benefit of National Hydrological Services in RA II, but for all Regions.

6.5 The meeting closed on 14 April 2015, with participation at the Regional Session and the Asia-Pacific Regional Synthesis and Commitment Session on 16 April 2015. Individuals were available to participate on 16th April at the WWF7.

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ANNEX 1: LIST OF EXPERTS

Meeting of RA II (Asia) Working Group on Hydrological Services (WGHS)
(Seoul, Republic of Korea, 30 September - 2 October 2014)

Working Group on Hydrological Services (WGHS)

Chairperson **(HOST)**	Dr Sung KIM Senior Research Fellow Korea Institute of Civil Engineering and Building Technology (KICT) 283 Goyangdae-ro, Iisanseo-gu, Goyang-si, Gyeonggi-do 411-712 Republic of Korea Telephone: +82 31 910 0602 Telefax: +82 31 910 0251 E-Mail: sKim@kict.re.kr
Vice-Chairperson WGHS (absent)	Mr Muhammad RIAZ Pakistan Meteorological Department Flood Forecasting Division 46 Jail Road LAHORE Pakistan Phone: +92 42 99 200 208 fax: +92 42 99 200 209 E-Mail: riaz1962@hotmail.com
Theme Leader in Water Resources Assessment	Ms Ge GAO National Climate Center China Meteorological Administration No. 46 Zhuang-guan-cun Nan-da-jie Haidian District Beijing 100081 China Telephone: +8610 68406915 Telefax: +8610 68406975 E-Mail: gaoge@cma.gov.cn
Theme Leader in Water Resources Assessment	Dr Hwirin KIM Han River Flood Control Office Ministry of Land, Infrastructure and Transport 328, Dongjakdaero, Seocho-gu Korea 137-049 Telephone: +82 2 590 9973 Fax: +82 2 590 9989 Email: hydro@korea.kr
Theme Leader in Hydrological Responses to Climate Variability and Change and Promotion of the Use of Climate Information by Water Managers	Dr Guoqing WANG Nanjing Hydraulic Research Institute 225 Guangzhou Road Nanjing 210029 China

	Tel: +8625 85828531 Fax +8625 85828555 E-Mail: gqwang@nhri.cn E-Mail: guoqing_wang@163.com
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Theme Leader in Hydrological Aspects of Drought (absent)	Ms Irina DERGACHEVA Research Hydrometeorological Institute of Hydromet Ahmad Yugnaki, 30-40 Tashkent 100052 Uzbekistan Telephone: +998 71 2359140 E-Mail: Dergacheva_iv@mail.ru
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ANNEX 2: FINAL MEETING AGENDA

World Meteorological Organization **RA II - WGHS/Doc. 1**

REGIONAL ASSOCIATION II
WORKING GROUP ON
HYDROLOGICAL SERVICES

GYEONGJU, REPUBLIC OF KOREA
14 TO 16 APRIL 2015

Submitted by: Secretariat
Date: 14.04.2015
Original Language: English
Status: **FINAL**

14th April 2015 (Place: Mars Meeting Room at Daemyung Resort, Gyeongju)

09:00 - 10:00 ***2nd WGHS Morning Session:***

- Introduction and Welcome (TBD)
- Meeting objectives and adoption of the agenda
- Report on activities of the Commission for Hydrology (CHy) as a result of the 2nd AWG Meeting, September 2014
- Report on decisions and recommendations of RA-II, including the RA-II Strategy as a result of the 1st Conference of RA-II, December 2014
- Discussion on follow-up and implementation of action items as a result of the CHy and RA-II sessions
- Discussion on WWF Session for Hydrological Services

10:00 - 12:00 ***2nd WGHS Morning Session:***

Discussion of activities and adjustment of work plans

- Water Resources Assessment
- *Break (15 mins)*
- Flood forecasting

12:00 - 14:00 *Lunch*

14:00 - 18:00 ***2nd WGHS Afternoon Session:***

Discussion of activities and adjustment of work plans

- Hydrological Aspects of Drought
- Hydrological Responses to Climate Variability and Change and Promotion of the Use of Climate Information by Water Managers for adaptation of climate change in the context of climate variability in hydrological cycle in each country.
- *Break (15 mins)*
- Improved Accuracy of Hydrometric and Sediment Observations including Space-Based Technologies
- Sediment Disasters and Mass Movements

- Wrap up for the day

18:30 - 20:30 — *Welcome Dinner (hosted by the Director of the Han River Flood Control Office, Ministry of Land, Infrastructure and Transport)*

15th April 2015 (Place: WWF venue Room 201 Gyeongju Hyundai Hotel, Gyeongju)

09:00 - 11:00 — ***Regional Process Session of 7th World Water Forum 2015 (Hydrological Services in Asia under Rapidly Changing Conditions):***

09:00 - 09:05 — Introduction and Opening (Dr Sung KIM, Korea Institute of Civil Engineering and Building Technology and Chairperson of WMO RA-II Working Group on Hydrological Services)

09:05 – 09:10 — Opening Remarks (Mr Ha-joon PARK, Han River Flood Control Office , MLIT, Republic of Korea)

09:10 - 10:25 — Presentations (15 minutes each) (Moderator: Dr Cheolhee CHANG, Republic of Korea)

- WMO Hydrological Services (Dr Paul PILON, WMO)
- Hydrological Practices under Climate Change (Dr Guoqing WANG, China)
- Sediment Disasters (Dr Tai-Hoon Kim, Republic of Korea)
- Flood Forecasting (Dr Sergey BORSHCH, Russian Federation)
- Water Resources Assessment (Dr. Hwrin KIM, Republic of Korea)

10:25 - 10:50 — Expert Panel Discussion (Moderator: Dr. Zhiyu LIU, Vice President of WMO Commission for Hydrology)

- Ms. Ge GAO (National Climate Center, China)
- Dr. Yeong-sin ROH (Hydrological Survey Center, Republic of Korea)
- Dr Wolfgang GRABS (International Water Affairs, Germany)

10:50 - 10:55 — Questions and Comments by participants

10:55 - 11:00 — Concluding Remarks (Dr. Zhiyu LIU, Vice President of WMO Commission for Hydrology)

11:00 - 11:15 — *Break*

11:15 – 12:00 — Drafting of Session Outcomes for the Regional Synthesis Session

12:00 – 13:00	*Lunch*
13:00 - 18:00	*Afternoon Session:* Individual participation in WWF

Alternative session for Sung KIM and Paul PILON:

14:40 - 19:00	***Asia-Pacific Regional Synthesis and Commitment Session at the 7th World Water Forum:***
14:40 - 14:50	Opening remarks (Mr. Yoshiro Mori)
14:50 - 14:55	Remarks (Mr. Jung-moo Lee)
14:55 - 15:10	Regional Water Security Status: Asian Development Bank
15:10 - 16:40	Regional Synthesis: Representatives from 10 session groups
16:40 - 17:00	*Break*
17:00 - 17:10	Summary of Asia-Pacific regional outcomes of the 7th World Water Forum (Mr. Ravi Narayanan)
17:10 - 18:40	Regional Commitments (High-level Dialogue)
18:40 - 18:55	Audience interactions
18:55 - 19:00	Closing (Mr. Ravi Narayanan)
16th April 2015	(If required or individual participation in WWF)
09:00 - 09:15	Summary of Day 1 and Day 2
09:15 - 10:15	Review of Activities
10:15 - 10:30	Next Steps
10:30 - 10:45	*Break*
10:45 - 12:00	Drafting of Meeting Report
12:00 – 13:00	*Lunch*
13:00 - 14:00	Review of Meeting Report
14:00 - 14:30	Adoption of Meeting Report
14:30 - 14:45	*Break*
14:45 - 15:30	Summary and Closing Remarks
15:30 - 18:00	*Afternoon Session:* Individual participation in WWF

Working Group on WMO Integrated Global Observing System and WMO Information System (WG-WIGOS/WIS)

CHEN Yongqing
China Meteorological Administration

1. Introduction

In the fifteenth session of Regional Association II which was held in Doha, Qatar, from 13 to 19 December 2012, the Regional Association II Working Group on WMO Integrated Global Observing System and WMO Information System (WG-WIGOS/WIS) was re-established to bear the responsibility of facilitate the accomplishing of missions of WIGOS and WIS.

Some activities have been carried out by the working group since RA II -15.

2. Working Group Structure

The Working Group is composed of Expert Group on WIGOS (EG-WIGOS) and Expert Group on WIS (EG-WIS). Both EG-CS and EG-AgM consist of two co-coordinators and several theme leaders. In addition, a number of volunteer experts who are expected to assist the tasks of each Expert Team have also been registered.

3. Terms of Reference

(a) To monitor and coordinate the implementation of WIGOS and WIS in the Region; propose measures for improvements, especially for overcoming gaps, deficiencies and inconsistencies in the implementation of these systems; and promote active involvement of the Members of the Region in the implementation of these systems;
(b) To advise on and provide overall technical guidance, assistance and support to the Members of the Region for the implementation of WIGOS and WIS at the regional and national levels;
(c) To promote capacity-development and outreach activities to assist Members in the implementation of WIGOS and WIS;
(d) To liaise with the relevant RA II Working Groups on matters related to WIGOS and WIS implementation;
(e) To advise the president of the Association on matters concerning the implementation of WIGOS and WIS in the Region;
(f) To provide the president of the Association with recommendations for presentation under appropriate agenda items in sessions of technical commissions, joint sessions of the presidents of technical commissions and presidents of regional associations, and the Executive Council;

4. Membership

Expert Group on WIGOS (EG-WIGOS)

EG-WIGOS		
Co-Coordinators	Mr Yongqing Chen	China
	Dr Jaegwang Won	Republic of Korea
Theme Leader in Implementation and Updating of R-WIP	Mr Yoshiro Tanaka	Japan
Theme Leader in Implementation of EGOS-IP	Mr Yatian Guo	China
Theme Leader in Standard and Best Practice	Dr Seongchan Park	Republic of Korea
Theme Leader in Observational Requirements and Regional Network	Mr D. K. Malik	India
	Mr Abdulqaleq Ali Ali	Iraq
Theme Leader in Data Availability and Quality of Observations	Mr Yoshihisa Kimata	Japan
Theme Leader in Surface-based Remote Sensing for Disaster Risk Reduction	Mr Feng Li	China
	Dr Oleg Pokrovsky	Russian Federation
Theme Leader in Satellite Data, Products and Training	Mr Tomoo Ohno	Japan
	Dr Dohyeong Kim	Republic of Korea

Expert Group on WIS (EG-WIS)

EG-WIS		
Co-Coordinators	Ms Xiang Li	China
	Mr Kenji Tsunoda	Japan
Theme Leader in Data Communication Techniques and Structure	Dr Sunghoi Huh	Republic of Korea
Theme Leader in Data Representation and Metadata	Ms Jitsuko Hasegawa	Japan
Theme Leader in WIS-GTS operations, including Early Warning	Dr Shyamlal Singh	India
	Mr Aleksandr Soloveychik	Uzbekistan
Theme Leader in Climate Data Management/Data Rescue	Mr Hongzheng Zhang	China
Theme Leader in Integrated Global Data Dissemination System	Mr Kang Gao	China

5. Completing of membership Working Group on WIGOS and WIS

In accordance with resolution 11 of RA II-15, there are an Expert Group on WIGOS (EG-WIGOS) and an Expert Group on WIS (EG-WIS) under WG-WIGOS/WIS. Each of these two expert groups consists of two Co-Coordinators and some Theme Leaders and Volunteer Experts. Mr. Yongqing Chen (China) and Dr. Jaegwang Won (Republic of Korea) were approved to be Co-Coordinators of EG-WIGOS in the session, and meanwhile, Ms. Li Xiang (China) and Mr. Kenji Tsunoda (Japan) were approved to be Co-Coordinators of EG-WIS.

Co-coordinators of EG-WIGOS and EG-WIS initially proposed the lists of Theme leaders (areas) of EG-WIGOS and EG-WIS in accordance with Terms of reference (TOR) of EG-WIGOS and EG-WIS, the R-WIP-II approved by XV-RA II, as requested by the WMO secretariat.

The theme areas of EG-WIGOS focus mainly on how to carry out main projects in the R-WIP-II. The list of Theme leaders (areas) of EG-WIGOS is as follows,

(a) Theme leader in Implementation and Updating of R-WIP;

(b) Theme leader in Implementation of EGOS-IP;

(c) Theme leader in Standard and Best Practice;

(e) Theme leader in Observational Requirements and Regional Network;

(f) Theme leader in Data Availability and Quality of Observations;

(g) Theme leader in Surface-based Remote Sensing for Disaster Risk Reduction;

(h) Theme leader in Satellite Data, Products and Training.

The Theme areas of EG-WIGOS focus mainly on coordinating and promoting WIS implementation, operation and services, including GTS and IGDDS, and data management in RA II. The list of Theme leaders (areas) of EG-WIS is as follows,

(a)Theme Leader in Data Communication Techniques and Structure

(b)Theme Leader in Data Representation and Metadata

(c) Theme Leader in WIS-GTS operations, including Early Warning

(d)Theme Leader in Climate Data Management/Data Rescue

(e)Theme Leader in the Integrated Global Data Dissemination System

Then, Theme Leaders of both EG-WIGOS and EG-WIS were nominated by members and finally decided by the management group (MG-7) in May 2013.

The Theme Leaders are expected to lead the activities in their respective theme areas in close coordination with the Members in the Region, monitoring the key performance indicators/targets concerned, and reporting progress of development and implementation to the Expert Group Co-Coordinators concerned.

After that, Volunteer Experts for EG-WIGOS and EG-WIS were also nominated by members finally approved by President of RA II in October 2013.

Therefore, the WG-WIGOS is composed of two co-coordinators, 10 theme leaders and 13 Volunteer Experts, while the WG-WIS is composed of two co-coordinators, 6 theme leaders which and 12 Volunteer Experts.

6. Drafting the Work Plan of Working Group

As requested by WMO secretariat, a work plan for the WG-WIGOS/WIS was developed by coordinators of Expert Group on WIGOS and Expert Group on WIS, with the help of theme leaders and WMO secretariat. The work plan for the WG-WIGOS/WIS has been submitted to WMO secretariat by the end of October 2013.

The work plan is developed mainly based on the deliverables outlined in the RA II Strategic Operating Plan, the terms of reference of the Expert Group, and the projects listed in the R-WIP-II, and would like to outline the main tasks which will be carried out by the Working Group before the next session and key deliverable, activity, expected accomplishing time and responsibility.

Nine tasks for EG-WIGOS were established in the work plan and each task includes several activities which will be accomplished in the expected years. Most of activities will be implemented through the RAII WIGOS projects and RA II members under the initiative of key regional players. The theme leaders of EG-WIGOS have responsibility to track and promote the execution of these activities and projects. Key deliverables for EG-WIGOS in the work plan are as follows,

(a) A new version of R-WIP-II will be developed in 2015
(b) Portal to share progress EGOS IP implementation in RA II will be available in 2015
(c) A portal on standards and best practices will be available in 2015
(d) Collaborative working mechanism toward integrated surface-based remote sensing observations in the East Asia for operational monitoring and forecasting severe weather will be established.
(e) Technical support for instrument maintenance and calibration by experts from RICs will be provided.
(f) ISO/IEC 17025 certification will be obtained.
(g) Report on status on QC/QA procedures and site management in RA II will be available.
(h) Reports on status on meteorological instruments, calibration and training in Regional Association II will be available.
(i) Capacity in use of satellite data/products and facilitation of training datasets and tool boxes will be improved.
(j) The systematic Near Real Time monitoring of sand and dust storm will be carried out in SDS-WAS Asia Node.
(k) RBSN and RBCN will be updated.

Seven tasks for EG-WIS were established in the work plan and each task includes several activities which will be accomplished in the expected years. The theme leaders of EG-WIS have responsibility to carry out or promote these activities. Key deliverables for EG-WIS in the work plan are as follows,

(a)RA II- WIS-IP (2013: first version, 2014-2016: review and update)
(b) Status and Plans of RMTN in RA II (2014-2016)
(c) Amendments of Volume II of the manual on the GTS in RA-II (2016)
(d) Status Report of Data Representation and Metadata in RA II (2014-2016)
(e) Status Report of the implementation of WIS service and WIS monitoring in RA II (2014-2016)
(f) Status Report of the Climate Data Management/Data Rescue in RA II (2014-2016)
(g) Status Report on IGDDS in RA II (2014-2016)

Each theme leader in the expert group, supported by volunteer experts if available, will bear responsibility for one or several tasks in the plan which is relevant to his or her theme area and will submit report to co-coordinators of the expert group as required.

7. Develop and Publish RA II Regional WIS Implementation Plan

The fifteenth session of RA II reviewed the draft RA II Regional WIS Implementation Plan, and agreed that fully implementing WIS in the Region was an essential step toward the efficient implementation of WIGOS, GFCS and other priority areas.

The fifteenth session of RA II agreed that the virtual WIS Implementation Project Office should continue to refine the plan, and encouraged WIS centers, in particular GISCs to provide resource toward completing the implementation plan.

EG-WIS co-coordinators drafted a work plan on developing RA-II WIS Implementation Plan in April, 2013, and a Task Team for reorganizing and finalizing the RA-II WIS-IP (the coordinator of EG-WIS) was established in May, 2013. Members came from GISCs and GISC candidates, which included Beijing, Jeddah, New Delhi, Seoul, Tehran, Tokyo and DCPC/NC Bangkok, Doha and Karachi.

Based on the previous progress and outcome of developing of RAII-WIS-IP during 2011-2012, the Task Team reorganize and compile the draft of RAII-WIS-IP in September, 2013.

The draft RAII-WIS-IP was completed and distributed to the WIS focal points of RA II members and the WMO secretariat for comments in September, 2013.The draft was reviewed by the Chairperson of WG-WIGOS/WIS of RA-II October, 2013.

The final version of RA-II WIS-IP (available at: http://wis.wmo.int/file=653) was submitted to the President of RA-II for approval November, 2013 and was approved by the President of RA-II in December, 2013.

8. Monitoring progress on implementation of WIGOS and WIS

Theme leaders of EG-WIGOS and EG-WIS are responsible for the monitoring of progress on each project of IP-WIGOS and WIS in close cooperation with the contact person of main players of the Project.

8.1 Status of implementation of WIGOS

The implementation of R-WIP-II will mainly rely on seven RAII WIGOS projects listed in the R-WIP-II. Seven project contact persons provided progress information to the co-coordinator of EG-WIGOS. The progress for each project is listed as bellow.

8.1.1 Project No. I- Monitor and review the Implementation of EGOS- IP in RA II

Accomplishments

The responsibility for the project was assigned to CMA Meteorological Observation Centre (MOC) by CMA. A small expert team was established by MOC. Then, a work plan and a technical scheme were drafted, and a project framework was designed. The budget plan for the project was also developed by the expert team and has been submitted to CMA for approval.

Next steps

Responding to aim of the project, a portal is plan to be developed by the expert team to share progress on implementation of EGOS-IP by RA II Members, meanwhile, gaps will be Identified and prioritize actions will be listed in EGOS-IP through reviewing progress on implementation of EGOS-IP in RA II as next steps.

8.1.2 Project No. II- Standard and Best Practice Portal, including Technical Documents with Necessary Details in English from all RA II Members

Accomplishments

KMA is responsible for this project. KMA's domestic project for the standardization of meteorological observation has been ended its 1st phase in 2013. More than 3,516 domestic sites from 27 agencies, including local governments and government-owned cooperations, were linked into one system. 70% of the data from more than 3,516 sites are collected for the utilization in real time by 2013, including KMA's 570 sties. By the end of 2014, 80% of the data could be collected and checked as 'normal', and utilized by the member agencies. (In September 2014, 2,489 sites of 80.4%) Based on the government policy of ROK, all the data collected would be open to the public and could be utilized by the industries related with meteorological, hydrological services and disaster reduction, etc.

Next steps

In 2015, a web page(a portal) will be developed to share the experience about standards and best practices for enhanced observational data/products utilization. KMA's standardization project will be the first sample of experience, and a form will be also developed to collect the standard and best practices from other members within RA II. Through this portal, it is expected that RAII members would share their experiences or activities more regarding data exchange, sensor inter-comparison or inter-calibration in domestic or international scope.

8.1.3 Project No. III.1 - Observing systems integration for supporting disaster risk reduction - Integration of Surface-based Remote Sensing Data in the East Asia

Accomplishments

Real-time exchange of radar CAPPI products and automated weather station data between Japan and Korea

The Japan Meteorological Agency (JMA) and the Korea Meteorological Administration (KMA) mutually agree to exchange radar CAPPI products and automated weather station (AWS) data in near real-time basis to use for operational purpose. In near real-time, KMA obtains radar 2km-height pseudo CAPPI products of JMA's weather radar stations as well as hourly data of JMA's surface observation network, called the Automated Meteorological Data Acquisition System (AMeDAS). JMA also obtains radar CAPPI products of KMA's weather radar stations as well as most data of KMA's AWSs in near real-time.

JMA succeeded in generating experimentally a two-dimensional grid product of analyzed precipitation over the region of the Republic of Korea using the radar CAPPI data and in-situ precipitation data of AWSs. JMA is now developing a quality control system to remove noise from radar CAPPI products. JMA plans to improve the analyzed precipitation by introducing the quality control system and investigate its impact on NWP in near future.

Non-real-time exchange of raw data of Doppler radar between Japan and Korea

JMA and KMA also agree to exchange raw data of their Doppler radars in off-line basis to investigate the benefit of operational use of these data in individual NWP system.

In March 2013, JMA obtained a set of raw data for 5 days of July 2012 on the case of heavy rainfall over Kyushu Island from KMA. It was revealed that a quality control was necessary to use such raw data in a meso-scale NWP system.

Dissemination of ground-based stations of the Global Navigation Satellite Systems on WIS/GTS

Data of ground-based stations of the Global Navigation Satellite Systems (GNSSs) are disseminated on WIS/GTS in real time so that these data are available for operational use. Table 1 shows a list of such ground-based GNSS stations in China, Korea and Japan. At the Joint Meeting of the 12th Asia Pacific Satellite Data Exchange Meeting and 24th North America / Europe Data Exchange Meeting (22-25 October 2012, Met Office, Exeter, U.K.), CMA, JMA and KMA were requested to provide data of more ground-based GNSS stations on GTS. It is, therefore, expected to increase the data amount in the future.

In Korea, there are several agencies that are operating several GNSS stations for their own purpose, and they have recently agreed on sharing the data for mutual benefits. More than 136 stations would be available, 73 of them are collected by KMA including 21 stations under KMA's responsibility. The number of GNSS stations is expected to be increased continuously. Currently, the quality control system for the NWP model assimilation is under development by KMA. The discussion regarding the international data exchange is going on, and the system for formatting and broadcasting via WIS will be prepared by 2016.

Table 1 List of Ground-based GNSS Stations whose data are disseminated on WIS/GTS

Country	Station Name	Longitude (East)	Latitude (North)
China	Wuhan(WUHN-MET)	114.36	30.53
	Lhasa(LHAZ-MET)	91.10	29.66
Japan	Usuda(USUD-GOP)	138.36	36.13
Korea	Daejeon(DAEJ-MET)	127.37	36.40

Since the technical method to assimilate zenith tropospheric delay data or total precipitable water vapor data of ground-based GNSS stations is established, the data on WIS/GTS can be used for operational purpose.

Next steps

Progress of the JMA-KMA projects will be monitored, and the benefit and difficulties of regional exchange of surface-based remote sensing observations will be identified. More members are also encouraged to exchange surface-based remote sensing observations. In this regard, each contact person will seek possibility to establish a pilot project to realize such data exchange as a trial in coming two years.

In the last year of this RA II WIGOS Project, i.e. 2016, a feasible and optimal draft design of integrated surface-based remote sensing observations will be developed based on lessons learnt from these projects.

8.1.4 Project No. III.2 -Observing systems integration for supporting disaster risk reduction - Capacity Building in Radar Techniques in the Southeast Asia

Thai meteorological Department (TMD) cooperated with JMA under Japan-ASEAN Integrated Fund (JAIF) in Capacity building in Radar Techniques – Radar network, precipitation radar estimates and radar maintenance for ASEAN members in 2014, with experts seconded from JMA, supported by JAIF and WMO. Regional Training Workshop on Weather Radar Basis and Routine Maintenance and Real-Time Radar Rainfall Estimation and Forecasting was held in Bangkok, on 24 February to 7 March 2014, with 20 participants from 7 ASEAN countries (Indonesia, Lao PDR, Malaysia, Philippines, Singapore, Thailand and Viet Nam), one expert from JMA, one expert from Japan Radio, and one expert from WMO were involved. The workshop was highly successful.

In 2013, 2014, TMD's personnel were sent to JMA to discuss and learn on both radar network and precipitation techniques. Currently, radar network technique used by JMA were transferred to TMD's personnel and made the radar composite network for Thailand feasible, pending the overhaul of the radar operation synchronization of TMD. Further transfers of precipitation quantitative estimation is underway with the close cooperation with JMA.

Unfortunately, during ASEAN SCMG's meeting in Vientiane, LAO PDR in September 2014, the meeting was informed on Malaysia's withdrawal from the joint project of ASEAN Radar Composite between Thailand and Malaysia. Thus, it seems very difficult to continue the transboundary radar composite network planned in the R-WIP-II.

8.1.5 Project No. IV - RA II WIGOS Project to Enhance the Availability and Quality Management Support for NMHSs in Surface, Climate and Upper-air Observations

Accomplishments

Based on the mailing list established for the members of coordinating group of RA II Pilot Project to Enhance the Availability and Quality Management Support for NMHSs in Surface, Climate and Upper-air Observations (approved by 14th session of RA II, Tashkent, December 2008), information has been exchanged through the mailing list which was periodically updated.

WMO/JMA Survey on meteorological instruments, calibration and training in RA II was implemented, and a consolidated report, which describes status on calibration instruments for surface-based observations in RA II was completed and made available on the WMO Regional Instrument Centre (RIC) Tsukuba website. At the same time, the report was submitted to the WMO secretariat for its review and consideration to publish it as WMO IOM report.

The results of the RSMC quality monitoring (analysis of differences between the surface observations and the corresponding first-guess fields of 6-hour forecasts of JMA's global model)) have been shared among members concerned.

To achieve one of the expected key results (provision of technical support for instrument maintenance and calibration by experts from RICs), experts from RIC Tsukuba visited the Bangladesh Meteorological Department (BMD) and provided practical on-the-job training on meteorological instrument aiming at establishing the operational calibration system using meteorological standards (barometer and thermometer) donated in the framework of JICA technical cooperation project.

Next steps

Theme Leader has developed a draft of the investigation survey on quality management of meteorological observation by NMHS in RA II. The survey will be circulated among RA II Members after review and update process by the coordinating group members.

Based on the survey results, Theme Leader will consider holding a workshop focusing on sharing and transferring skills of observation quality management.

In addition, Theme Leader will consider possibilities to contribute to the improvement of availability and quality management of NMHS in RA II.

8.1.6 Project No. V – Developing a Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) in Asia Node

Accomplishments

The SDS-WAS

The dust forecast model has been continuously operated throughout the year on a daily basis. The model consists of a numerical weather prediction model incorporating on-line parameterizations of all the major phases of the atmospheric dust cycle. It generates forecasts of the following minimum set of variables:

- Dust load (kg·m-2)
- Dust concentration at the surface (μg·m-3)
- Dust optical depth at 550 nm (-)
- 3-hour accumulated dry and wet deposition (kg·m-2)

Forecasts cover the period from the starting forecast time (00:00 and/or 12:00 UTC) up to a forecast time of at least 72 hours, with an output frequency of at least 3 hours. The horizontal resolution is 0.5x0.5 degrees.

A portal for dust forecast products developed

A web portal to display forecast products as well as additional information was developed and operational. The web site is http://eng.weather.gov.cn/dust/.

CBS-Ext .(2014) noted that the Regional Association II (RA II) strongly encouraged China to realize its plans related to sand and dust storm-related services and recommended a demonstration of operational forecasting capabilities, to serve Members of the eastern part of RA II in dust monitoring and forecasting.

Next steps

Dust forecast model products verification will be carried out in the near future.

WMO EC-65 (2013) approved the Commission for Basic Systems (CBS) recommendations made at its fifteenth session in 2012 that mandatory functions and criteria for the designation of an RSMC with activity specialization in Atmospheric Sand and Dust storm Forecasts (RSMC-ASDF) are to be incorporated in the Manual on the Global Data-processing and Forecasting System (GDPFS) (WMO-No. 485). EC-65 also approved the recommendation to formally designate the SDS-WAS regional node in Barcelona, Spain, as the RSMC-ADSF for the region，consisting of. Northern Africa (north of Equator), the Middle East，and Europe. The sixteenth session of Commission for Atmospheric Science (CAS-16) welcomed the initiative to designate another SDS-WAS regional node in Beijing, China, as the RSMC-ADSF for the region consisting of Asia and the Central Pacific. The Extraordinary Session of Commission of Basic System (CBS) 2014 acknowledged the efforts by SDS-WAS Regional Node in Asia in the development of the Asian SDS-WAS portal, data exchange and data policy, and model intercomparison, and therefore requested China, in collaboration with the relevant SDS-WAS Regional Node in Asia, to prepare an assessment document to demonstrate its capabilities in operational sand and dust storm forecasting. The Commission also requested OPAG-DPFS, in collaboration with the SDS-WAS Steering Committee, to coordinate the assessment of the capabilities against the designation criteria stated in the *Manual on the GDPFS* (WMO-No. 485), prior to its formal recommendation for designation. The Commission agreed that the President of CBS would seek approval for designation by EC based on the positive result of the assessment. CMA will prepare an

assessment document and continue to apply for WMO Regional Specialized Meteorological Centers with Activity Specialization on atmospheric Sand Dust Forecasts.

8.1.7 Project No. VI - RA II WIGOS Project to Develop Support for NMHSs in Satellite Data, Products and Training

Accomplishments

Issuance of newsletters to RA II Members.

Quarterly newsletters have been issued to share recent satellite-related information on topics such as imagery data, products and training. The newsletters listed below, which were issued to RA II Members almost at a quarterly interval, contained brief reports on relevant meetings, products progress report, news on successful launch of new satellites and information on preparations for the Himawari-8/9 satellite series of JMA and Geo-KOMPSAT-2A of KMA.

- Vol. 4/No. 1, April 2013

- Vol. 4/No. 2, June 2013

- Vol. 4/No. 3, November 2013

- Vol. 4/No. 4, December 2013

- Vol. 5/No. 1, March 2014

- Vol. 5/No. 2, August 2014

- Vol. 5/No. 3, October 2014

All the past issues can be seen in the following WMO webpage:
https://www.wmo.int/pages/prog/sat/ra2pilotproject-intro_en.php

4th Asia/Oceania Meteorological Satellite Users' Conference

The fourth Asia-Oceania Meteorological Satellite Users' Conference (AOMSUC) was held in Melbourne, Australia from 9-11 October 2013. The conference was hosted and sponsored by the Australian Bureau of Meteorology (AuBOM) and was co-sponsored by the China Meteorological Administration (CMA), the Japan Meteorological Agency (JMA), the Korean Meteorological Administration (KMA), and the World Meteorological Organization (WMO). The conference was preceded by a two day training event at the AuBOM training facilities and brought together participants from Region II and V.

5th Asia/Oceania Meteorological Satellite Users' Conference and VLab training event

The fifth AOMSUC was held in Shanghai, China from 19-21 November 2014. The conference was hosted and sponsored by CMA and was co-sponsored by JMA, KMA, AuBOM and WMO. The conference was preceded by a two day training event at CMA training facilities and brought together participants from Region II and V.

Next steps

The new generation geostationary meteorological satellites such as Himawari-8, FY-4A, GEO-KOMPSAT-2A are planning to be operated from next year, 2015. Therefore, supportive activities for preparation of satellite data users to the new generation of geostationary meteorological satellites will be carried out. The Project will support for preparation of the NMHSs in RA II especially developing countries including LDCs to the

new satellites. It will involve user training, guidance to upgrade processing software and hardware, information and tools.

Issuance of quarterly newsletters will also continue.

JMA will host the sixth AOMSUC in Japan in the fourth quarter of 2015. More details about the conference have not decided yet and will be provided in due course.A two day training event is also planned at the time of the meeting. It will be planned to focus the utilization of new satellite data. The RA II WIGOS Project to develop support for NMHSs in satellite data, products and training will cooperate in it with JMA.

The third meeting of the Coordinating Group of the RA II WIGOS Project will be held in 2015 on the occasion of the sixth AOMSUC.

8.2 Status of implementation of WIS

8.2.1 WIS centres

With the framework of WMO Information System, WIS centres (GISC, DCPC, and NC) have been established by WMO members complying with the WIS technical requirements. As of November 2014, there are 7 GISCs (6 are operational: 85%), 29 DCPCs (23 are endorsed: 79%) with 37 NCs in Regional Association II (RA II). To facilitate the implementation and operation of WIS in RA II, there are various capacity building activities provided by the GISCs, which includes 6 on-site trainings and WIS workshops run by GISC Beijing, 1 workshop organized by GISC Jeddah, 2 workshops organized by GISC Seoul, and 4 workshops organized by GISC Tokyo, in the course of 2013-2014.

8.2.2 WIS componets

As the WIS core network, RMDNC-NG managed by ECMWF has been completed on its migration at the last May, 2014. GISC Beijing, Jeddah, Moscow, New Delhi, Seoul, Tokyo have completed their RMDCN-NG migration or connection to RMDCN-NG, but GISC Tehran has not been connected yet due to the license issue from supplier.

A survey for the status and plans of RMTN in RA II was done in 2014. As of October 2014, the RMTN in RA II includes 88 operational circuits (i.e. 9 MTN, 46 regional, 13 inter-regional and 20 additional circuits). All circuits in operation but four are running on pure TCP/IP. On the other hand, eleven circuits in the Regional configuration plan are not in operation. Especially NMCs Baghdad (ought to have 2 regional circuits), Kabul (3) and Thimpu (1) are isolated from the GTS. Satellite broadcasting systems, including CMACast, Meteoinform, INSAT-DMDD, EUMETCast and etc., are being used for complements to the GTS, backup sources and cost-effective alternatives to HF radio broadcasts.

The status report on IGDDS in RA II was received from the Theme Leader in October 2014. The IGDDS is for the efficient circulation of space-based observation data and products meeting the needs of WMO programmes and regional requirements. It is noted that CMACast began operation in June 2012 and has established data exchange and re-dissemination service with EUMETCast, JMA plans to distribute Himawari-8/9 data via Internet cloud and DVB-S2 based HimawariCast, and KMA is planning for the follow-on geostationary meteorological satellite GEOKOMPSAT-2A which will be launched in May, 2018. In addition, as of March 2014, RARS network now involves 42 direct readout stations which altogether enable acquisition of satellite sounding data from around 80 % of the globe with 30-minute data latency. Another 5 stations is under preparation to fill the gap of the RARS network in South Pacific and strengthen the coverage of Indian Ocean.

8.2.3 Data management

The main activities related to the theme of Data Representation and Metadata include technical consultation and support for Members working on code form migration, monitoring, analysis and questionnaires on the status of migration to Table Driven Code Forms (TDCF) and implementation of WIS discovery metadata. To determine the level of Members' understanding on WIS metadata management and status of implementation, and to assess training requirements on WIS metadata, a questionnaire was sent to RA II Members in October 2013 and received responses from 17 Members by November 2013.

According to the statistics collected every three months from October 2010 to July 2014, (1) notable progress has not been seen with the migration of SYNOP data since 2012, (2) number of BUFR TEMP report increased by about 50 in the first half of 2014, which is attributed to India's BUFR TEMP reports, (3) percentage of Members who report CLIMAT in BUFR format has been remaining around 25% for several years.

Creation and registration of WIS metadata for GTS bulletins in RA-II is showing a good progress in general. GISCs Moscow, Teheran and Jeddah started operation in 2014 and 31 RA-II Members (89%) out of 35 have registered at least one WIS metadata record to the catalogue. The community is waiting for GISC New Delhi to become operational and starting catalogue management for its area of responsibility. Uzbekistan (its principal GISC is Seoul) has not registered its records to the catalogue yet.

ANNEX

RA II WIGOS IMPLEMENTATION PROJECTS

Project No. I

Project Title	**RA II WIGOS Project to Monitor and Review the Implementation of EGOS-IP in RA II**
Type	Regional Implementation Project (RA II)
Status	Draft Design
Overview	A vision for the Global Observing Systems in 2025 which provides high-level goals to guide the evolution of the global observing systems during the coming decades has been approved by EC-LXI in 2009. Accordingly, CBS-15 adopted a recommendation for the Implementation Plan for the Evolution of Global Observing Systems (EGOS-IP) to complement and respond to this Vision. The Implementation Plan outlined the key activities to be implemented during the period 2012 to 2025 aiming at maintaining and developing all WMO component observing systems. Thus, a project can be established to monitor the progress of RA II Members on the implementation of EGOS-IP, analyze gaps in the regional observing network, and therefore, prioritize actions listed in EGOS-IP. The concerned information should be shared by RA II Members and all users by establishing a portal. This project will: ● Encourage RA II Members to appoint National Focal Points and submit EGOS National Reports annually, ● Identify gaps and prioritize actions listed in EGOS-IP through reviewing the progress of EGOS-IP in RA II, ● Develop a Portal to share the progress of EGOS-IP Implementation of RA II Members.
Aim(s)	● To identify gaps and prioritize actions listed in the EGOS-IP through reviewing the progress of the Evolution of Global Observing Systems (EGOS), ● The progress and experiences are shared by RA II members when implementing the EGOS-IP.
Benefits	The Portal will provide Members and users with a platform for sharing updated progress of EGOS-IP implementation in RA II
Key Regional Players	China and Hong Kong, China
Capacity development requirements	● Technical assistance by CBS, ● Workshop(s) on gaps analysis and actions prioritizing listed in EGOS-IP.

Partners/Participants	All RA II Members
Funding Source(s)	This project will rely on existing budget allocations at the national level. Additional funding will be needed to facilitate some elements such as the cost for developing the portal software.
Overall Costs	(TBD)
Timescale	2013–2016
Expected Key Deliverables/Key responsible body	● A list of RA II EGOS National Focal Points, ● Prioritized actions listed in the EGOS-IP, ● Portal to share progress EGOS IP implementation in RA II.
Main risk(s)	Lack of resources (funds/expertise), lack of cooperation and missing or mistaken information from Members
Website	Not available
Summary	This project will develop a Portal that will provide updated progress on EGOS-IP in RA II, identify gaps and prioritize actions listed in EGOS-IP identify regional prioritized actions to be taken.
Date of the update	21 November 2012
Contact Person 1	Ms GUO Jianxia Meteorological Observation Center, China Meteorological Administration (CMA) China Tel: +86 10 68407934 Fax: +86 10 68400936 E-mail: gjxaoc@cma.gov.cn
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Project No. II

Title	**RA II WIGOS Project for Standard and Best Practice Portal, including Technical Documents with Necessary Details in English from all RA II Members**
Type	Regional Implementation Project (RA II)
Status	Draft Design
Overview	This project will develop a Standard and Best Practise Portal including mechanism and procedures needed for a regular updating process.
Aim(s)	● To develop a Standard and Best Practise Portal, ● To establish regional standard and best practices documentation (regional practices database) for enhanced observational data/products utilization, including data/metadata management, ● To specify mechanisms, procedures for regular monitoring and updating of the portal.
Benefits	The standard and best practices portal will enhance and improve quality and utilization of data/products.
Key Regional Player	Republic of Korea
Capacity development requirements	Technical assistance by CBS and CIMO
Partners/Participants	RA II Members
Relationship with existing project(s)	KMA WIGOS demonstration project
Funding Source(s)	This project will rely on existing budget allocations at the national level
Overall Costs	(TBD)
Timescale	2013–2016
Expected Key Deliverables / Key responsible body	Portal on standards and best practices with mechanisms and procedures for regular monitoring and keeping the portal up-to-dated.
Main risk(s)	Lack of resources (funds/expertise), lack of cooperation and missing or mistaken information from Members.
Website	Not available
Summary	This subproject will establish a RA II Portal of standards and best practices for enhanced observational data/products utilization.

Date of the update	21 November 2012
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Project No. III.1

Project Title	**RA II WIGOS Project for Observing Systems Integration for Supporting Disaster Risk Reduction**
Subproject Title	**Integration of Surface-based Remote Sensing Data in the East Asia**
Type	Regional Implementation Project (RA II)
Status	Draft Design
Overview	In order to enhance observing capabilities in severe weather monitoring and forecasting, specifically in East Asia, surface-based remote sensing datasets/ products, such as radar and GPS data, should be integrated for their better utilization. This project, as a first step, aims at developing a feasible and optimal draft design of integrated surface-based remote sensing observations toward future operational assimilation in meso-scale NWP system at the sub-regional level, as well as real-time quality-assured radar composite maps. The project will be Observing System Experiments (OSE) driven and proceed as follows: 1. Offline Exchange of surface-based remote sensing datasets/products including radar echo intensity, Doppler velocity, AWS data, and, if available, GPS precipitable water vapour, together with supplementary information (e.g. data format, details on observations, and data quality) among participating organs. 2. Examination of impacts of assimilation of exchanged remote sensing observation on its NWP performance. Also, sub-regional radar composite maps meeting their own operational requirements will be developed. Results and identified technical issues (e.g. data format, data policies, telecommunication for real-time data exchange, and quality of data) will be shared with and worked out cooperatively by the participating organs. Thus, requirements of data exchange for operational phase will be specified. 3. A feasible and optimal draft design of integration of surface-based remote sensing observations will be developed based on the results of the project. To proceed with this project, existing frameworks such as CMA-JMA-KMA NWP meeting will be expanded to include this project into its agenda.
Aim(s)	The aim of this project is to develop a feasible and optimal draft design of integrated surface-based remote sensing observations toward operational assimilation of those data in meso-scale NWP model of the participating organs at the sub-regional level, as well as real-time quality-assured radar composite maps.
Benefits	Members in East Asia will benefit from this project through enhancement of their capabilities in observations for better early

	monitoring/warning/nowcasting/very short-range forecasting. All the other RA II Members, particularly ones in Southeast Asia which might plan a similar project in the future, will benefit from shared outcomes of this project, namely: (1) solutions to identified issues for integration of surface-based remote sensing observations at sub-regional level; as well as (2) results of impact analysis on capacities in severe weather monitoring and forecasting.
Key Regional Player	China, Japan and Republic of Korea
Capacity development requirements	Workshop(s) on better utilization (decision making & assimilation)
Partners/Participants	CMA, JMA, KMA
Relationship with existing project(s)	1. WMO Workshop on the Impact of Various Observing Systems on Numerical Weather Prediction. 2. CMA-JMA-KMA joint workshop on NWP (The 1st CMA-JMA-KMA joint workshop on NWP was held in September 2011). 3. WMO/CIMO Radar Quality Control and Quantitative Precipitation Estimation Intercomparison (RQQI).
Funding Source(s)	This project will rely on existing budget allocations at the national level. The project will build on existing national observational networks and information management infrastructures. Additional funding might be needed to regularly hold technical meetings among CMA, JMA, and KMA to proceed with this project.
Overall Costs	(TBD)
Timescale	2013 – 2016
Expected Key Deliverables / Key responsible body	1. Establishment of collaborative working mechanism toward integrated surface-based remote sensing observations in the East Asia for operational monitoring and forecasting severe weather. 2. Solutions to identify issues to be solved for integration of surface-based remote sensing observations at sub-regional level and their solutions. 3. Impacts on capacities of NMHSs in severe weather monitoring and forecasting through utilization of surface-based remote sensing observations.
Main risk(s)	1. Limited exchange of observational data, for instance, due to data policies of providers. 2. Lack of sharing relevant technical documentation on exchanged data.
Website	Not to be established
Summary	This project will develop a feasible and optimal draft design of integrated

	surface-based remote sensing observations toward the sub-regional utilization in East Asia.
Date of the update	21 November 2012
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Project No. III.2

Project Title	**RA II WIGOS Project for Observing Systems Integration for Supporting Disaster Risk Reduction**
Subproject Title	**Capacity Building in Radar Techniques in the Southeast Asia**
Type	Cross-regional Implementation Project (RAs II and V)
Status	Draft Design
Overview	Developing countries in Southeast Asia share common challenges for severe weather monitoring and forecasting. In spite of many radars having been installed in the region, they are not fully utilized due to lack of their expertises in weather radar techniques. Thus, capacity building in weather radar techniques is crucial concern for the countries. Although their levels of operational usage of radar vary, they are often facing common technical challenges. In this regard, sharing their technical issues and lessons learnt among countries in the Region and developing the regional strategy on development of the radar network in the Region will enable them to tackle those challenges collaboratively with help from the WMO community in an effective and efficient manner. This project, initiated by Thailand and Malaysia, within the framework of the ASEAN Sub-Committee on Meteorology and Geophysics (SCMG), aims at establishing a collaborative mechanism within SCMG through the following steps: 1) Thailand and Malaysia, as leaders of this project, will develop their national reports toward operational rainfall estimation/forecasting based on radar data. In order to share their experiences and lessons learnt among the participating organs, and to identify technical problems to be solved and necessary technical supports for, the reports should include the following items in a well-structured format: (a) overview of the current radar systems, (b) organization (department, division, staff, and budget), (c) specification of radar systems, (d) maintenance of equipment, (e) data processing (QC, calibration, and composite technique), (f) radar products, (g) details of current technical problems associated with (a) to (f), (h) lessons learnt from the past experiences, (i) recent progress, (j) future development plans. The reports will be submitted to the 35th SCMG meeting (2013).

	2) The other ASEAN member countries will also develop their national reports in the same format as that of Thailand and Malaysia, and submit their reports to 36th SCMG meeting. Based on the submitted report, the meeting will develop a regional strategic plan on radar which identifies common technical issues and necessary actions to be taken. 3) During the period of the project, all the above Members will be requested to update their national reports and submit the latest version to a SCMG meeting every year. Thailand and Malaysia are requested to encourage the other Members to develop and keep their national reports up-to-date. The regional strategic plan is also to be updated at every SCMG meeting. *Each Member will consult with the WMO or advanced RA II Members about appropriate technical missions focused on identified technical issues in the reports such as dispatch of radar experts to recipient countries, with the VCP or other funds. On completion of such a mission, the recipient Member is requested to update its national report by including details of the outcomes of the mission. *SCMG set up a new agenda item for discussion on the progress of this project.
Aim(s)	This project aims to develop effective early warning systems building on radar data in Southeast Asia.
Benefits	Capacity in monitoring and forecasting of the severe weather using radar data will be enhanced by shared experiences and lessons among the participating organs and technical missions focused on technical issues identified in national reports and the regional strategic plan.
Key Regional Player	ASEAN-SCMG: Thailand, Malaysia
Partners/ Participants	All the ASEAN Member countries (Cambodia, Brunei Darussalam, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam)
Relationship with existing project(s)	- Radar composite map in Southeast Asia, one of the on-going projects under the Meteorological Working Group of the WMO/ESCAP Typhoon Committee, - Severe Weather Forecasting Demonstration Project (SWFDP) for Southeast Asia, - ASEAN Sub-Committee on Meteorology and Geophysics(SCMG).
Funding Source(s)	This project will rely on existing budget allocations at the national level. The project will build on existing national observational networks and information management infrastructures. Additional funding will be needed for technical cooperation for those countries by dispatching appropriate experts and/or providing training workshops.
Overall Costs	(TBD)
Timescale	2013–2016

Expected Key Deliverables / Key responsible body	- National reports in the Southeast Asia toward operational rainfall estimation/forecasting based on radar data, - Regional strategic plan on development of the radar network.
Main risk(s)	1) Failure of development of national reports by participating organs. 2) Lack of available experts. 3) Lack of funds available.
Website	Not to be established
Date of the update	21 November 2012
Contact Person 1	Dr.Somchai Baimoung Deputy Director-General/Acting Director-General Thai Meteorological Department Thailand Tel.: +66 81 989 9025 Email: somchaib@tmd.go.th
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Project No. IV

Project Title	**RA II WIGOS Project to Enhance the Availability and Quality Management Support for NMHSs in Surface, Climate and Upper-air Observations**
Type	Regional Implementation Project (RA II)
Status	Draft Design
Overview	The Japan Meteorological Agency (JMA)/World Meteorological Organization (WMO) Workshop on Quality Management in Surface, Climate and Upper-air Observations, held at Tokyo in July 2010 as part of activities of the Pilot Project to Enhance the Availability and Quality Management Support for NMHSs in Surface, Climate and Upper-air Observations (hereafter, Pilot Project), found out that primary factors adversely affecting data quality in RA II are calibration and maintenance of instruments mainly due to lack of traceability of measurements to international standards and calibration facilities. This project will build on outcomes of the workshop. It consists of the following two activities: (i) improvements of data quality of RBCN/RBSN stations; and (ii) enhancement of capabilities of RIC-Tsukuba and RIC-Beijing. All the outcomes of this project will be shared at a Portal to be established by the Coordinator. 1. Improvements of data quality at RBCN/RBSN stations (a) Monitoring Data Quality The Coordinator checks data quality of RA II stations and identifies and requests RA II Members to identify technical issues, based on the following results: • Questionnaire on the Surface, Climate, and Upper-air Observations and Quality Management in Regional Association II (Asia) (conducted in July 2010), • Questionnaire on meteorological instruments, calibration and training in Regional Association II (Asia) (conducted in January 2012), • 6-monthly monitoring reports by the Lead Centre for monitoring the quality of land surface observations in Region II. (b) Survey on status on QA/QC procedures and site managements for the network of RBCN/RBSN stations, and report the results. Based on requests from the Coordinator, the following Members

	will consider the possibility of technical support if funds are available, and share the summary of the technical missions with RA II Members: - CMA, HKO, JMA, and KMA for Southeast Asia, - IMD for South Asia, - Roshydromet for Central Asia, - Kuwait for Middle East. 2. Enhancement of RIC's Services RICs plan to implement the following action items for further enhancement of their services in capacity building and calibration during the project: (a) Organization of a training workshop to improve understanding of calibration and maintenance of meteorological instruments according to needs of RA II Members to be identified by the "Questionnaire on Meteorological Instruments, Calibration and Training in Regional Association II (Asia)", (b) Development of training materials on calibration and maintenance of instruments (to be prepared for publication as an Instruments and Methods of Observation Programme (IMOP) technical document), (c) Obtaining the International Standard ISO/IEC 17025 – General requirements for the competence of testing and calibration laboratories – certification for air pressure, temperature, and humidity, (d) Development of RIC's Websites, (e) Intercomparison between RIC-Tsukuba and RIC-Beijing, (f) Reports on status on calibration instruments for surface-based observations in RA II (to be prepared for publication as an Instruments and Methods of Observation Programme (IMOP) technical document).
Aim(s)	This project aims at improvement of data quality at RBCN/RBSN stations and enhancement of services of RA II RICs.
Benefits	RA II Members, especially those with technical issues on data quality of observations, will potentially benefit from this project.
Role/Involvement of WMO Regional Centres in RA II	Regional Instrument Centres (RICs) Lead Centre for monitoring the quality of land surface observations
Key Regional Player	JMA (Coordinator), and Members of Coordination Group Technical Mission:

	- CMA, HKO, JMA, and KMA for Southeast Asia, - IMD for South Asia, - Roshydromet for Central Asia, - Kuwait for Middle East.
Capacity development requirements	1. Workshop on maintenance, field inspection, etc. (basic level), 2. Workshop on traceability, measurement uncertainty, etc. (advanced level).
Partners/Participants	RA II Members
Funding Source(s)	This project will rely on existing budget allocations at the national level. Additional funding will be needed to dispatch experts to NMHSs in developing countries and/or invite their observational staff to RICs for trainings and calibrations of national standards.
Overall Costs	(TBD)
Timescale	2013–2016
Expected Key Deliverables / Key responsible body	1. Provision of technical support for instrument maintenance and calibration by experts from RICs. 2. Holding a RIC's training workshop for RA II Members. 3. Development of training materials (to be prepared for publication as an IMOP technical document). 4. Obtaining ISO/IEC 17025 certification. 5. Portal Website to share outcomes of this project. 6. Report on status on QC/QA procedures and site management in RA II. 7. Reports on status on meteorological instruments, calibration and training in Regional Association II.
Main risk(s)	• Lack of funding for technical missions by RICs, • Insufficient communication between the Coordinator, RICs, and RA II Members on their status on maintenance and calibration of instruments to specify needs of technical supports, • Lack of responses from RA II Members.
Website	RIC's Website/Portal on QC/QA
Summary	Improvement of data quality of RA II Members through enhancement of RIC's services and capacity
Date of the update	21 November 2012
Contact Person 1	Mr Yoshihisa NAKAMOTO Senior Coordinator for Observation Planning

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Project No. V

Project Title	**RA II WIGOS Project to Develop a Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) in Asia Node**
Type	Regional Implementation Project (RA II)
Status	Draft Design
Overview	SDS-WAS was established in 2007 to achieve comprehensive, coordinated and sustained observations and modelling capabilities of sand and dust storms in order to improve the monitoring of sand and dust storms to increase the understanding of the dust processes and to enhance dust prediction capabilities for mitigation of risks in many affected area (aviation, health impacts, etc.). The WMO SDS-WAS Region for Asia third meeting of Regional Steering Group (RSG) was held at Tsukuba, Japan in March 2012. At the meeting, it was confirmed that observation data exchange schemes should be implemented promptly in order to enhance systematic near-real-time (NRT) monitoring of sand and dust events in each country, and the following near-term implementation plan was agreed within the SDS-WAS Asia Node activity: • Each country will confirm their data policy on observation data delivery, to reach an agreement on the provision of observation data to be shared within the Node in NRT, • Regional Centre (RC: China) will provide a portal website with a function for sharing the observation data and announce it to the Node members, • At the beginning, experimental observation data sharing will be conducted in off-line basis (not NRT) for the sand/dust storms (SDS) seasons, • For the data exchange, the ad-hoc working group will propose appropriate data format and parameters, • In SDS season in the spring (from February to June) 2013, the NRT (with a goal of approximately 1-day delay) data exchange will be conducted regularly, • NRT data will be used for intercomparison of sand and dust storm forecast model to improve forecast accuracy as well as for monitoring of sand and dust storms.
Aim(s)	This project aims at mitigation of risks in many affected areas in the Asia Node countries through enhancement of systematic NRT monitoring of sand and dust storm.

Benefits	The systematic NRT monitoring of sand and dust storm will provide the Asia Node countries with useful information for sand and dust storm risk mitigation.
Role/Involvement of WMO Regional Centres in RA II	Regional Specialized Meteorological Centre with activity specialization on Atmospheric Sand and Dust Forecast (RSMC-ASDF) (TBD)
Key Regional Player	China, Japan, Republic of Korea
Partners/Participants	Countries in SDS-WAS Asia Node (China, Japan, Kazakhstan, Republic of Korea and Mongolia)
Funding Source(s)	This project will rely on existing budget allocations at the national level.
Overall Costs	(TBD)
Timescale	2013–2015
Expected Key Deliverables / Key responsible body	The systematic NRT monitoring of sand and dust storm in SDS-WAS Asia Node
Main risk(s)	Lack of resources (funds/expertise)
Website	SDS-WAS Asia Node portal
Summary	Improvement of sand and dust storms monitoring in the SDS-WAS Asia Node
Date of the update	12 November 2012
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Project No. VI

Project Title	**RA II WIGOS Project to Develop Support for NMHSs in Satellite Data, Products and Training**
Type	Regional Implementation Project (RA II)
Status	Draft Design
Overview	At its fourteenth session (December 2008), Regional Association II adopted a resolution to establish a pilot project for the development of support for National Meteorological and Hydrological Services (NMHSs) in the areas of satellite data, products and training. The Coordinating Group of the Pilot Project is composed of Japan (Co-coordinator); Republic of Korea (Co-coordinator); Bahrain; China; Hong Kong, China; India; Kyrgyzstan; Maldives; Oman; Pakistan; Russian Federation; Uzbekistan; Viet Nam and EUMETSAT (observer). The object of this project is to encourage NMHSs in RA II to make a kind of self-help effort to improve the flow of satellite-derived information by: ● Identifying the requirements of NMHSs of developing countries, regarding satellite imagery, data and products, use the results to update the RRR user requirements database and to fine tune the EGOS-IP, ● Facilitating the timely provision of satellite-related information by satellite operators themselves to users via the project web page, newsletters, etc., and ● Aligning with VLab activities to optimize assistance to NMHSs in RA II and coordinating training activities on use of satellite data/products).
Aim(s)	● To encourage NMHSs in RA II to make a kind of self-help effort to improve the flow of satellite-derived information, ● To improve the knowledge and techniques to use satellite data and products.
Benefits	NMHSs in RA II have benefited from this project to find means to access satellite data, products and training they want, and to improve the usage of satellite-derived information. This is expected to improve NMHSs' activities from nowcasting to climate and environment monitoring.
Key Regional Player	Japan, Republic of Korea and other satellite operators in RA II
Capacity development requirements	● Assistance (or support) of WMO VLab activities and other regional training activities, ● Assistance of satellite operators,

	• Liaison with EGOS-IP.
Partners/Participants	Members of the Coordination Group members: Japan (Co-coordinator); Republic of Korea (Co-coordinator); Bahrain; China; Hong Kong, China; India; Kyrgyzstan; Maldives; Oman; Pakistan; Russian Federation; Uzbekistan; Viet Nam, RA V (observer) and EUMETSAT (observer) All other RA II Members can be nominated as the Group members.
Relationship with existing project(s)	(TBD)
Funding Source(s)	Regular activities of this project rely on existing budget allocations at the national level. Additional funding will be needed to hold the Coordination Group meetings and training events regularly.
Overall Costs	(TBD)
Timescale	2012–2016
Expected Key Deliverables / Key responsible body	• Reports on requirements of NMHSs regarding satellite imagery, data and products, • Improvement on access to information on satellite data/products, • Improvement on capacity in use of satellite data/products and facilitation of training datasets and toolboxes.
Main risk(s)	Lack of resources (funds/expertise) and lack of cooperation from Members
Website	The portal site of the project is operated on the WMO web server. http://www.wmo.int/pages/prog/sat/ra2pilotproject-intro_en.php
Summary	The project will encourage NMHSs in RA II to make a kind of self-help effort to improve the flow of satellite-érelated information.
Date of the update	12 November 2012
Contact Person 1	Mr Hironobu Yokota Senior Coordinator for Meteorological Satellite Systems Satellite Program Division, Observations Department Japan Meteorological Agency (JMA) Japan Tel: +81-3201-8677 Fax: +81-3217-1036 E-mail:hyokota@met.kishou.go.jp
Contact Person 2	Dr Dohyeong KIM Senior Scientist

	National Meteorological Satellite Center Korea Meteorological Administration Republic of Korea Tel: +82-70-7850-5705 Fax: +82-43-717-0210 E-mail: dkim@kma.go.kr

RA II Pilot Project (1)

Project Name:	**Pilot Project to Develop Support for National Meteorological and Hydrological Services in Numerical Weather Prediction**
Acronym:	RAII-PP-NWP
Project Type:	Pilot
Project Status:	The Pilot Project is currently under Phase 2 of implementation.
Project Overview:	This Project is established in accordance to Resolution 6 of RA II-14 and taken forward to Phase 2 under Resolution 14 of RA II-15 to develop support for NMHSs in numerical weather prediction (NWP).
Project Aims:	Short-term: (1) To promote sharing of experience and expertise in post-processing of NWP products, modelling and data assimilation; (2) To assist recipient Members in accessing and using NWP products Long-term: (1) To assist NMHSs in Region II in development and operation of NWP model and data assimilation systems; (2) To promote exchange of knowledge and best practices between Members in different areas of NWP including data assimilation, modelling, post-processing and computational aspects
Partners/Participants:	Korea Meteorological Administration (KMA) (Co-coordinator) Hong Kong Observatory (HKO) (Co-coordinator)
Project Cost:	Not applicable.
Funding Source(s):	This project will make optimum use of the expertise of members from the Coordinating Group. Financial support will be provided through voluntary contributions.
Project Timescale:	Phase 2 of the project is expected to be completed in December 2015.
Deliverables:	(1) Training workshop for RA II members (under the framework of WMO Voluntary Cooperation Programme) on data assimilation and mesoscale ensemble forecasting (2) Survey result on users' feedback on the usefulness of the ACNF website in NWP development and applications (3) Enhancement of the web-based portal "Asian Consortium for NWP Forecasts (ACNF)" to include resources and support on post-processing of NWP and ensemble prediction system products as well as data assimilation techniques.
Project Links:	http://acnf.weather.gov.hk

Project Summary:	Completion of the project is expected to foster closer collaboration and technical exchange between NHMSs in Region II on NWP, contribute to enhancing weather services delivery, disaster risk reduction and capacity development efforts.
Date of Last Update:	26 Nov 2014
Contact Person 1: **Name:** **Organization:** **Address:** **Telephone:** **Fax:** **E-mail:** **Contact Person 2:** **Name:** **Organization:** **Address:** **Telephone:** **Fax:** **E-mail:**	Mr. Chan, Pak-wai Hong Kong Observatory 134A Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong, China +852 2926 8435 +852 2375 2645 pwchan@hko.gov.hk Mr. SHIN Hyun Cheol Korea Meteorological Administration 61 Yeoeuidaebang-ro 16-gil, Dongjak-gu Seoul 156-720, Korea +82-2-2181-0544 +82-2-2181-0908 sinhyo@korea.kr

RA II Pilot Project (2)

Project Name:	**Pilot Project on Information Sharing on Climate Services**
Acronym:	RAII-PP-ISCS
Project Type:	Pilot
Project Status:	Implemented (the dedicated website for this PP was launched in March 2014 and is kept updated.)
Project Overview:	This Project is established in accordance with Resolution 15 (RA II-15) for collecting and sharing information on climate services provided by NMHSs as well as activities related to the Global Framework for Climate Services (GFCS).
Project Aims:	Short-term: (1) To share climate services by NMHSs and information on good practices in the application of climate information in various fields, such as agriculture, health and water management. Long-term: (1) To contribute to the successful implementation of GFCS by sharing information mentioned above; (2) To support the consideration of future work to facilitate the utilization of climate information.
Partners/Participants:	Tokyo Climate Center (TCC) of the Japan Meteorological Agency (JMA) (Lead)
Project Cost:	Not applicable
Funding Source(s):	This project is based on the kind cooperation of RA II Members by providing information via questionnaires and keeping updated. The dedicated website is maintained by TCC.
Project Timescale:	The dedicated website for this PP has already been launched in March 2014 and will be kept updated.
Deliverables:	(1) Quick reference and access to climate services by NMHSs and information on good practices in the applications of climate information in various fields, such as agriculture, health and water management. http://ds.data.jma.go.jp/tcc/pilot/
Project Links:	http://ds.data.jma.go.jp/tcc/pilot/
Project Summary:	TCC plays a leading role in the implementation of the Project, and started collecting information from NMHSs via an email-based questionnaire in 2013. Based on the data received, TCC has developed a new dedicated website to support the sharing of information on climate services provided by NMHSs and on their Framework-related activities. The website was officially launched on 31 March 2014, and TCC keeps it updated by collecting

	pertinent information from NMHSs to be shared with Members. Furthermore, TCC is preparing the second questionnaire to renew information and to add more information about the utilization of climate information, aiming to contribute to the activities of GFCS.
Date of Last Update:	28 March 2015
Contact Person : **Name:** **Organization:** **Address:** **Telephone:** **Fax:** **E-mail:**	 Dr. Kazutoshi Onogi Head, Tokyo Climate Center Climate Prediction Division Global Environment and Marine Department Japan Meteorological Agency (JMA) 1-3-4 Otemachi, Chiyoda-ku, Tokyo 100-8122, Japan +81 3 3211 8406 +81 3 3211 2032 tcc@met.kishou.go.jp

RA II Pilot Project (3)

Project Name:	**Pilot Project to Develop Support for National Meteorological and Hydrological Services in the Collection and Application of Aircraft Meteorological Data Relay Data**
Acronym:	RAII-PP-AMDAR
Project Type:	Pilot
Project Status:	The Project is currently under Phase 1 of implementation.
Project Overview:	This Project is established in accordance to Resolution 16 (RA II-15) to develop support for NMHSs in the collection and application of AMDAR data.
Project Aims:	Short-term: (1) To share experience among NMHSs in setting up and operating AMDAR programme; (2) To conduct best practice workshop(s) on the setting up of AMDAR programme; (3) To share experience among NMHSs on the application of AMDAR data, including in aerodrome forecast and in forecast for the Terminal Area; (4) To assist NMHSs in Region II, especially developing country Members, in establishing their own AMDAR programme; (5) To assist NMHSs in Region II in decoding, processing and visualization of AMDAR data; Long-term: (1) To promote sharing of AMDAR data from different AMDAR programmes; (2) To promote the application of AMDAR data in Terminal Area Forecast and Service (3) To assist NMHSs in Region II in the assimilation of AMDAR data in NWP models, development of new products/applications from AMDAR data to enhance the provision of weather forecasting and warning services; (4) To identify and explore means to optimize the collection of AMDAR data;
Partners/Participants:	China Meteorological Administration (CMA) (Co-coordinator) Civil Aviation Administration of China(CAAC) (Co-coordinator) Hong Kong Observatory (HKO) (Co-coordinator)
Project Cost:	Around EUR 20,000.
Funding Source(s):	This project will make optimum use of the expertise available from the CBS Expert Team on Aircraft-based Observing Systems (ET-ABO). Financial support will be provided through voluntary contributions by CMA, CAAC and HKO.
Project Timescale:	Will be completed by December 2016

Deliverables:	(1) Survey report on RA II Members' readiness to collect and apply AMDAR data (2) Establishment of an on-line discussion forum to facilitate the sharing of experience in the collection and application of AMDAR data of RA II Members and an Internet webpage to showcase the benefit of AMDAR data in weather forecasting and warning service (3) RA II Workshop(s) on the establishment of a national AMDAR programme and application of AMDAR data to enhance weather forecasting and warning services
Project Links:	To be announced.
Project Summary:	Best practice workshop(s) and on-line support will be provided to Members of RA II to assist them in setting up its own national AMDAR programmes and in the application of AMDAR data in weather forecasting and warning service.
Date of Last Update:	26 Nov 2014
Contact Person 1: **Name:** **Organization:** **Address:** **Telephone:** **Fax:** **E-mail:** **Contact Person2:** **Name:** **Organization:** **Address:** **Telephone:** **Fax:** **E-mail:** **Contact Person3:** **Name:** **Organization:** **Address:** **Telephone:** **Fax:** **E-mail:**	Mr. Xu Jiangliang Civil Aviation Administration of China Deyuanjiuhe Plaza，Hongyan Road , Chaoyang District, Beijing,China 8610-87922183 8610-87922084 xujl@atmb.net.cn Mr. Zhang Qiang China Meteorological Administration, CMA 46 Zhongguancun Nandajie, Haidian District, Beijing, China +86 10 68407032 +86 10 62173225 zhangq@cma.gov.cn Mr. Choy Boon-leung Hong Kong Observatory 134A Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong, China +852 2926 8350 +852 2375 2645 blchoy@hko.gov.hk

RA II Pilot Project (4)

Project Name:	**Pilot Project to Sustain and Enhance the Capacity of National Meteorological and Hydrological Services (NMHSs) in the Provision of Official Weather Forecasts for Medium Range**
Acronym:	RAII-PP-MWF
Project Type:	Pilot
Project Status:	The Project is currently under Phase 1 of implementation.
Project Overview:	This Project is established in accordance to Resolution 17 (RA II-15) to develop support for NMHSs in provision of official weather forecasts for medium range.
Project Aims:	Short-term: (1) To identify the current capacity and limitations in NMHSs in providing medium range weather forecasts; (2) To identify reliable sources of NWP products to support NMHSs in providing medium range weather forecasts; (3) To explore and identify means on post-processing of NWP products to better support NMHSs in providing medium range weather forecasts; Long-term: (1) To assist NMHSs in applying NWP products and post-processing methods to generate medium range forecast, in compliance with the needs of NMHSs to be supported; (2) To identify methods and assist NMHSs in verification and validation of NWP-based weather forecasts; (3) To promote sharing of experience in NWP product application, post-processing techniques among RA II Members especially developing country Members; (4) To synergize with other related RA II Project such as "Project on the Provision of City-Specific NWP Products to Developing Countries" in supporting this pilot project.
Partners/Participants:	Hong Kong Observatory (HKO) (Co-coordinator) Korea Meteorological Administration (KMA) (Co-coordinator)
Project Cost:	Not applicable
Funding Source(s):	This project will make optimum use of the expertise on NWP model applications in Members of RA II. Funding support on the Project development will be arranged by HKO and KMA.
Project Timescale:	Will be completed by December 2016
Deliverables:	(1) Survey report on RA II Members' readiness to apply NWP products and post-processing methods in providing medium range weather forecasts; (2) Where possible, training workshop on the application of NWP

	models and post-processing methods for medium range weather forecasts; (3) On-line forum or knowledge-based portal to facilitate sharing of experience on NWP application and post-processing.
Project Links:	To be implemented.
Project Summary:	With the completion of the Project, Members of RA II will enhance their capacity in the provision of medium range weather forecasts. The NWP-based forecast products will be readily be disseminated to the public as official products through the World Weather Information Service (WWIS) website.
Date of Last Update:	20 November 2014
Contact Person 1: **Name:** **Organization:** **Address:** **Telephone:** **Fax:** **E-mail:**	 Mr. WONG Wai Kin Hong Kong Observatory 134A Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong, China +852 2926 8416 +852 2375 2645 wkwong@hko.gov.hk
Contact Person 2: **Name:** **Organization:** **Address:** **Telephone:** **Fax:** **E-mail:**	 Mr. SHIN Hyun Cheol Korea Meteorological Administration 61 Yeoeuidaebang-ro 16-gil, Dongjak-gu Seoul 156-720, Korea +82-2-2181-0544 +82-2-2181-0908 sinhyo@korea.kr

RA II Pilot Project (5)

Project Name:	**Pilot Project to Enhance the Seamless Provision of Regional Severe Weather Warnings and Advisories**
Acronym:	RAII-PP-WARNING
Project Type:	Pilot
Project Status:	The Pilot Project is currently under Phase 1 of implementation.
Project Overview:	This Project is established in accordance with Resolution 18 (RA II-15) to enhance the seamless provision of regional severe weather warnings and advisories.
Project Aims:	First phase: (1) To share experiences in data formats for tropical cyclone warnings/advisories among RA II Members; (2) To identify challenges to be solved for converting tropical cyclones warnings/advisories of RA II Members into a common data format; (3) To seek potential benefits from using a common data format for tropical cyclone warnings/advisories; Second phase after completing first phase: (1) To access the feasibility of developing a common data format for severe weather warnings/advisories by RA II Members; (2) To give the Coordinators of SWIC advice on its development of a consolidated and seamless provision of severe weather warnings/advisories through SWIC;
Partners/Participants:	Hong Kong Observatory (HKO) (Co-coordinator)
Project Cost:	Not applicable.
Funding Source(s):	This project will make optimum use of the expertise available from RA II members. Financial support will be provided through voluntary contributions by HKO.
Project Timescale:	Will be completed by December 2016
Deliverables:	(1) Survey report on data format of tropical cyclone warnings/advisories currently in use by RA II Members (2) Report on feasibility of converting RA II Members' tropical cyclone warnings/advisories into common data format
Project Links:	To be announced.
Project Summary:	With the completion of the Project, a common data format could be recommended for use by RA II Members for exchange and seamless provision of tropical cyclone warnings and advisories

Date of Last Update:	26 Nov 2014
Contact Person: **Name:** **Organization:** **Address:** **Telephone:** **Fax:** **E-mail:**	Mr. Cheng Yuen-chung Armstrong Hong Kong Observatory 134A Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong, China +852 2926 8358 +852 2311 9448 yccheng@hko.gov.hk

ANNEX V

WMO Regional Association II (Asia)
Work Plans of Working Groups

May 2015

CONTENTS

Working Group on Weather Services (WGWS)

B.L. Choy
Hong Kong Observatory

Work Plan of EG-AeM (2013-16):

Task #	Referene	Task	Key Deliverable	Activity	2013	2014	2015	2016	Responsible	Status
AeM-1	EG-AeM (ToR(i))	a) Identify regional resource persons b) Identify regional national focal points of QMS c) Conduct a survey on the current implementation status of and challenges in maintaining QMS of each member (RKO: 1.2.5)	a) List of regional resource persons b) List of regional national focal points of QMS c) Survey report on current implementation status of and challenges in maintaining QMS in RA II	a) Identify regional resource persons b) Identify regional national focal points c) Carry out a survey on the current implementation status of and challenges in maintaining QMS of each member		X	X		Co-coordinators and Theme Leader in QMS Implementation and Maintenance	A restricted scope survey had been conducted in Jun 2014 and the results presented at the EG-AeM meeting.

AeM-2	EG-AeM (ToR(i))	a) Facilitate assistance from regional resource persons through twinning, etc. b) Conduct RA II workshop(s) on implementation and/or maintenance of QMS (RKO: 1.2.5, 6.3.3)	RA II workshop(s) on implementation and/or maintenance of QMS	a) Facilitate assistance from regional resource persons thorough twinning, etc b) Hold RA II workshop(s) on implementation or maintenance or both depending on the outcome of the survey			X	X	Co-coordinators and Theme Leader in QMS Implementation and Maintenance	
AeM-3	EG-AeM (ToR(ii))	a) Identify regional resource persons b) Identify regional national focal points of Competency Assessment c) Conduct a survey on the current implementation levels and maintaining the Competency Assessment programme. (RKO: 1.2.4)	a) List of regional resource persons b) List of regional national focal points of Competency Assessment c) Survey report on current implementation levels, with identified challenges in implementation and means to overcome the challenges .	a) Identify regional resource persons b) Identify regional national focal points of Competency Assessment c) Conduct a survey on the current implementation levels and maintaining the Competency Assessment programme.		X	X		Co-coordinators, Theme Leader in Competency Assessment, Regional Training Centers and Volunteer Experts	A draft survey form had been discussed at the EG-AeM meeting.

AeM-4	EG-AeM (ToR(ii))	a) Facilitate assistance from regional resource persons through twinning, etc b) Conduct RA II Workshop on Competency Assessment of AMP (RKO 1.2.4)	Enhanced awareness of members on Competency Assessment	a) Facilitate assistance from regional resource persons through twinning, etc. b) Conduct RA II Workshop on Competency Assessment of AMP			X	X	Co-coordinators, Theme Leader in Competency Assessment, Regional Training Centers and Volunteer Experts	
AeM-5	EG-AeM (ToR(ii))	Development of guidance material (RKO 1.2.4)	Guidance material on Competency Assessment of AMP for the members of the RA II region	Identify the good practices and cases to demonstrate the implementation schedule and develop a guidance material for use by the members of the region			X	X	Co-coordinators, Theme Leader in Competency Assessment and Volunteer Experts	
AeM-6	EG-AeM (ToR(iii))	Conducting a survey on current status of MET support to ATM (RKO: 1.2.2)	Survey on current status of MET support to ATM in each member	Carry out a survey annually on the status of implementation and planning in each member		X	X	X	Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	Being arranged. To be conducted in close coordination with relevant ICAO offices
AeM-7	EG-AeM (ToR(iii))	Development of a portal web site for information sharing (RKO: 1.2.2)	Portal web-site on MET support to ATM in RA II	a) Develop a portal web-site which can be accessed via internet b) Update relevant information on MET/ATM, including best practices		X			Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	

AeM-8	EG-AeM (ToR(iii))	RAII workshop for MET/ATM improvement (RKO: 1.2.2)	RA II workshop for MET/ATM improvement	a) Hold a workshop on MET support to ATM b) Conjoint work with relevant ICAO and WMO groups, such as ICAO APAC MET/R TF, WMO ET-ISA			X		Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	
AeM-9	EG-AeM (ToR(iii))	Development of RA II guidelines on the establishment of MET support to ATM (RKO: 1.2.2)	RA II guidelines on the establishment of MET support to ATM	a) Develop RAII guidelines with reflecting outcomes of the workshop b) Consider necessary coordination with relevant ICAO and WMO groups, such as ICAO APAC MET/R TF, WMO ET-ISA				X	Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	
AeM-10	EG-AeM (ToR(iii))	Presentation at the TECO in RAII session in 2016 ・	Introduction of regional status and practices of MET support to ATM	a) Introduce examples of best practices of MET support to ATM b) Present regional status and practices of MET support to ATM				X	Theme Leader in MET support to ATM and SIGMET issuance	

AeM-11	EG-AeM (ToR(iii))	Survey on current status and issues on issuance of SIGMET information (RKO: 1.2.1)	Survey on current status of SIGMET issuance in each member	a) Carry out a survey on the status of implementation and planning in each member		X	X	X	Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	Being arranged. To be conducted in close coordination with relevant ICAO offices
AeM-12	EG-AeM (ToR(iii))	Development of a portal web site for information sharing (RKO: 1.2.1)	Portal web-site on SIGMET issuance in RA II	a) Develop a portal web-site which can be accessed via internet b) Update relevant information on SIGMET issuance, including best practices		X			Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	
AeM-13	EG-AeM (ToR(iii))	RA II workshop for SIGMET improvement (RKO: 1.2.1)	RA II workshop for SIGMET improvement	a) Hold a workshop on SIGMET issuance b) Conjoint work with relevant ICAO groups, such as ICAO APAC MET/H TF, ICAO METWSG			X		Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	To contact WMO DRA office for possibility of funding the workshop

AeM-14	EG-AeM (ToR(iii))	Development of RA II guideline for issuance of SIGMET (RKO: 1.2.1)	RA II guidelines on the SIGMET issuance	a) Develop RA II guidelines with reflecting outcomes of the workshop b) Consider necessary coordination with relevant ICAO groups, such as ICAO APAC MET/H TF, ICAO METWSG			X		Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	
AeM-15	EG-AeM (ToR(iii))	Provide input to relevant ICAO groups, e.g. ICAO APAC MET/H TF, ICAO METWSG (RKO: 1.2.1)	Input to ICAO groups for their consideration of ICAO regional/global guidelines on SIGMET issuance	a) Provide input to ICAO groups b) Consider further coordination				X	Co-ordinators and Theme Leader in MET support to ATM and SIGMET issuance	
AeM-16	EG-AeM (ToR(iii))	Presentation at the TECO in RAII session in 2016	Introduction of regional status and practices of improvement of SIGMET issuance	a) Introduce examples of best practices of improvement of SIGMET issuance b) Present regional status and practices of improvement of SIGMET issuance				X	Theme Leader in MET support to ATM and SIGMET issuance	

Work Plan of EG-OF (2013-16):

Task #	Referene	Task	Key Deliverable	Activity	2013	2014	2015	2016	Responsible	Status
OF-1	EG-OF (ToR(iv))	Monitoring of the provision of products and services by designated RA II GDPFS Centres within the flamework of the Emergency Response Activities (ERA). (RKO[5]: N/A)	a) Improve the provision measures for the products and services by designated RSMCs for the registered RA II members b) Explore of potential registration of non-registered member states.	Carry out email / fax tests to improve reachability for the registered NMHSs and organizations in RA II.	Done	Done	X	X	RSMCs in RA-II, and Theme Leader in Emergency Response Activities	On going
OF-2	EG-OF (ToR(iv))			Carry out questionaries for non-registerd RA II members.		Done	X		Theme Leader in Emergency Response Activities and WMO Secretariat	
OF-3	EG-OF (ToR(iv))	Advising on evolving requirements for ERA operational systems and servies (RKO[1]: N/A)	a) Provide better understanding of the standard products and the joint statement of ERA. b) Monitor of the user requests for ERA to improve the activity.	Provide registered RA II members and related organizations with a concise guidance for the standard products and the joint statement of ERA.		Done	X		Theme Leader in Emergency Response Activities and WMO Secretariat	
OF-4	EG-OF (ToR(iv))			Carry out user request survey using questionnaires for registered members and potential users			X	X	Theme Leader in Emergency Response Activities and WMO Secretariat	

[1] The co-coordinator of EG-OF advised that there were no pertinent items on the list related to the activities. He was looking forward to have relevant items included under RKO 3.1 of the RA II Strategic Operating Plan in future.

Work Plan of EG-PWS:

Task #	Reference	Task	Key Deliverable	Activity	2013	2014	2015	2016	Responsible	Status
PWS-1	EG-PWS (ToR(iii). (ix))	Identification of Useful Meteorological and Hydrological Products for Public Weather Service Delivery (RKO: 1.2.12, 2.1.10)	Meteorological and hydrological Products	Development of Products (2014). Identify dissemination procedure (2015). Development and maintenance of portal (2016)			X	X	Co-coordinators	
				Case studies of best practices on socio-economics benefits of service delivery by NMHS			X		Theme Leader in Socio-economic Benefits of Meteorological and Hydrological Services	
				A multilayered sustainable system for dissemination of early warnings			X	X	Theme Leader in Delivery of Warning Services	
				Identification of material for vulnerable communities education and awareness (2015), Developing the outlines of material for WMO consideration (2016)			X	X	Theme Leader in Education and Public Outreach related to PWS	

PWS-2	EG-PWS (ToR(iii))	Demonstration of socio-economic benefits (SEB) of weather, climate and water services (RKO: 1.2.12)	Assessment of SEB of weather, climate and water services	Implementation of 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	Co-coordinators, Theme Leader and Volunteer Experts in Socio-economic Benefits of Meteorological and Hydrological Services	
PWS-3	EG-PWS (ToR(vi))	Establish strategy for communication with stakeholders and regional organizations (RKO: 7.2.1)	a) Enhanced visibility of activities and priorities of NMHS; b) Enhanced communication with stakeholders and with regional organizations	Implementation of recommendations at regional level given by the guideline on communication with stakeholders and regional organizations being prepared by WMO CBS/OPAG-PWS ET/COPE			X	X	Co-coordinators, Theme Leader in Delivery of Warning Services and Volunteer Experts under EG-PWS	
PWS-4	EG-PWS (ToR(ix))	Preparation of a guideline for development and implementation of public education programme (RKO: 2.1.10)	Guideline for development and implementation of public education programme	Draft a guideline for development and implementation of public education programme			X	X	Co-coordinators, Theme Leader and Volunteer Experts in Education and Public Outreach related to PWS	
				Finalize and publish the guideline				X	Co-coordinators, Theme Leader and Volunteer Experts in Education and Public Outreach related to PWS	

PWS-5	EG-PWS (ToR(v))	Enhanced capability of public weather services (RKO: 3.1.5)	Enhancement of Members' capability in public weather services	Assistance in the SWFDP Training Workshop on Public Weather Services held in Macao, China in April 2013 for Cambodia, Lao, Thailand, Vietnam, India, Maldives, Myanmar, Sri Lanka, Pakistan, Nepal, and Bhutan	Done				Co-coordinators	
				Assistance in the SWFDP Training Workshop on Public Weather Services held in Manila, Philippines in June 2014 for Cambodia, Laos, Thailand and Vietnam		Done			Co-coordinators	
				Organization of VCP training workshop on "Effective Media Communication" in Hong Kong, China in December 2013 for Bhutan, Cambodia, China, Islamic Republic of Iran, Republic of Kazakhstan, Republic of Korea, Thailand and The United Arab Emirates	Done				Co-coordinators	

				Organization of training workshop/ seminar for RA II Members on the enhancement of public weather service delivery			X	X	All Co-coordinators, Theme Leaders, and Volunteer Experts	
PWS-6	EG-PWS (ToR(ii)&(iii))	Mainstreamed service delivery as contained in “The WMO Strategy for Service Delivery and Its Implementation Plan”	Assessment Reports of service delivery development of Members	Encouraging and assisting Members to complete questionnaire on level of service delivery and/or to prepare the assessment reports of service delivery development; Helping to manage the flow of information and the exchange of knowledge and best practices; Facilitating/developing pilot projects and twinning/mentoring activities of Members			X	X	All Co-coordinators, Theme Leaders, and Volunteer Experts	

Working Group on Climate Services (WGCS)

Akihiko Shimpo
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Work Plan of EG-CS

Task #	Reference	Task	Key Deliverable	Activity	2014	2015	2016	Responsible TL/Co-coordinator	Status
CS-01	ToR a-i	To foster, promote and advise on the implementation of the Global ramework for Climate Services (GFCS), particularly its Climate Services Information System (CSIS) and User Interface Platform (UIP) in the Region, including through pilot projects	Launching Pilot Projects in NMHS for Delivery of Climate Services	►To motivate the NMHSs for undertaking the pilot projects in developing countries	x	x	x	Kadhum/Rasul Volunteer experts in User Liaison and Applications of Climate Information and Products for Climate Risk Management and Adaptation to Climate Change	
				►To advise on using improved tools and/or software	x	x	x		
				►To guide for better composition and efficient delivery	x	x	x		
CS-02	ToR a-ii	To assist and advise the president of RA II on all matters relevant to implementation and operation of Regional Climate Centres (RCCs) in the Region	Cooperation with existing RCCs and new candidates	►To develop close coordination with existing RCCs and to maintain RA II RCC portal website	x	x	x	Zhang/Shimpo Volunteer Experts in QMS Implementation and Operation of Regional Climate Centres	
				►To encourage and advise new candidate members to establish RCCs	x	x	x		
				►To evaluate the implementation report of RCC candidates for formal designation as RCCs after completion of their demonstration phase in collaboration with CCl/CBS Expert Team on RCCs	x	x	x		
				►To submit a progress report to co-coordinators of the EG-CS by the end of every year	x	x	x		

CS-03	ToR a-iii	To promote the use of Global Producing Centre for Long-range Forecasts (GPC) and RCC products in national climate services	Linkage with Global and Regional Climate Information Producers	►To review a survey questionnaire for GPCs and RCCs conducted on the occasion of WMO workshop on long-range forecast (Nov. 2013) and to develop a list of GPC/RCC products for use of NMHSs	x			Zhang/Shimpo Volunteer Experts in QMS Implementation and Operation of Regional Climate Centres	
				►To establish a link with relevant climate products provided by GPCs/RCCs on the RAII RCC website	x	x	x		
				►To submit a progress report to co-coordinators of the EG-CS by the end of every year	x	x	x		
CS-04	ToR a-iv	To seek cooperation with relevant regional bodies and organizations on issues related to implementing user-targeted climate services for key sectors (for example, agriculture, water resources, health), including to foster and promote best practices in establishing national frameworks for climate services	Implementation of User-Targeted Climate Service	►To review and summarize activities and best practices relevant to the implementation of user-targeted climate services by NMHSs in the region	x			Kadhum/Rasul Volunteer experts in User Liaison and Applications of Climate Information and Products for Climate Risk Management and Adaptation to Climate Change	
				►To identify the key stakeholders at national scale	x				
				►To explore the nature of climate information required	x	x	x		
				►To encourage NMHSs to devise a strategic framework for information production and delivery	x	x	x		
				►To develop a feedback system for stakeholders response/confidence	x	x	x		
				►To establish user-provider interface	x	x	x		
				►To share the best practices and success stories from the Region	x				
				►To submit a progress report to co-coordinators of the EG-CS by the end of every year	x	x	x		

CS-05	ToR a-v	To identify the optimal means of meeting regional and national needs for climate information, products and services for Climate Risk Management and Adaptation	Climate Risk Management and Adaptation	►To review and summarize activities relevant to climate services for climate risk management and adaptation by NMHSs in the region	x			Kadhum/Rasul Volunteer experts in User Liaison and Applications of Climate Information and Products for Climate Risk Management and Adaptation to Climate Change	
				►To conduct Climate Risk Vulnerability Assessment	x	x	x		
				►To mitigate the risk through management practices	x	x	x		
				►To recommend adaptation strategies both structural and non-structural	x	x	x		
CS-06	ToR a-vi	To promote best practices in and to advise on implementation of new Regional Climate Outlook Forums	Implementation and Enhancement of Regional Climate Outlook Forum	►To enhance coordination with Regional Climate Outlook Forums such as FOCRAII, SASCOF, NEACOF and EASCOF	x	x	x	Zhang/Shimpo Volunteer experts in Operational Regional and National Climate Outlook Forums	
				►To develop and keep updating links to materials used at RCOFs on the RA II RCC portal website	x	x	x		
				►To promote establishment of new sub-regional Climate Outlook Forums	x	x	x		
				►To submit a progress report to co-coordinators of the EG-CS by the end of every year	x	x	x		
CS-07	ToR a-vii	To promote best practices in climate system monitoring and operational climate watch initiatives	Enhanced Climate System Monitoring and Climate Watch Systems	►To review and summarize activities relevant to climate system monitoring and climate watch by NMHSs in the region	x			Plotnitskaya/Shimpo Volunteer experts in Climate Monitoring and Climate Watch	
				►To build on successful showcases in/outside the region in producing useful climate watches	x	x	x		
				►To recommend best practices for the region in climate system monitoring and climate watches at national and regional levels		x	x		

				►To promote best practices in climate system monitoring and climate watches and to encourage RCOFs to raise the issues	x	x	x		
				►To submit a progress report to co-coordinators of the EG-CS by the end of every year	x	x	x		
CS-08	ToR a-viii	To promote regionally coordinated capacity development activities in support of climate services	Promotion of Capacity Development Activities	►To review and summarize the current capacity development activities in the region	x			All TLs/Shimpo	
				►To faciliate training events at WMO recognized institutes	x	x	x		
				►To submit a progress report to co-coordinators of the EG-CS by the end of every year	x	x	x		
CS-09	ToR a-ix	To promote and advise on research initiatives required to improve operational production of climate products	Research Initiatives on Climate Products	►To initiate research on basic climate service parameters	x			Yan/Rasul Volunteer experts in Climate Research for Development	
				►To supervise for improvement of climate products in line with user's requirements	x	x	x		
				►To associate with partner institutions for delivery of climate products	x	x	x		
				►To promote the cooperation between EG-CS and WCRP/CLIVAR regional panels and hold joint workshop with research communities on the occasion of RCOF	x	x	x		
				►To submit a progress report to co-coordinators of the EG-CS by the end of every year	x	x	x		

Work Plan of EG-AgM

Task #	Reference	Task	Key Deliverable	Activity	2014	2015	2016	Responsible	Status
AGM-01	ToR i-ii	Addressing Agrometeorological Training Needs in RA II	• Identification of actual needs in agrometeorological experts and staff as well as training needs in RA II.	• Carry out an analysis of the status of agrometeorological personnel in the countries-members RA II	+			TL in Agro-meteorological Training Needs	
				• Assess the availability of educational institutions and training programs in the field of agrometeorology and integrating it with various institutions for imparting training in the countries-members RA II	+			TL in Agro-meteorological Training Needs	
				• Assess agrometeorological training needs like availability of tools & infrastruture for onsite and virtual training and identifying resource persons /institutions for providing training in different aspects of operational agricultural meteorology in the countries-members RA II	+			TL in Agro-meteorological Training Needs	
				Preparation of effective sylabus for different training programs for coutries under RA-II region	+	+		Co-coordinators and TL in Agrometeorological Training needs.	
			• Recommendations on the establishment of Agrometeorological Advisory Services in RAII countries	• Hold an expert group meeting (EG-AgM) to discuss the establishment of Agrometeorological Advisory Services in the countries-members RA II		+		TL in Agro-meteorological Training Needs	
				• Prepare a brief report on the status of agrometeorological training in the countries-members RA II for submission to Secretariat RA II			+	Co-coordinators, TL in Agro-meteorological Training Needs	

AGM-02	ToR iii	Promotion of soil moisture monitoring methods, its usage and forecasting of soil moisture conditions in the countries-members RA II	• Assessment of current methods of soil moisture monitoring and prediction in the countries-members RA II	• Carry out an analysis on the status of standard methods of soil moisture measurement , assessment of optimum network of soil moisture stations in the countries-members RA II	+			TL in Soil Moisture Monitoring	
			• Recommendations on the improvement and enhancement of soil moisture monitoring	• Assess the utilization of alternative methods of soil moisture measurement such as satellite data//	+			TL in Soil Moisture Monitoring	
				Quantification of soil moisture data, use of soil moisture data in seasonal climate forecast models, irrigation scheduling through water balance techniques	+			TL in Soil Moisture Monitoring	
				• Determine the gaps in soil moisture monitoring in the countries-members RA II and recommendations on its improvement		+		TL in Soil Moisture Monitoring	
				• Make a report and submit to Secretariat RA II			+	Co-coordinators, TL in Soil Moisture Monitoring	

AGM-03	ToR iv	Promotion and extension of drought preparedness, management strategies and impact assessment in the Region	• Assessment of implementation of drought preparedness and management strategies at micro level and its impact assessment in the countries-members RA II	• Carry out an analysis of availability and the status of drought monitoring centers in the countries-members RA II				TL in Drought Preparedness and Management Strategies	
				• Development of recommended crop contingency planning, development of advance drought monitoring indices, undertake studies on impact of climate change / variabilty in drought climatology and development of operational models for risk management during drought in the countries-members RA II.					
			• Recommendations on the enhancement of drought monitoring and drought preparedness in the countries-members RA II	• Determine the gaps and limits in implementation of drought preparedness and management strategies	+	+			
				• Assess the availability or the status of development and implementation of national drought policies as encouraged by HMNDP Declaration in the countries-members RA II	+	+		TL in Drought Preparedness and Management Strategies	
				• Prepare recommendations on the implementation of national drought policies based on the experience of other countries and proposals of HMNDP		+		TL in Drought Preparedness and Management Strategies	
				• Prepare a brief report for submission to Secretariat RA II			+	Co-coordinators, TL in Drought Preparedness and Management Strategies	

AGM-04	ToR v	Promotion of operational use of seasonal and interannual climate forecast applications to agriculture in the Region	• Assessment of operational use of seasonal to interannual climate forecast , early warning systems and applications in agriculture in the countries-members RA II	• Carry out an analysis on the status of seasonal to interannual climate forecast and early warning systems in the countries-members RA II				TL in Seasonal Climate Forecast Applications for Agrometeorology	
			• Recommendations on the improvement of the presentation of forecasts and extreme events to agricultural community along with Decision support system	• Determine the gaps and advances in operational use of climate forecasts applications by agricultural users/ incorporation of forecast results into agricultural planning and practice	+				
				• Generation of Climate risk management tools like Climatic risk matrices, Stochastic Weather generator, Crop simulation models etc	+	+		Co-coordinators and Theme Leader in Seasonal Climate Forecast Applications for Agriculture	
				• Assess the application of GFCS results in the Region and promote the examples of successful applications on the national level		+		TL in Seasonal Climate Forecast Applications for Agrometeorology	
				• Prepare recommendations on the improvement of forecast results presentation to the users of agrometeorological information		+		TL in Seasonal Climate Forecast Applications for Agrometeorology	
				• Prepare a brief report for submission to Secretariat RA II			+	Co-coordinators, TL in Seasonal Climate Forecast Applications for Agrometeorology	

AGM-05		Socio-economic Impact of Agrometeorological Information	Identification of effective communication methods for interactions with farmers, awareness programs, economic impact analysis	• Carry out an analysis of the status of agrometeorological dissemination, awareness programs and economic impact studies in the countries-members RA II	+		+	Co-coordinators, TL in Socio-economic Impact of Agrometeorological Information	
			• Recommendations on the various awarenwness porigrams, use of ICT in agriculture information dissemination and framing guide lines to conduct economic impact assessment studies.in the countries-members RA II	Prepare guidelines for conducting awareness programs, study of economic impact assessment and recommedations for effective information dissemination.		+			
				• Prepare a brief report for submission to Secretariat RA II			+		

Working Group on Hydrological Services (WGHS)

Sung Kim
Korea Institute of Civil Engineering and Building Technology

Two different styles of work plan were presented to the members and were discussed at length. It was decided that the best approach would be to adopt the work plan used by the current CHy Advisory Working Group members.

WORKPLAN: Water Resources Assessment Hwirin Kim

Deliverable	Activities	Outputs	Resources	Milestones	Linkages
3.3.3 Implementation of Water Resources Assessment(WRA)	(a) develop and promote new approached for WRA (Priority A) - develop methodologies and tools (system) - Application of the tools (case study and manual of the developed system) (b) develop continuous monitoring tool and the regional database for the operating WRA system	- dynamic water resources assessment system(test version) - Technical report providing methodologies with case study on dynamic WRA system	- HRFCO, KICT(ROK) - Core budget - RA2 members database	-Development of methodology and tools (dynamic WRA system - test version, manual) by December 2015 - submit a draft of Technical report for development and case studies for review by September 2016 - Hold WRA workshop and training by October 2016	- CHy AWG, OPACHE - RA2 - WMO Secretariat - ROK

	(Priority B) (c) Provide guidance material for WRA and its variability linking to climate predictions (Priority A)				
3.3.4 Development of national and regional capacity building programmes and related training activities for hydrological services	Encourage and facilitate exchange and training on relevant know-how - Wrokshop for capacity building(Priority : A) -Training WRA tools for WMO members (Priority C)			- WRA workshop by October 2016 - Training course	

WORKPLAN: Water Resource Assessment **GAO GE**

	Activities	Outputs	Resources	Milestones	Linkages
3.3.2 Assessment of basin-wide water resources availability, including use of climate predictions	Prepare assessment and outlook of basin-wide availability water surplus and deficits on a national level in a regional context including the use of climate scenarios. (Priority C)		-RAII		RAII ;CHy
3.3.2 Assessment of basin-wide water resources availability, including use of climate predictions	Set up knowledge base to adapt to changes in water resources availability. (trends, outlook) (Priority A)	Report related to the case studies	- RA II -Research Documents	- collection case studies in Feb.2015 -summary the achievements in Jun. 2015 -Final report in Dec. 2015	RAII, AWG
3.3.3 Implementation of Water Resources Assessment (WRA)	Provide guidance materials for WRA linking to Climate prediction - downscaling - monthly and seasonally prediction WRA models - WRA (Priority B)	Guidance for WRA.	- China -Korea	. - Provided manual in Dec.2016	RAII CHy
3.3.4 Development of national and regional capacity building programmes and related training activities for hydrological services	Organize a training course related to the advancements of WRA : -Downscaling methods; -Data collection; -WRA methods; -WRA Information system (Priority B or C)	Training Course	WMO Regional Training Center in Nanjing	Training Course in Jun. 2016	

WORKPLAN: **Flood Forecasting** **Sergey Borshch**

Deliverables	Activities	Outputs	Resources	Milestones	Linkages
1. Improvement in hydrological warnings capability through enhanced and effective cooperation with other NMHSs (2.1.1)	(a) To prepare recommendations on the use of numerical weather prediction outputs in flood forecasts (Priority A) (b) Document approaches to ascertain the deterministic error of each ensemble element of a NWP output, for example over the previous thirty day period, using this deterministic signal to provide a weighting on the confidence of the forecasted ensemble elements (Priority A) (c) Use WMO FFI as platform [for a and b above] (Priority A) (d) Organize training course for Members (Priority C)	(a) Recommendations on the use of NWP outputs in flood forecasting systems (b) Document on the approaches to establishing the deterministic error in NWP outputs and for their use in establishing enhanced accuracy of hydrological forecasts	HMC of Russia	(a) Gathering of background material and documents on the FFI and associated activities - January 2015 Preparation of Draft Recommendations – June 2015 (b) Gathering of materials - September 2015 Preparation of Draft Report on procedures – February 2016	OPACHE's International Flood Initiative - WMO
2. Issuance of flood, flash ad urban warnings and constantly improving upon them (2.2.5)	(a) To document experiences in the use of the Flash Flood Guidance System (FFGS) in various countries by reviewing use of the Flash Flood Guidance System (FFGS) in the various countries (Priority A) (b) To investigate the potential use of FFGS in	(a) Report documenting experiences, including recommendations on approaching implementation of FFGS and its use (b) Recommended path forward for advancing the adoption of the FFGS in Central Asia.	(a) Working meeting with hydrologists and meteorologists of the Central Asia countries on use the FFGS in operative hydrological practice (b) Funding for kick-off meeting for	(a) Background material and documents on the FFGS and associated activities - April 2015 Preparation of Draft Document – June 2015 (b) Discussions with	NMHSs OPACHE's WMO Hydrological Research Center in San Diego (USA)

	Central Asian countries and facilitate its understanding by operational hydrologists in the region (Priority A) (c) To develop recommendations on use of hydrological forecasts (including probabilistic forecasts) in flood management (Priority A) (d) Develop user-oriented flood forecasting products (Priority C) (e) Conduct mission visit(s) to Members in developing countries or least developed countries (Priority C)	Conduct kick-off meeting of senior meteorologists and hydrologists within Central Asia on the FFGS project (c) Report containing recommendations on use of hydrological forecasts (including probabilistic forecasts) in flood management, based on experiences of Roshydromet	Central Asia FFGS	potential collaborating NMHSs in Central Asia - March 2015 Preparation of Draft Recommendations – March 2015 Conduct kick-off meeting - May 2015 (c) Report prepared by February 2016	
3. Improvement in capacity for water-related disaster management (hydrological extremes) [with theme on hydrological droughts] (2.1.3)	(a) Organize a workshop [or two workshops] on the provision of input and support to disaster management [on community-based flood and drought management including participation of NMHSs, emergency services and disaster management groups] (Priority B)	(a) Increased capacity for water-related disaster management	(a) Resources to conduct necessary workshop(s) through collaboration with APFM and IDMP	Training session on Integrated Flood Management dealing with development of community capacity - July 2016 Training session on Integrated Drought Management dealing with development of community capacity – November 2016	APFM IDMP NMHSs WMO

WORKPLAN: Hydrological Aspects of Drought **Dergacheva Irina**

Deliverables	Activities	Outputs	Resources	Milestones	Linkages
2.3.1. Monitoring and Warning Systems for Droughts	(a) Develop indicators for the determination of the onset of hydrological droughts. - Collection, analysis and systematization of data to identify indicators for the determination of the onset of hydrological droughts; - Identify the types of Hydrological drought is characteristic of the Asian region - Study of the conditions of formation of hydrological drought - Development of indicators to determination of the onset of hydrological droughts (Priority A)	Report on the Indicators for the determination of the onset of hydrological droughts.	WGHS RAII OPACHE Uzbekistan experts Materials for IDMP Materials for HMNDP	Preparing of the background materials to develop indicators for the determination of the onset of hydrological droughts - October 2015 Draft Report December 2015	• OPACHE's • WGHS • RAII • WMO
	(b) Prepare guidance for the development of drought monitoring networks. • Gathering information about the status of drought monitoring networks in Asian region • Identification of gaps and needs of the national hydrometeorological services to improve the drought monitoring networks • Development guidance for the development of drought monitoring networks (Priority B)	Guidance materials for the development of drought monitoring networks	WGHS RAII OPACHE Uzbekistan experts Materials for IDMP Materials for HMNDP	Background materials for the development of drought monitoring networks - March 2016 Draft Report May 2016	• OPACHE's • WGHS • RAII • WMO

3.4.1. Enhanced preparedness to predict and manage hydrological droughts and knowledge for decision making	(c) Document national guidance materials to manage droughts. • survey on current status • analysis • identify good practice (Priority C)	Guidance materials to manage droughts.	WGHS RAII OPACHE Uzbekistan experts Materials for IDMP Materials for HMNDP	Background materials to manage droughts – July 2016 Report September 2016	• OPACHE's • WGHS • RAII • WMO

WORKPLAN: Assessment of Changes in Climate Extremes, Their Impacts on Water Resources, and Translating Climate Information into Action in Water Resources Management **Mr WANG Guoqing and Mr Thuc Tran**

Deliverable	Activities	Outputs	Resources	Milestones	Linkages
• Improvement in adaptation capacity of water resources systems in a changing climate **(2.1.2)** • Assessment of basin-wide water resources availability, including use of climate predictions **(3.3.2)** • Improvement in	1) Assessment of changes in climate extremes - Data and method of climate extreme study: Data inventory, Climate index, Method – (Priority A) - Trend of some climate extremes: Temperature Extreme, Rainfall extreme, other extremes – (Priority A) - Changes in atmospheric circulation affecting climate extreme: Monsoon, typhoon and tropical depression, El Nino and Southern Oscillation – (Priority C) - Change in climate extreme affecting natural physical environment: Heat wave, cold wave, drought, extreme rainfall, flood, hoarfrost, extreme sea water level – (Priority C)	Assessment report on climate extremes for participating countries	• WGHs • WMO Secretariat • NHRI, China • CMA, China • IMHEN, Vietnam • Other countries	• Report to be submitted (May 2015) • Reports to: AWG-II • Documents as required • Workshop if needed	WGHs RA2 WMO Secretariat CHY
	2) Conduct climate projections – (Priority A) - Statistical downscaling	Climate change scenarios for		Report to be submitted	

Deliverable	Activities	Outputs	Resources	Milestones	Linkages
capacity for water-related dis • aster management (Hydrological extremes) **(2.1.3)**	- Dynamic downscaling (by Thuc Tran and Guoqing Wang)	participating countries		(May 2015)	
	3) Assessment of potential impacts of climate extremes and climate change on selected river basin water resources – (Priority A) - Temperature - Rainfall - Evapotranspiration - Flood and inundation - Drought - Water Resources (by Guoqing Wang)	Report on the impacts of climate extremes and climate change to water resources		Report to be submitted (Dec 2015)	
	4) Translating climate and climate change information into actions in water resources development and management: – (Priority A) • Case study for a selected (Chinese case study by Guoqing and Vietnam case by Tran).	Report of case study		Report to be submitted (Feb 2016)	
Development of national and regional capacity building programmes and related training activities for hydrological service **(3.3.4)**	5) Synthesize report from individual reports from participating countries in the RA II – (Priority A) (by Thuc Tran and Guoqing Wang)			Report to be submitted (May 2016)	
	6) Lesson learn and experience sharing – (Priority B)				

WORKPLAN: Improved Accuracy of Hydrometric and Sediment Observations including Space-based Technologies Noh Young Shin

Deliverables	Activities	Outputs	Resources	Milestones	Linkages
2.2.1 Reliability of quality control procedure applied on data collected from hydrological stations	a) assess the performance of hydrometric instruments and techniques of observations(Priority C)				
	b)Prepare documentation for the intercomparison of instruments and methods of observation(Priority C)				
2.2.2 Hydrometric measurements with quality and accuracy	a) Provide guidance on the use of appropriate instruments and methods of observation in diverse conditions(Priority A) - Collection of the existing technical information of IRDIMS -Collection of construction, measurement cases and management of IRDIMS(More 52sites) -Writing Technical report about construction and management by field characteristics	-Provide Technical report and guideline to design, install and operate of facilities of Integrated Real-time Discharge measurement system(IRDIMS) -Software System and manual for data QC and evaluation of IRDIMS	- Republic of Korea(ROK)	-Provide Technical report and guideline with case studies by **Dec 2016** - Collection of the existing technical information of IRDIMS by June 2015 -Collection of construction, measurement cases and management of IRDIMS(More 52sites) by Dec 2015 -Writing Technical report about construction and management by field characteristics by Dec 2016	- CHy - ROK

Deliverables	Activities	Outputs	Resources	Milestones	Linkages
	b)Improve sediment measuring techniques(Priority B) - Collection of the existing technical information -Collection of measurement case(20-50 sites) -Writing Technical report about sediment measurement method and analysis of field characteristics	- Technical report for sediment measurement	- Republic of Korea(ROK)	-Provide Technical report and guideline with case studies by **Dec 2016**	- CHy - ROK
	c)assess the accuracy and use of space-based observation (Priority C)				
2.2.3 Calculation of runoff with quality and accuracy	a) Focus on the development of rating curve - Collection of the existing technical information(Priority B) -Arrangement of theory for development rating curve -Case analysis with field condition (weir, tidal, backwater, vegetation etc.) - Writing Technical of characteristics	*-Manual for r*ating curve development method	*- Republic of Korea(ROK)*	*-Provide Technical report and guideline with case studies by **Dec 2016***	*- CHy* *- ROK*
	b)detect trends and variability in selected river basin in the region(Priority C)				
	c) provide guidelines for calculating runoff				

Deliverables	Activities	Outputs	Resources	Milestones	Linkages
	data accuracy(Priority C)				
3.3.1 Establishment of Quality Management Frameworks for Hydrology using current guidance materials for hydrology and water resource management	Encourage and facilitate exchange and training on relevant know-how(Priority C)				
3.3.4 Development of national and regional capacity building programmes and related training activities for hydrological services	Encourage and facilitate exchange and training on relevant know-how(Priority C)				

WORKPLAN: Development of the Integrated Management Platform for Sediment Disasters and Mass Movements **Tai-Hoon Kim**

Deliverables	Activities	Outputs	Resources	Milestones	Linkages
a. Issuance of landslide/debris flow warnings and consistently improving upon them	- Collect and disseminate materials for assessment of sediment disasters (Priority A) - Investigate warning technologies based on adaptive concepts (Priority B)	- Guidance materials for implementation of adaptive sediment disasters risk management tools with identification, reduction, and evacuation	- Republic of Korea (ROK) - National Disaster Management Institute (NDMI)	- Case study report for present systems for sediment disasters management by May 2015 - Analyzing models for the integrating system by Oct. 2015	- SOP 2.2.6 - RA2 - WMO Secretariat - ROK (MOSPA and NEMA, etc.)

Deliverables	Activities	Outputs	Resources	Milestones	Linkages
	- Generate sediment disasters risk map (Priority C)			- Report for adaptive sediment risk management tools by AUG. 2016	
b. Improvement in capacity for sediment disaster management (2.1.3 in OP)	- Attend seminars on sediment disasters in order to communicate and cooperate among member countries (Priority A) - Share and bring related technologies to developing countries (Priority B)	- Workshop on the provision of sharing knowledge for sediment disasters (e.g. Joint Workshop with TC DRR) - ODA projects which transplant knowhow to developing countries	- Republic of Korea (ROK) - National Disaster Management Institute (NDMI) - WMO/ESCAP Typhoon Committee, Disaster Risk Reduction (TC DRR)	- Report for feasibility survey for ODA projects by April 2016 - Joint Workshop with TC DRR on May 2015 - Strategy plan for distributing adaptive sediment risk management tools by Oct. 2016 - Submission Draft to MG for review (TBA)	- SOP 2.1.3 - RA2 - WMO Secretariat - TC DRR - ROK (MOSPA, NEMA, and KOICA, etc.)

Deliverables	Activities	Outputs	Resources	Milestones	Linkages
c. Optimization of disseminating sediment disasters related information	- Collect and analyse disseminating methodologies and related policies for sediment disasters information that alarm people not to be involved to the designated areas	- Standard Operation Plans for sediment disasters information by public broadcasting system and other media (e.g., Facebook, Twitter, etc.)	- Republic of Korea (ROK) - National Disaster Management Institute (NDMI)	- Summary report for present disseminating codes and regulations by June 2015 - Report about the effective disseminating framework by Dec. 2015	- Above SOP - RA2 - WMO Secretariat - TC DRR - ROK (MOSPA and NEMA, etc.)

CHEN Yongqing
China Meteorological Administration

Status of tasks included in work plan of EG-WIGOS

Completed- Green

In progress-blue

No action yet –red

WIGOS-01:Update of R-WIP-II

Task #	Reference	Task	Key Deliverable	Activity	2014	2015	2016	Responsible
WIGOS-01	ToR a-i	Update of R-WIP-II	A new version of R-WIP-II is developed SOP ER 4.1.7	• Carry out a survey on the comments and new project proposal	X			TL in Implementation and Updating of R-WIP(Mr Yoshiro Tanaka) and volunteer expert (Dr Sarantuya Ganjuur)
				• Draft a new version of R-WIP-II		X		TL in Implementation and Updating of R-WIP and volunteer expert (Dr Sarantuya Ganjuur)
				• Hold an expert meeting to finalize the new version of R-WIP-II (Version 2.0)		X		Co-coordinator (Mr. Chen Yongqing, Dr Jaegwang Won)
				• Submit a progress report to the co-coordinators of the EG by the end of every year	X	X	X	TL in Implementation and Updating of R-WIP

Status of tasks included in work plan of EG-WIGOS

Completed- Green

In progress-blue

No action yet –red

WIGOS-02:Monitoring of progress on Implementation of EGOS-IP in RA II

Key Deliverable	Activity	2014	2015	2016	Responsible
• A list of RA II EGOS National Focal Points, • Prioritized actions listed in the EGOS-IP, • Portal to share progress EGOS IP implementation in RA II. SOP ER 4.1.8~9	• Draft a letter and the format for national progress report on EGOS-IP to request RA II Members to appoint National Focal Points and submit EGOS National Reports annually	X			TL in Implementation of EGOS-IP(Mr Yatian Guo) and the project coordinator
	• Identify gaps and prioritize actions listed in EGOS-IP through reviewing the progress of EGOS-IP in RA II	X			TL in Implementation of EGOS-IP and the project coordinator
	• Develop a Portal to share the progress of EGOS-IP Implementation of RA II Members		X		TL in Implementation of EGOS-IP and the project coordinator
	• Keep abreast of new developments in WMO observing systems and cosponsored systems and to make recommendations for their implementation in the Region • Submit a progress report to the co-coordinators of the EG by the end of every year	X	X	X	TL in Implementation of EGOS-IP and the project coordinator

Status of tasks included in work plan of EG-WIGOS

Completed- Green

In progress-blue

No action yet –red

WIGOS-03:Development of a RA II standard and best practice portal

Key Deliverable	Activity	2014	2015	2016	Responsible
A portal on standards and best practices	• Carry out a survey on the status of national level standardization efforts • Develop a proto-type portal system (Done)	X			TL inStandard and Best Practice(Dr Seongchan Park)
SOP ER 4.1.8~9, 4.1.16	• Collect and share standard and best practices documents from RA II Members • Specify mechanisms, procedures for regular monitoring and updating of the portal	X	X		TL in Standard and Best Practice and volunteer experts (Mr Xiaolei He, Dr Hyeongyo Jeong,B. Obama,and D. Cameron)
	• Hold an experts meeting to review the portal and standard and best practices		X		TL in Standard and Best Practice
	• Establish and maintatin the portal		X	x	TL in Standard and Best Practice
	• Submit a progress report to the co-coordinators of the EG by the end of every year	X	X	X	TL in Standard and Best Practice

Status of tasks included in work plan of EG-WIGOS

Completed- Green

In progress-blue

No action yet –red

WIGOS-04:Integration of Surface-based Remote Sensing Observations in the East Asia

Key Deliverable	Activity	2014	2015	2016	Responsible
• Establishment of collaborative working mechanism toward integrated surface-based remote sensing observations in the East Asia for operational monitoring and forecasting severe weather. • Solutions to identify issues to be solved for integration of surface-based remote sensing observations at sub-regional level and their solutions. SOP ER 4.1.12, 7.1.1	• Develop a plan for offline Exchange of surface-based remote sensing datasets/products in accordance with project III.1 of R-WIP-II	X			TL in Surface-based Remote Sensing for Disaster Risk Reduction(Mr Feng Li and Dr Oleg Pokrovsky), project coordinator,and volunteer experts (Ms Ann Goryunova,Dr Wattana Kanbua)
	• Develop sub-regional radar composite maps meeting their own operational requirements	X			TL in Surface-based Remote Sensing for Disaster Risk Reduction, project coordinator,and volunteer experts
	• Develop a draft for feasible and optimal design of integration of surface-based remote sensing observations		X		TL in Surface-based Remote Sensing for Disaster Risk Reduction and project coordinator
	• Submit a progress report to the co-coordinators of the EG by the end of every year	X	X	X	TL in Surface-based Remote Sensing for Disaster Risk Reduction

Status of tasks included in work plan of EG-WIGOS

Completed- Green

In progress-blue

No action yet –red

WIGOS-05:Capacity Building in Radar Techniques in the Southeast Asia

Key Deliverable	Activity	2014	2015	2016	Responsible
• National reports in the Southeast Asia toward operational rainfall estimation/forecasting based on radar data, • Regional strategic plan on development of the radar network. SOP ER 4.1.12, 7.1.1	• **Develop and update national reports toward operational rainfall estimation/forecasting based on radar data by Thailand , Malaysia and other ASEAN members in accordance with project III.2 of R-WIP-II (Progress)**	X	X	X	TL in Surface-based Remote Sensing for Disaster Risk Reduction(Mr Feng Li and Dr Oleg Pokrovsky), project coordinator,and volunteer experts (Ms Ann Goryunova,Dr Wattana Kanbua)
	• **Develop a regional strategic plan on radar which identifies common technical issues and necessary actions to be taken.**		X		TL in Surface-based Remote Sensing for Disaster Risk Reduction, project coordinator,and volunteer experts
	• **Submit a progress report to the co-coordinators of the EG by the end of every year**	X	X	X	TL in Surface-based Remote Sensing for Disaster Risk Reduction

Status of tasks included in work plan of EG-WIGOS

Completed- Green

In progress-blue

No action yet –red

WIGOS-06: Improve Data Availability and Quality of Observations

Key Deliverable	Activity	2014	2015	2016	Responsible	Status
• Provision of technical support for instrument maintenance and calibration by experts from RICs. • Holding a RIC's training workshop for RA II Members. • Development of training materials (to be prepared for publication as an IMOP technical document). • Obtaining ISO/IEC 17025 certification. • Portal Website to share outcomes of this project. • Report on status on QC/QA procedures and site management in RA II. • Reports on status on meteorological instruments, calibration and training in Regional Association II. SOP ER 2.2.1~2, 4.1.1~6	• **Check data quality of RA II stations and identify and requests RA II Members to identify technical issues** • **Submit a staus and proposal report to the next WG meeting**	X	X		TL in Data Availability and Quality of Observations (Mr Yoshihisa Kimata),Project coordinator and volunteer experts(Mr Haihe Liang and Mr Hesam Sajdeh)	
	• **Organiz a training workshop on calibration and maintenance of meteorological instruments in RA II according to needs of the Members.**		X		TL in Data Availability and Quality of Observations,Project coordinator and volunteer experts	done
	• **Survey on status on QA/QC procedures and site managements for the network of RBCN/RBSN stations, and report the results.(survey drafted)**	X	X		TL in Data Availability and Quality of Observations,Project coordinator and volunteer experts	

Status of tasks included in work plan of EG-WIGOS

Completed- Green

In progress-blue

No action yet –red

WIGOS-06: Improve Data Availability and Quality of Observations(continue)

Key Deliverable	Activity	2014	2015	2016	Responsible
	• Organiz a training workshop to improve understanding of calibration and maintenance of meteorological instruments according to needs of RA II Members • Organiz a workshop to improve understanding of QA/QC procedures and site managements for the network of RBCN/RBSN stations according to needs of RA II Members.		X		TL in Data Availability and Quality of Observations
	• Develop training materials on calibration and maintenance of instruments	X			TL in Data Availability and Quality of Observations,Project coordinator and volunteer experts
	• Develop RIC's Websites	X			TL in Data Availability and Quality of Observations and Project coordinator
	• Carry out an intercomparison between RIC-Tsukuba and RIC-Beijing,	X			TL in Data Availability and Quality of Observations and Project coordinator
	• Submit a progress report to the co-coordinators of the EG by the end of every year	X	X		TL in Data Availability and Quality of Observations

Status of tasks included in work plan of EG-WIGOS

Completed- Green

In progress-blue

No action yet –red

WIGOS-07:Satellite Data, Products and Training

Key Deliverable	Activity	2014	2015	2016	Responsible
• Reports on requirements of NMHSs regarding satellite imagery, data and products, • Improvement on access to information on satellite data/products • Improvement on capacity in use of satellite data/products and facilitation of training datasets and toolboxes SOP ER 4.1.13	**•Survey and identify the requirements of NMHSs of developing countries, regarding satellite imagery, data and products, use the results to update the RRR user requirements database and to fine tune the EGOS-IP**		X		TL in Satellite Data, Products and Training(Mr Tomoo Ohno and Dr Dohyeong Kim), project coordinator and volunteer experts(Ms Jian Liu and Mr Ashok Sharma)
	• Facilitate the timely provision of satellite-related information by satellite operators themselves to users via the project web page, newsletters, etc.	X	X	X	TL in Satellite Data, Products and Training, project coordinator and volunteer experts
	• Optimize assistance to NMHSs in RA II and coordinating training activities on use of satellite data/products aligning with VLab activities		x	x	TL in Satellite Data, Products and Training, project coordinator and volunteer experts
	• Submit a progress report to the co-coordinators of the EG by the end of every year	X	X	X	TL in Satellite Data, Products and Training

Status of tasks included in work plan of EG-WIGOS

Completed- Green

In progress-blue

No action yet –red

WIGOS-08:Develop a Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) in Asia Node

Key Deliverable	Activity	2014	2015	2016	Responsible
The systematic NRT monitoring of sand and dust storm in SDS-WAS Asia Node SOP ER 4.1.5~6	• **Develop a plan for the data exchange of the Sand and Dust Storm data**				Project coordinator
	• **Establish an ad-hoc working group for parameters and data format exchanged**	X			
	• **Develop a portal with a function for sharing the observation data and announce it to the Node members**		X		Project coordinator
	• **Submit a progress report to the co-coordinators of the EG by the end of every year**	X	X	X	Project coordinator

Status of tasks included in work plan of EG-WIGOS

Completed- Green

In progress-blue

No action yet –red

- **WIGOS-09**:Update of the Regional Basic Synoptic Network(RBSN) and Regional Basic Climatological Network（RBCN）

Key Deliverable	Activity	2014	2015	2016	Responsible
Update version of RBSN and RBCN SOP ER 4.1.5~6, 10~11, 14	• **Monitor the changes and proposals to RBSN and RBCN by members** • **Assess and continuously monitor regional observational requirements, identify regional gaps and identify capacity development projects within the Region to address those gaps.**	X	X	X	TL in Observational Requirements and Regional Network(Mr D. K. Malik and Mr Abdulqaleq Ali Ali) and volunteer experts (Ms Jianxia Guo,Mr Jiankai Wang,Mr Ibrahim N. Lawend,Dr Andrey Dubovetskiy)
	• **Develop an update version of RBSN and RBCN to the WG on WIGOS/WIS meeting**		X		TL in Observational Requirements and Regional Network and volunteer experts
	• **Submit a progress report to the co-coordinators of the EG by the end of every year**	X	X	X	TL in Observational Requirements and Regional Network

Status of tasks included in work plan of EG-WIS

Completed- Green

In progress-blue

No action yet –red

WIS-01:Development of RA-II WIS Implementation Plan (RA-II WIS-IP)

Key Deliverable	Activity	2014	2015	2016	Responsible	Status
RA-II WIS-IP	• Summarize the previous working progress and outcome of RA-II WIS-IP • Establish the Task Team for reorganizing and finalizing the RA-II WIS-IP • Reorganize and compile the draft of RA-II WIS-IP • Collect comments for the draft of RA-II WIS-IP from RAII members and WMO Secretariat • Finalize and submit the first version of RA-II WIS-IP to Chair of WIGOS/WIS and WMO secretariat				Co-coordinators	The RA-II WIS-IP has been submitted and then approved by the president of RA II.
	• Hold an experts meeting to review the first version of RA-II WIS-IP and discuss the progress made in the implementation and operation of WIS in the Region			X	Co-coordinators, TLs and volunteer experts of ET-WIS	
	• Keep develop, update and review RA-II WIS-IP, submit revised version to the president of RA-II and the RA II office in WMO Secretariat every year	X	X	X	Co-coordinators	

Status of tasks included in work plan of EG-WIS

Completed- Green

In progress-blue

No action yet –red

WIS-02:Constant review the Regional Meteorological Telecommunication Network (RMTN) and its implementation

Key Deliverable	Activity	2014	2015	2016	Responsible
Status and Plans of RMTN in RA II	• Collect the status and plans of implementation of the RMTN from RA II members • Analyze the feedback and make recommendations • Draft the status report of RMTN in RA II annually	X	X	X	TL and volunteer experts in WIS-GTS operations, including Early Warning

Status of tasks included in work plan of EG-WIS

Completed- Green

In progress-blue

No action yet –red

WIS-03:Constant review the status report of Data Communication Techniques and structure in RA-II

Key Deliverable	Activity	2014	2015	2016	Responsible
Status report of Data Communication Techniques and structure in RA-II annually	• Keep review the organizational and technical aspects of the WIS data communication structure, and especially of the GTS in RA-II • Formulate recommendations for the further development and upgrading of the RMTN and of the regional data communication structure of WIS • Draft the status report of Data Communication Techniques and structure in RA-II annually	X	X	X	TL and volunteer experts in Data Communication Techniques and Structure
Amendments of Volume II of the manual on the GTS in RA-II	• Keep review, develop and update the Volume-II of the Manual on the GTS • Consider harmonization with Manual on WIS • Make draft recommendation of the amendments			X	TL and volunteer experts in Data Communication Techniques and Structure

Status of tasks included in work plan of EG-WIS

Completed- Green

In progress-blue

No action yet –red

WIS-04:Constant review the status of inter-programme data representation matters and the status of implementation of the WIS DAR metadata catalogue

Key Deliverable	Activity	2014	2015	2016	Responsible
Status Report of Data Representation and Metadata in RA II	• Collect the status and progress on the inter-programme data representation matters, including migration to Table Driven Code Forms and regional codes, and the WIS DAR metadata catalogue and migration from WMO Catalogue of Meteorological Bulletins (Volume C1) to DAR metadata from RA II members • Analyze the feedback and make recommendations • Draft the status report of Data Representation and Metadata in RA II annually	X	X	X	TL and volunteer experts in Data Representation and Metadata

Status of tasks included in work plan of EG-WIS

Completed- Green

In progress-blue

No action yet –red

WIS-05:Constant review WIS service and WIS monitoring developing activities and implementation in RA II

Key Deliverable	Activity	2014	2015	2016	Responsible
Status Report of the implementation of WIS service and WIS monitoring in RA II	• Support the regional activity for the WIS Application Pilot Project in Regions II and V including promoting further participation of National Meteorological and Hydrological Services in the Region • Review WIS monitoring developing activities and implementation in the Region, including the real-time and non real-time WWW monitoring activities pertaining to the GTS in the Region • Review the definition of regional requirements for data exchange, management and access of WMO programmes • Draft the status report of the implementation of WIS service and WIS monitoring in RA II annually	X	X	X	TL and volunteer experts in WIS-GTS operations, including Early Warning

Status of tasks included in work plan of EG-WIS

Completed- Green

In progress-blue

No action yet –red

WIS-06:Constant review the status and progress on the Climate Data Management/Data Rescue in RA II

Key Deliverable	Activity	2014	2015	2016	Responsible	Status
Status Report of the Climate Data Management/Data Rescue in RA II	• Collect the status and plans of implementing Modern Climate Data Management Systems (CDMSs) and the progress in interfacing CDMS with WIS from RA II members • Collect the plans and progress on national, multinational and regional Data Rescue (DARE) projects from RA II members • Analyze the feedback • Draft the status report of the Climate Data Management/Data Rescue in RA II annually	X	X	X	TL and volunteer experts in Climate Data Management/Data Rescue	

Status of tasks included in work plan of EG-WIS

Completed- Green

In progress-blue

No action yet –red

WIS-07:Constant review the IGDDS Implementation Plan and advise Region Members on regional activities

Key Deliverable	Activity	2014	2015	2016	Responsible
Status Report on IGDDS in RA II	• Review the IGDDS Implementation Plan and advise Region Members on regional activities that will contribute to enhance access to satellite data, products and services • Collect the status of requirements for access to satellite data, products and services from RA II members • Analyze the feedback and coordinate with other Regional IGDDS Rapporteurs on relevant IGDDS activities • Draft the Status Report on IGDDS in RA II annually	X	X	X	TL and volunteer experts in IGDDS

ANNEX VI

LIST OF THE RA II REGIONAL ACTIVITIES (2012-2015)

Years / Regional Events	2012	2013	2014	2015
Session of the Association	13-19 Dec Doha, Qatar (RA II-15)			
Regional Conference on the Management of Meteorological and Hydrological Services (RECO)			2-4 Dec Doha, Qatar	
Regional Seminar	11-12 Dec Doha, Qatar			
Meeting of Management Group (MG)	29 Feb-2 Mar Doha (MG-4) 29-30 Jun Geneva (MG-5) 28 Oct Geneva (MG-6)	12 May Geneva (MG-7)	18 Jun Geneva (MG-8) 4 Dec Doha, Qatar (Prep. MG)	27 May Geneva (MG-9)
RA II WG-ICT-TT Chairs' Meeting			27-28 May Doha, Qatar	
Working Group on Weather Services (WGWS)			10-12 Nov HK, China (EG-AeM)	
Working Group on Climate Services (WGCS)				
Working Group on Hydrological Services (WGHS)			30 Sep-2 Oct Seoul, ROK	14-16 Apr Seoul, ROK
Working Group on WMO Integrated Global Observing System (WIGOS) and WMO Information System (WIS) (WG-WIGOS/WIS)				13-15 Oct Indonesia (Joint RA II/V WIGOS Workshop)
Session of Implementation Coordination Team on Service Delivery (ICT-SD)				
Session of Implementation Coordination Team on Disaster Risk Reduction (ICT-DRR)				
Regional LDC Workshop in Asia			9-11 Sep Thimphu, Bhutan	

Budget Allocation approved by Cg-XVI (ref. WMO Operating Plan 2012-2015)

RA II Technical Conference	2014	CHF 79,886
RA II Management Group Meeting	2012	CHF 25,590
Working Group sessions of RA II	2013-2015	CHF 45,270
Assistance to President of RA II	2012-2015	CHF 16,166
Regional LDC Workshop for RA II and RA V	2012	CHF 20,472

ANNEX VII

LIST OF PARTICIPANTS

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