

Survey Report

Institutional Arrangements, Challenges and Priorities in Regional Association II (Asia)



World Meteorological Organization

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Executive Summary

The Members of WMO Regional Association II (RA II) have been surveyed in order to gather information on the institutional arrangements for the national provision of hydrometeorological services and to identify the most important challenges and priorities of Members and of the Regional Association as a whole. The survey was prepared by the RA II Task Team on Strategic and Operating Planning (TT-SOP) which reports to the RA II Management Group with the assistance of WMO Secretariat. The data obtained from the survey will help the RA II Management Group and WMO Secretariat prepare baseline information and background material, including the identification of regional priorities, in order to inform and support evidence-based strategic planning discussions at the forthcoming sixth session of Regional Conference, which is scheduled to be held from 2 to 4 December 2014.

The Survey was conducted on-line using the SurveyMonkey platform during the period from July to October 2014. Thirty three responses out of possible 35 Members were received.

Institutional Arrangements

All National Meteorological and Hydrological Services (NMHSs) in RA II are the government entities, work under a variety of different parent organizations, including ministry, council of ministers and state council, with different degrees of autonomy. Four fifth of Members are functioning under one or more legislative acts or orders of decree; and one fifth of Members are functioning without legal meteorological authorities or on an ad hoc basis.

Management and Organization

Most NMHSs in RA II are government or state-owned agencies operating within national government policies and frameworks with, in most cases, little scope for commercial activities. All NMHSs have development/strategic plans in place covering the next 3-5 years. Enhancing the monitoring infrastructure, improving operational forecast and warning services, strengthened IT capability and enhanced climate services (implementation of the GFCS); and training, education and capacity building of staff are the most commonly identified priorities of these plans.

Operations and Services

NMHSs in RA II deliver a broad range of services across many sectors: public weather forecasts and warning services are provided by all Members; climate, agro-meteorological and aviation services are provided by most of the Members; marine services and hydrological services are also commonly provided by the Members; and only a small number of NMHSs provided air/water quality and earthquake/seismological services, tailored services to specific users, tsunami and volcano services. Since this survey only focused on hydrological services

provided by NMHSs, it might not represent the overall status of hydrometeorological services at the national level.

The primary challenges in delivering the above services are insufficiency of staffing resources and shortcomings in the underpinning climate services and Numerical Weather Prediction (NWP) modeling.

Challenges and Priorities

The challenges in the Region identified by the survey include lack of qualified personnel, NWP modeling capacity, and the adequacy of climate services and early warning services for disaster risk reduction (DRR), and improved visibility towards the decision makers.

Serious	Moderate to Serious
<ul style="list-style-type: none"> • Adequacy of qualified personnel in some areas • Adequacy of NWP modeling capacity • Budget - anticipated cuts 	<ul style="list-style-type: none"> • Adequacy of climate services • Improved visibility towards the decision makers • Adequacy of EWS and services for DRR
Moderate	Slight
<ul style="list-style-type: none"> • Anticipated staff cuts • Data policies • Relationship with private sector 	<ul style="list-style-type: none"> • Introduction/maintenance of QMS • Adequacy of telecommunication facilities and capacity • Adequacy of the existing observing systems

The survey identified six regional priority areas for continued attention:

1. Implementation WIGOS - WIS including GISC
2. Capacity development
3. Strengthening of Climate Services including GFCS
4. Enhancement of Services – PWS, hydrology and Aviation
5. Disaster Risk Reduction/Early Warning System (DRR/EWS)
6. Improvement of Quality Management System (QMS)

Suggestions for RA II Activities

Financial and staffing constraints are one of the main challenges that limit the ability of many Members to participate in regional activities and working bodies. Language problem do exist in some Member countries.

Members look to support from other Members in the form of joint/twinning projects, capacity building, technical support on QMS and developing and/or strengthening regulation and SOP, and infrastructure support. Members also look to the WMO Secretariat for coordination support for participation in regional events, and sharing information on regional activities and

facilitating support in coordination of Voluntary Contribution Programme (VCP) mobilization for Least Developed Countries (LDCs).

1 Introduction

The Members of WMO Regional Association II (Asia) have been surveyed in order to gather information on the institutional arrangements for the national provision of hydro-meteorological services and to identify the most important challenges and priorities of Members and of the Regional Association II (RA II) as a whole. The survey was prepared by the RA II Task Team on Strategic and Operating Planning (TT-SOP) which reports to the RA II Management Group with the assistance of WMO Secretariat. The data obtained from the survey will help the RA II Management Group and WMO Secretariat prepare baseline information and background material, including the identification of regional priorities, in order to inform and support evidence-based strategic planning discussions at the forthcoming sixth session of Regional Conference in RA II.

The survey was conducted on-line using the SurveyMonkey platform during the period from July to October 2014. Thirty three responses out of possible 35 Members were received³. Analysis result presented in this report was based on the responses obtained in this survey.

1.1 Composition of RA II

RA II is composed of 35 Member countries and territories in Asia. Based on geographic location, the Members of RA II can be assigned to five sub-regions: Central Asia (6 Members), East Asia (7 Members), South-East (SE) Asia (5 Members), South Asia (8 Members), and West Asia (9 Members). According to the WMO Membership record, Bhutan is the most recent Member country in RA II to take WMO membership. Details are given in Figure 1.1 and Table 1.1.

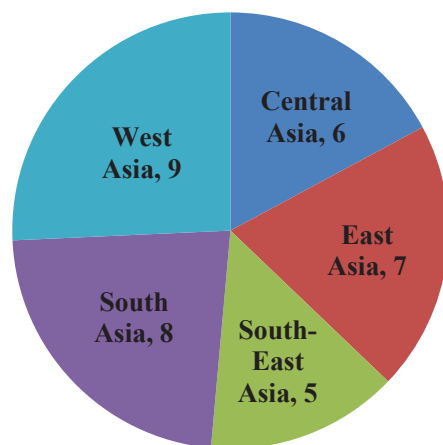


Figure 1.1: Sub-regional group of Members

³The following Members responded to the Survey: Afghanistan; Bahrain; Bangladesh; Cambodia; China; DPR Korea; Hong Kong, China; India; Iran, Islamic Republic of; Iraq; Japan; Kazakhstan; Kuwait; Kyrgyz Republic; Lao PDR; Macao, China; Maldives; Mongolia; Myanmar; Nepal; Oman; Pakistan; Qatar; Republic of Korea; Russian Federation; Saudi Arabia; Sri Lanka; Tajikistan; Thailand; United Arab Emirates; Uzbekistan; Viet Nam; and Yemen

Table 1.1: Regional Members by Sub-region and WMO accession date

Sub-region	Member	WMO Accession Date <i>(Source: WMO, 2014)</i>
Central Asia	Kazakhstan	5-May-1993
	Kyrgyz Republic	20-Jul-1994
	Russian Federation	2-Apr-1948
	Tajikistan	10-Aug-1993
	Turkmenistan	4-Dec-1992
	Uzbekistan	23-Dec-1992
East Asia	China	***
	Democratic People's Republic of Korea	27-May-1975
	Hong Kong, China	14-Dec-1948
	Japan	11-Aug-1953
	Macao, China	24-Jan-1996
	Mongolia	4-Apr-1963
	Republic of Korea	15-Feb-1956
South-East Asia	Cambodia	8-Nov-1955
	Lao People's Democratic Republic	1-Jun-1955
	Myanmar	19-Aug-1949
	Thailand	11-Jul-1949
	Viet Nam	8-Jul-1975
South Asia	Afghanistan	11-Sep-1956
	Bangladesh	24-Aug-1973
	Bhutan	11-Feb-2003
	India	27-Apr-1949
	Maldives	1-Jun-1978
	Nepal	12-Aug-1966
	Pakistan	11-Apr-1950
	Sri Lanka	23-May-1951
West Asia	Bahrain	21-Apr-1980
	Iran, Islamic Republic of	30-Sep-1959
	Iraq	21-Feb-1950
	Kuwait	1-Dec-1962
	Oman	3-Jan-1975
	Qatar	4-Apr-1975
	Saudi Arabia	26-Feb-1959
	United Arab Emirates	17-Dec-1986
	Yemen	8-July-1971
<p>*** for China: The following statement is given at the request of the Government of the People's Republic of China: “On 11 October 1947, the representative of the Chinese Government signed the Convention of the World Meteorological Organization. After the founding of the People's Republic of China, her rightful seat in WMO was usurped by the Chiang Kai-shek clique, whose ‘ratification’ of the Convention of the World Meteorological Organization on 2 March 1951 was illegal and null and void. The rightful seat of the People's Republic of China was restored to her on 25 February 1972.”</p>		

1.2 Organization of Survey Questionnaire

The Survey questionnaire was designed to collect information from RA II Members under five broad headings: 1) Institutional Arrangements; 2) Management and Organization; 3) Operations and Services; 4) Challenges and Priorities and 5) Suggestions for the RA II Activities. For ease and consistency of response, the majority of questions were ‘closed’, with respondents choosing from one or more defined answers. However, in instances where more subjective or narrative information was required, the questions were left ‘open’. The Survey structure and questions were strongly based on a similar survey conducted by Regional Association V (South-West Pacific) and Regional Association VI (Europe) to allow for some comparisons between regional associations.

The Survey questionnaire is available at WMO, RAP website:

<http://www.wmo.int/pages/prog/dra/rap.php>

2 Institutional Arrangements

The institutional set-up of NMHSs is governed by legislative frameworks, mandates and scope. The enactment of legislation and government priorities define the functional responsibilities of the NMHS and its position within the Government. The purpose of this section is to present basic information about the NMHSs of RA II Members, including the position of the NMHS within Government, as well as the role and mandate of the NMHS in the provision of services.

2.1 Title and Parent Organization

In RA II, NMHSs operate under various titles and functional definitions, as described in Table 2.1 below.

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

Sub-region	Member	Title of NMHSs in local languages and English
Central Asia	Kazakhstan	Қазақстан гидрометқызметінің National Hydrometeorological Service
	Kyrgyz Republic	Agency on hydrometeorology
	Russian Federation	Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet)
	Tajikistan	Государственное Учреждение по гидрометеорологии Республики Таджикистан State Administration for Hydrometeorology of the Republic of Tajikistan
	Uzbekistan	Centre of Hydrometeorological Service of the Republic of Uzbekistan (Uzhydromet)
East Asia	China	中国气象局 China Meteorological Administration
	DPR Korea	기상수문국 State Hydrometeorological Administration (SHMA)
	Hong Kong, China	香港天文台 Hong Kong Observatory
	Japan	気象庁 Japan Meteorological Agency
	Macao, China	Direcção dos Serviços Meteorológicos e Geofísicos (SMG) Macao Meteorological and Geophysical Bureau (SMG)
	Mongolia	National Agency for Meteorology and Environment Monitoring of Mongolia
	Republic of Korea	기상청 Korea Meteorological Administration
South-East Asia	Cambodia	Department of Meteorology
	Lao PDR	ກົມອຸຕຸນິຍົມແລະອຸທົກກະສາດ Department of Meteorology and Hydrology (DMH), Lao PDR
	Myanmar	Department of Meteorology and Hydrology
	Thailand	กรมอุตุนิยมวิทยา Thai Meteorological Department
	Viet Nam	Trung tâm Khí tượng Thủy văn quốc gia National Hydro-Meteorological Service of Viet Nam

Sub-region	Member	Title of NMHSs in local languages and English
South Asia	Afghanistan	Afghanistan Meteorological Authority (AMA)
	Bangladesh	Bangladesh Meteorological Department
	India	भारतमौसमविज्ञानविभाग India Meteorological Department
	Maldives	Maldives Meteorological Service
	Nepal	जलतथामौसमबिज्ञानविभाग Department of Hydrology and Meteorology
	Pakistan	MahkmaMosmiat Pakistan Meteorological Department
	Sri Lanka	KaalagunaVidyaDeparthamenthuva. Department of Meteorology
West Asia	Bahrain	Bahrain Meteorological Services
	Iran	سازمان هواشناسی جمهوری اسلامی ایران Islamic Republic of Iran Meteorological Organization (IRIMO)
	Iraq	الهيئة العامة للأنواء الجوية و الرصد الزلزالي Iraqi Meteorological Organization and Seismology
	Kuwait	إدارة الأرصاد الجوية Meteorological Department
	Oman	المديرية العامة للأرصاد الجوية Director General of Meteorology
	Qatar	Qatar Meteorology Department
	Saudi Arabia	الرئاسة العامة للأرصاد وحماية البيئة Presidency of Meteorology and Environment
	UAE	المركز الوطني للأرصاد الجوية والزلازل National Center of Meteorology and Seismology
	Yemen	الهيئة العامة للطيران المدني والأرصاد - قطاع الأرصاد الجوية Civil Aviation&Meteorology Authority

Table 2.2 presents the parent organization and its legal status under which NMHS is currently operating. It is revealed from survey that almost all NMHSs in RA II are functioning as government entities with legal status of either specialized government department or state enterprise/agency. NMHSs in RA II are running under different ministries whilst in Uzbekistan and Saudi Arabia under council of ministers and in China under state council.

Table 2.2: Parent organization and legal status of NMHS

Sub-region	Member	Title of the Parent Organization	Legal Status of the NMHS
Central Asia	Kazakhstan	Ministry of Energy of the Republic of Kazakhstan	State owned Enterprise
	Kyrgyz Republic	Ministry of emergency situations of the Kyrgyz Republic	Agency
	Russian Federation	Ministry Of Natural Resources	National Federal Service
	Tajikistan	Committee on Environmental Protection under the Government of the Republic of Tajikistan	State owned enterprise

Sub-region	Member	Title of the Parent Organization	Legal Status of the NMHS
	Uzbekistan	Cabinet of Ministers	State owned enterprise
East Asia	China	State Council	Agency
	DPR Korea	State Hydrometeorological Administration	Ministry
	Hong Kong, China	Commerce and Economic Development Bureau	Department
	Japan	Ministry	Agency
	Macao, China	Secretaria para os Transportes e Obras Públicas	Department
	Mongolia	National Agency for Meteorology and Environment Monitoring of Mongolia	Agency
	Republic of Korea	Ministry of Environment	Administration
South-East Asia	Cambodia	Ministry of Water Resources and Meteorology	Department
	Lao PDR	Ministry of Natural Resources and Environment	Department
	Myanmar	Ministry of Transport	Department
	Thailand	Ministry of Information and Communication Technology	Department
	Viet Nam	Ministry of Natural Resources and Environment	Agency
South Asia	Afghanistan	Ministry of Transport and Civil Aviation	Authority
	Bangladesh	Ministry of Defense	Department
	India	Ministry of Earth Sciences	Department
	Maldives	Ministry of Environment and Energy	Department
	Nepal	Ministry of Science, Technology and Environment	Department
	Pakistan	Aviation Division	Department
	Sri Lanka	Ministry of Disaster Management	Department
West Asia	Bahrain	Ministry of Transportation	State owned enterprise
	Iran	Ministry of Roads & Urban Development	State owned organization
	Iraq	Ministry of Transportation	State owned enterprise
	Kuwait	-	Department
	Oman	Public Authority for Civil Aviation	Department
	Qatar	Civil Aviation Authority	Department
	Saudi Arabia	Council of Ministers	Presidency
	UAE	Ministry of Presidential affairs	State Owned Enterprise
	Yemen	Ministry of transportation	Sector (State Owned Enterprise)

2.2 Functional Scope

NMHSs possess a range of functions and often provide services across a number of areas in addition to meteorology, including hydrology, oceanography and seismology. Responsibility for operational hydrology lies with agencies other than the NMHS in 17 of the 33 Members that responded to the Survey, and NMHSs in 16 Members having responsibility for operational hydrology. Figure 2.1 presents the sub-regional distribution of operational hydrological responsibility. All five Members of Central Asia are responsible for operational hydrological services whilst all nine Members of West Asia are not.

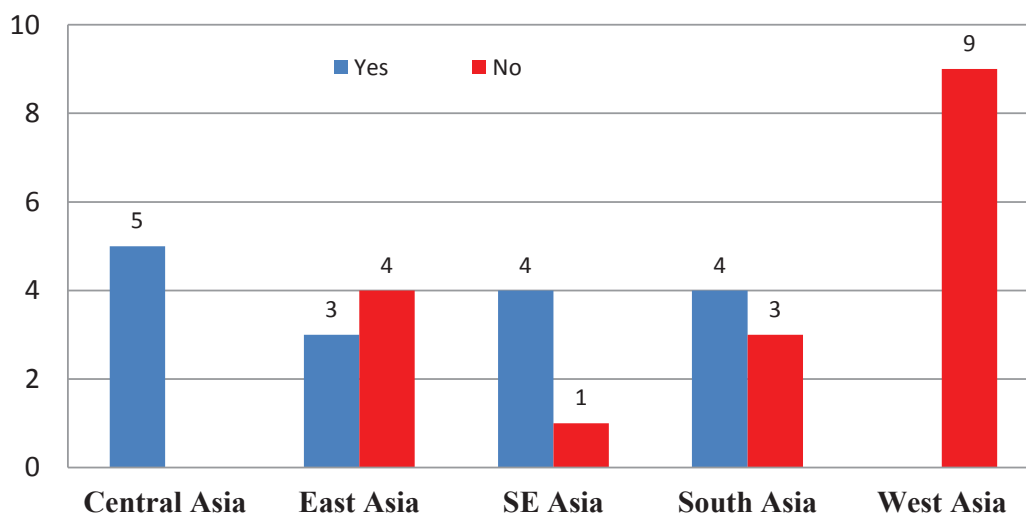


Figure 2.1: NMHS responsible for hydrological services

Institutional arrangements for the provision of hydrological services are summarized in Table 2.3. Thailand and Pakistan share a responsibility of operational hydrological services among other government agencies or bureau, and Bahrain does not have any agency responsible for operational hydrology.

Table 2.3: Institutions responsible for hydrological services

Sub-region	Member	Organization Responsible for Hydrology
Central Asia	Kazakhstan	Ministry of environment and water resources
	Kyrgyz Republic	Agency on hydrometeorology
	Russian Federation	Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet)
	Tajikistan	State Administration for Hydrometeorology
	Uzbekistan	Centre of Hydrometeorological Service
East Asia	China	Ministry of Water Resources
	DPR Korea	State Hydrometeorological Administration(SHMA)
	Hong Kong, China	Hong Kong Observatory
	Japan	Water and Disaster Management Bureau, Ministry of Land, Infrastructure, Transport and Tourism (MLIT)

Sub-region	Member	Organization Responsible for Hydrology
	Macao, China	Marine and Water Bureau
	Mongolia	National Agency for Meteorology and Environment Monitoring of Mongolia
	Republic of Korea	Ministry of Land, Infrastructure and Transport
South-East Asia	Cambodia	Department of Hydrology and River Works
	Lao PDR	Department of Meteorology and Hydrology (DMH), Lao PDR
	Myanmar	Department of Meteorology and Hydrology
	Thailand	Thailand has some of governmental agencies responsible on operational hydrology, water resources management and assessment activities, i.e. Thai Meteorological Department (TMD), Royal Irrigation Department (RID), Department of Water resources (DWR), Electricity Generating Authority of Thailand (EGAT), etc. Hydrological Adviser to PR of Thailand is from the Thai Meteorological Department
	Viet Nam	National Hydro-Meteorological Service of Viet Nam
South Asia	Afghanistan	Afghanistan Meteorological Authority (AMA)
	Bangladesh	Bangladesh Water Development Board
	India	Central Water Commission
	Maldives	Maldives Meteorological Service
	Nepal	Department of Hydrology and Meteorology
	Pakistan	Hydrological Adviser is designated from Federal Flood Commission (FFC)
	Sri Lanka	Department of Irrigation
West Asia	Bahrain	does not exist
	Iran	Ministry of energy in water affair
	Iraq	Ministry of water resources
	Kuwait	Ministry of Electricity & Water
	Oman	Ministry of Regional Municipalities & Water Resources
	Qatar	Shared among other Ministries
	Saudi Arabia	Saudi Geological Survey SGS
	UAE	-
	Yemen	National Water Resource Authority (NWRA)

With respect to aeronautical meteorological services, the survey sought information on each NMHS's role as the Meteorological Authority and Meteorological Service Provider and their compliance with ICAO Annex 3 protocols.

Twenty nine respondents identified the NMHS as both the Meteorological Authority and the Service Provider for aviation sector. Two respondents (Kazakhstan and China) identified the NMHS as not the Meteorological Authority but partially involved in the Met Services for aviation. One respondent (Tajikistan) identified the NMHS as Met service provider for aviation but not Meteorological Authority, and one respondent from South-East Asia (Viet Nam) identified the NMHS services as neither meteorological authority nor service provider for aviation sector (see Figure 2.2).

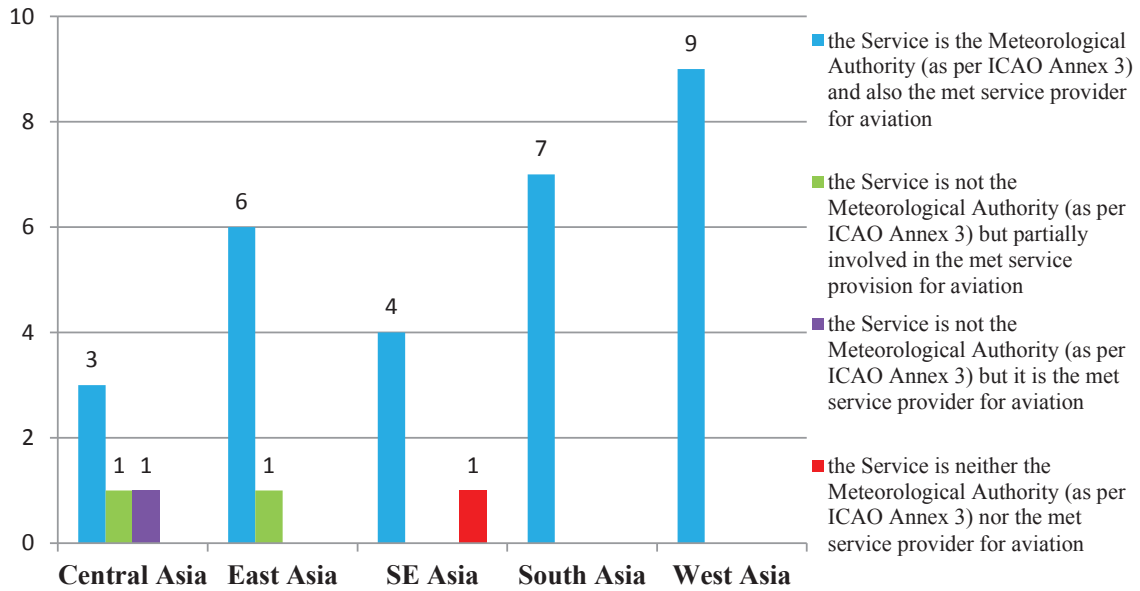


Figure 2.2: Provision of aeronautical meteorological services

2.3 Legislative Arrangements

Legal instruments for the establishment and function of the NMHS exist in 27 Members. The type of legislative instruments varies, and includes Acts of Parliament, laws, statutory instruments and decrees. Twelve Members operate under a Government Act, and fifteen under a decree (see Figure 2.3). Seven Members operate without either. Two Members (Lao PDR and Yemen) 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. The majority of existing legislation focuses on the meteorological and hydrological duties and responsibilities of the NMHS.

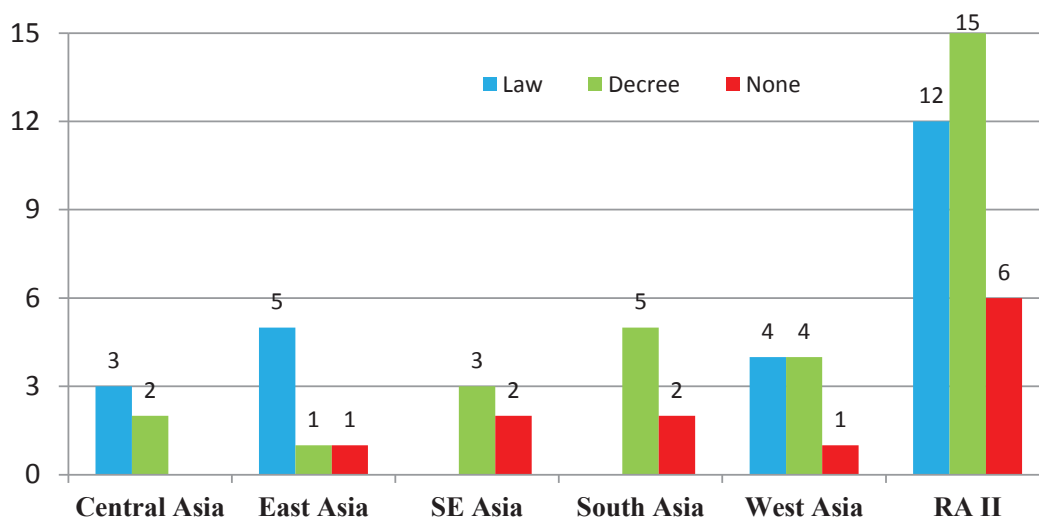


Figure 2.3: Legal instrument for meteorology

Specific details about each Member's legislative arrangements are described in Table 2.4. Six NMHSs are working under direct meteorological Acts/Laws, five under hydrometeorology, four under royal or minister's decrees, two under civil aviation Acts, two under disaster management Acts. Two NMHSs (Nepal and Yemen) do not operate under such legislative instruments and three respondents (Hong Kong, China; Cambodia and India) did not mention any. The existing primary legislative Act that determines the function of NMHS services in RA II Member countries and territories is given in Table 2.4 below.

Table 2.4: Primary legislation that determines the functions of NMHS

Sub-region	Member	Primary Legislative Act
Central Asia	Kazakhstan	RSE Kazhydromet according st.145-2 the Environmental Code of Kazakhstan performs the functions of the National Hydrometeorological Service of the Republic of Kazakhstan
	Kyrgyz Republic	-
	Russian Federation	RF Government Resolution of 23 July 2004 № 372
	Tajikistan	Law of the Republic of Tajikistan on «Hydrometeorological activities». № 86, 02/12/2002.
	Uzbekistan	"On improvement hydrometeorological service of RUz" No. 183 from 14.04.2004
East Asia	China	Meteorological Law
	DPR Korea	The State Meteorological Law
	Hong Kong, China	-
	Japan	Meteorological Service Act
	Macao, China	Aprova a lei orgânica da Direcção dos Serviços Meteorológicos e Geofísicos.
	Mongolia	Law on Hydrometeorology and Environment Monitoring
	Republic of Korea	Weather Act

Sub-region	Member	Primary Legislative Act
South-East Asia	Cambodia	-
	Lao PDR	Minister's Resolutions and Mandates of DMH
	Myanmar	Government Civil Service Regulation, National Disaster Management standing Order, Government Rules and Regulations
	Thailand	2009 Ministry Regulations
	Viet Nam	Prime Minister
South Asia	Afghanistan	Afghanistan Civil Aviation Law
	Bangladesh	Disaster Management Act, 2012.
	India	-
	Maldives	Act No.3/68 (11 Nov 1968)
	Nepal	-
	Pakistan	National Disaster Management Act
	Sri Lanka	Gazette
West Asia	Bahrain	Civil Aviation Law
	Iran	-
	Iraq	Act No. 7 for 1994- Ministry of transportation
	Kuwait	Ministerial Decree
	Oman	Royal Decree No.43/2013 dated 16 September 2013
	Qatar	EMIRI Decree No 47 of 2009
	Saudi Arabia	Royal Decrees
	UAE	-
	Yemen	-

2.4 Other Regulatory Frameworks

In addition to primary acts and legal frameworks for meteorology, many Members have other regulatory frameworks or mutual agreements/arrangements with users for meteorological and other services. The most common such frameworks are: a) government decrees and orders other than meteorology b) Service level agreements with national civil aviation administrations; c) Letters of Agreement (LoA) or Memoranda of Understanding (MoU) with disaster response agencies; and d) MoU with other Members for data sharing, etc.

Each Member has its own regulatory framework for services delivery. Some have several stakeholder agreements and some have none. The details of some of the more important existing regulatory frameworks are given in Table 2.5.

Table 2.5: Additional regulatory frameworks of NMHSs

Sub-region	Member	Regulatory framework
Central Asia	Kazakhstan	<ul style="list-style-type: none"> № 524 Decree of the Republic of Kazakhstan from 26th April 2012 on Approval of the Regulations on the stationary observation stations and others
	Kyrgyz Republic	<ul style="list-style-type: none"> MoU with Finish Meteorological Institute
	Russian Federation	-
	Tajikistan	<ul style="list-style-type: none"> decrees and orders of the President of the Republic of Tajikistan, decrees and orders of the Government of the Republic of Tajikistan, normative legal acts of the Committee for Environmental Protection under the Government of the Republic of Tajikistan, other regulatory and legal acts, including : Convention of the World meteorological Organization, 1992
	Uzbekistan	-
East Asia	China	<ul style="list-style-type: none"> Regulations on Protection of Meteorological Facilities and Observation Environment
	DPR Korea	-
	Hong Kong, China	<ul style="list-style-type: none"> Designated meteorological authority under ICAO Contingency Plan for Natural Disasters
	Japan	-
	Macao, China	-
	Mongolia	<ul style="list-style-type: none"> Agency functions under the Ministry of Environment and Green Development.
	Republic of Korea	-
South-East Asia	Cambodia	-
	Lao PDR	<ul style="list-style-type: none"> MoU with Dept. of Civil Aviation and LoA with National Airport Authority on the service providing for aviation
	Myanmar	<ul style="list-style-type: none"> The rules and regulations of the Government, Ministry of Transport, National Disaster Management Standing Order, WMO's Guideline, etc.
	Thailand	-
	Viet Nam	<ul style="list-style-type: none"> Decision promulgating functions, responsibilities and structure of NHMS Viet Nam; Law on Natural Disaster Prevention and Control; Decision promulgating Regulation and Broadcasting Tropical Depression, Typhoon and Flood Information
South Asia	Afghanistan	<ul style="list-style-type: none"> Agromet Project
	Bangladesh	<ul style="list-style-type: none"> The organization responsible for disaster management is DDM (Directorate of Disaster Management). No LoA or MoU is needed with DDM. LoA with Civil Aviation Authority of Bangladesh. MoUs with Norwegian Meteorological Institute, ADPC at RIMES at Thailand, CPP (cyclone preparedness programme).
	India	<ul style="list-style-type: none"> Allocation of Business, Government of India
	Maldives	<ul style="list-style-type: none"> Civil Service Employment Act and mandated by the government
	Nepal	<ul style="list-style-type: none"> Cabinet decision published in the national gadget
	Pakistan	<ul style="list-style-type: none"> National Disaster Management Act defines the role of the NMHS for early warnings and PMD as the nodal agency for early warning of hydrometeorological hazards.
	Sri Lanka	-

Sub-region	Member	Regulatory framework
West Asia	Bahrain	<ul style="list-style-type: none"> • Agreement with protection agency
	Iran	<ul style="list-style-type: none"> • MOUs with environmental protection organization for warning information. • MOUs with national risk & hazard management for warning information. • MOUs with aviation sector for providing aviation products. • MOUs with national TV to present Weather forecast to public. • MOUs with national entities such as marine transportation and road transportation to provide tailored forecasts.
	Iraq	-
	Kuwait	<ul style="list-style-type: none"> • Ministries, other National Sectors Regional GCCC, Arab League WMO, ICAO
	Oman	<ul style="list-style-type: none"> • Agreement with Directorate General of Air Navigation
	Qatar	-
	Saudi Arabia	-
	UAE	-
	Yemen	-

3 Management and Organization

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

3.1 Human Resources

There is a vast range in the staffing level of NMHSs in RA II, from 45(Cambodia) to 54,426 (China). The total number of NMHS’s employees in 33 responded Members of RA II is 114,258, with China contributing almost half this number. Staffing levels, including gender composition (36% women), are illustrated in Figures 3.1a and 3.1b (Note that gender information for Russian Federation, Japan, Kyrgyz Republic and Saudi Arabia are not available).

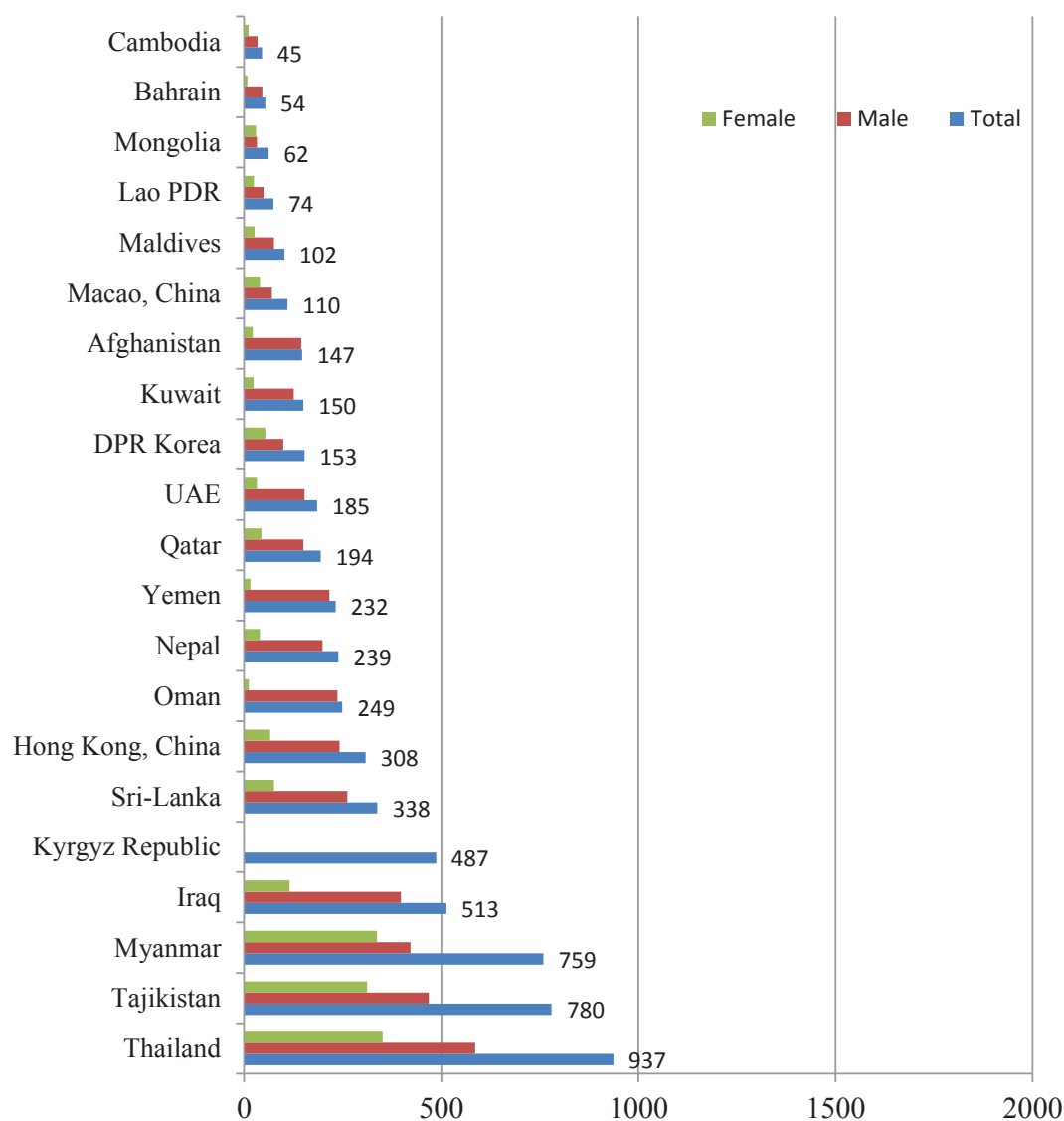


Figure 3.1a: Number of staff in NMHSs with <1000 staff

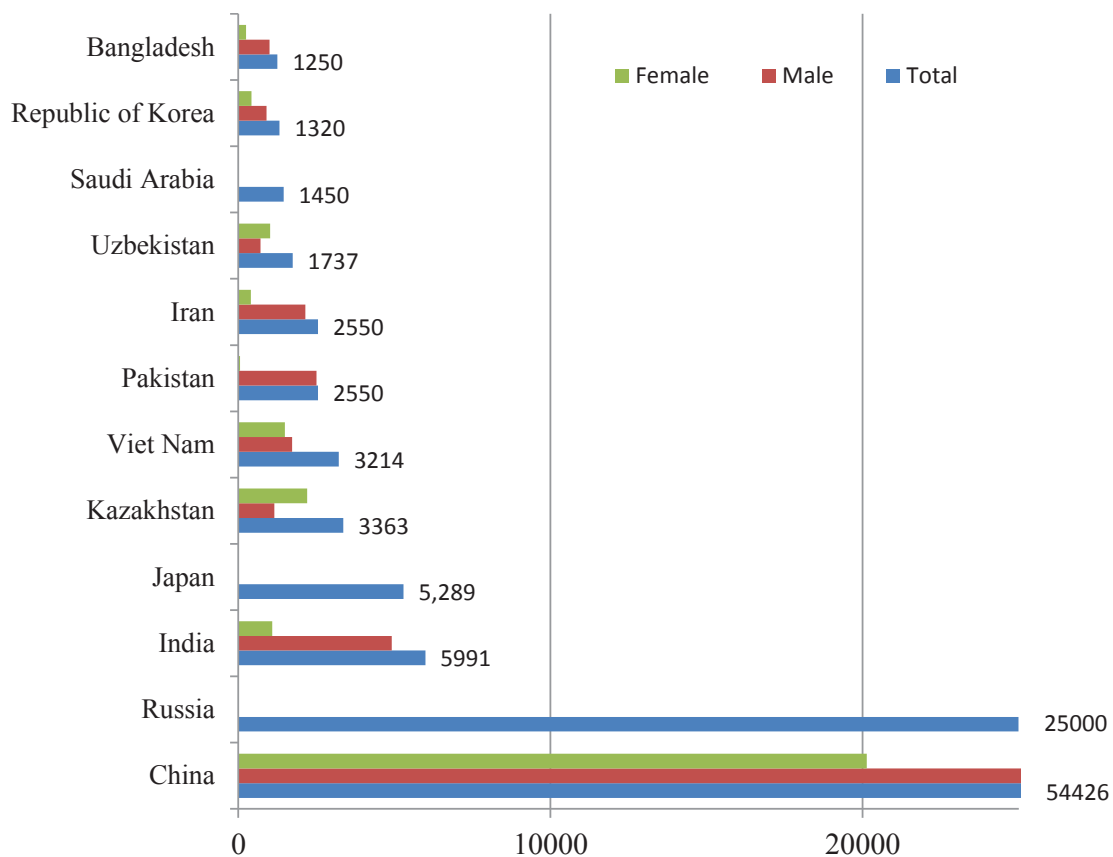


Figure 3.1b: Number of staff in NMHSs with >1000 staff

The level of qualifications and work experience of staff and their strength in number indicate the overall capacity of the institution. The Survey reveals that overall in RA II; over 62% of NMHS staff members possess education qualifications at the university degree level or higher. China and Republic of Korea have more than 80% staff members with university degrees, whilst Maldives has less than 10% staff members holding a university degree.

The average age of the staff of RA II NMHSs varies between 30 and 45 years old, with an average value of 39.10. The level of educational qualifications and average age of NMHS staff in RA II are shown in Table 3.1.

Table 3.1: Education and average age of staffing

Sub-region	Member	Total staff	Staff with higher degree (#, %)	Average age of Staff (year)
Central Asia	Kazakhstan	3363	1155 (34%)	40
	Kyrgyz Republic	487	154 (32%)	45
	Russian Federation	25000	12000 (48%)	45
	Tajikistan	780	468 (60%)	37
	Uzbekistan	1737	352 (20%)	35
East Asia	China	54426	47489 (87%)	-
	DPR Korea	153	95 (62%)	45
	Hong Kong, China	308	177 (57%)	44.4
	Japan	5,289	-	-
	Macao, China	110	35 (32%)	40
	Mongolia	62	12 (19%)	40
	Republic of Korea	1320	1057 (80%)	42.7
South-East Asia	Cambodia	45	13 (29%)	37
	Lao PDR	74	26 (35%)	35
	Myanmar	759	504 (66%)	-
	Thailand	937	555 (59%)	42
	Viet Nam	3214	1732 (54%)	38.61
South Asia	Afghanistan	147	20 (14%)	40
	Bangladesh	1250	350 (28%)	-
	India	5991	2921 (49%)	45
	Maldives	102	6 (6%)	30
	Nepal	239	35 (15%)	35
	Pakistan	2550	1000 (39%)	42
	Sri Lanka	338	48 (14%)	40
West Asia	Bahrain	54	16 (30%)	37
	Iran	2550	1530 (60%)	40
	Iraq	513	217 (42%)	45
	Kuwait	150	48 (32%)	35
	Oman	249	86 (35%)	30
	Qatar	194	110 (57%)	35
	Saudi Arabia	1450	600 (41%)	-
	UAE	185	112 (61%)	40
Yemen	232	48 (21%)	35	

The trend of staffing in NMHSs in RA II during recent 3-5 years was reported to be more or less stable to expanding, with 14 Members reporting no significant change, whilst another 12 Members report an increase in numbers and six Members (Japan, India, Maldives, Bahrain, Iran and Kuwait) reporting a decrease. The breakdown of staffing trends by sub-region is illustrated in Figure 3.2.

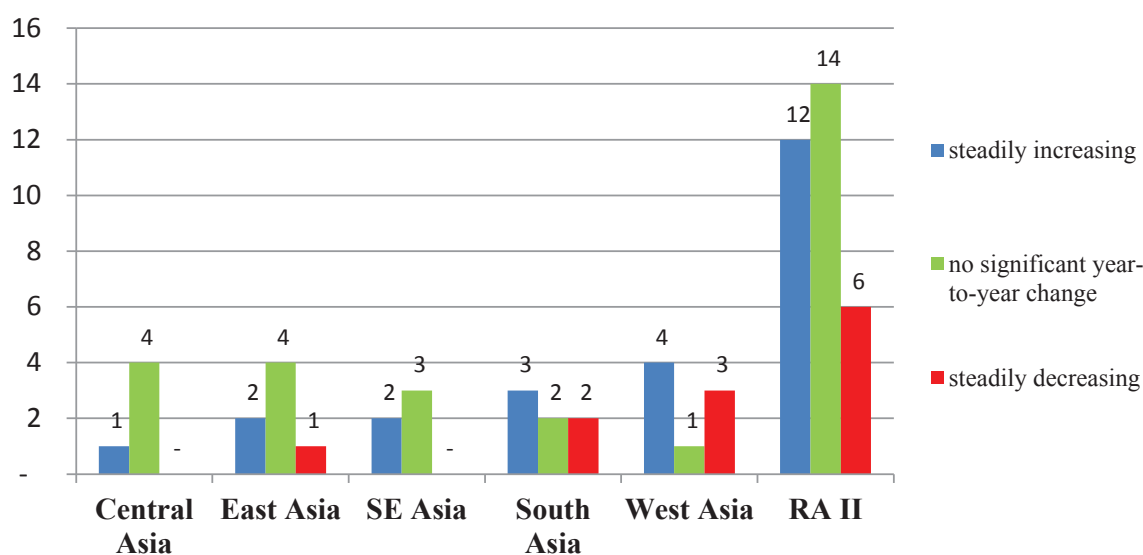


Figure 3.2: Trends of staff numbers in recent 3-5 years

3.2 Budgetary Provision in Year 2013-2014

The total annual budgets of NMHSs across RA II vary considerably, with reported budgets ranging between USD 607 million in Japan and USD 0.3 million in Afghanistan. Qatar reported there is no specific limitation in budget for NMHS. The budget of individual Member NMHS in their most recent fiscal years, in US dollars, is summarized in Table 3.2.

Table 3.2: Budget of NMHS for recent fiscal year

Sub-region	Member	Budget 2013-14 (US dollars)
Central Asia	Kazakhstan	48,463,723.82
	Kyrgyz Republic	1,213,300.18
	Russian Federation	-
	Tajikistan	792,079.21
	Uzbekistan	15,609,437.16
East Asia	China	-
	DPR Korea	-
	Hong Kong, China	33,479,268.61
	Japan	607,008,875.47
	Macao, China	4,375,546.94
	Mongolia	10,928,961.75
	Republic of Korea	317,685,446.44

Sub-region	Member	Budget 2013-14 (US dollars)
South-East Asia	Cambodia	10,037,855.36
	Lao PDR	530,502.99
	Myanmar	2,242,914.98
	Thailand	32,726,150.05
	Viet Nam	36,047,497.88
South Asia	Afghanistan	300,000.00
	Bangladesh	-
	India	81,261,173.41
	Maldives	1,522,776.93
	Nepal	2,060,793.41
	Pakistan	-
	Sri Lanka	2,077,742.85
West Asia	Bahrain	3,183,023.87
	Iran	18,500,000.00
	Iraq	7,692,307.69
	Kuwait	7,067,137.81
	Oman	-
	Qatar	No specific limitations
	Saudi Arabia	-
	UAE	-
	Yemen	1,761,122.20

National Government is the main source of budget for NMHSs in RA II (see table 3.3). Three Members (Kazakhstan, Uzbekistan and Viet Nam) also receive budget under commercial arrangements. Similarly, four Members (DPR Korea, Republic of Korea, Uzbekistan and Iran) reported that there is a provision of cost-recovery in aviation services.

Only Kazakhstan and Kyrgyzstan reported the small amount of budget 7.4% and 1-3% coming from non-government sources respectively. Nepal reported that they have running World Bank managed Pilot Project for Climate Resilience (PPCR) (about US\$ 25 million for 5 years). Once the project is phased out regular budget will be reduced significantly.

Table 3.3: Budget Sources of NMHS for recent fiscal year

Budget Sources	Sub-region					RA II (33)
	Central Asia (5)	East Asia (7)	SE Asia (5)	South Asia (7)	West Asia (9)	
Government	5	7	5	7	9	33
Commercial activities	2	-	1	-	-	3
Cost recovery	1	2	-	-	4	4

In addition to regular government budget, many NMHSs received additional budget extra fund in the form of project funded by international agencies, national agencies and research projects (see table 3.4). Survey revealed that 15 Members received projects fund from international agencies whereas 10 Members received projects fund from national agencies. Eleven Members reported that they have research projects. Funding from international agencies is relatively higher in central, South-East and South Asia. Four out of five Central Asia said they have currently research projects fund.

Table 3.4: Funding Sources of NMHS Budget

Budget Fund Sources	Sub-region					RA II (33)
	Central Asia (5)	East Asia (7)	SE Asia (5)	South Asia (7)	West Asia (9)	
Projects funded by international agencies	4	1	4	5	1	15
Research projects	4	2	1	2	2	11
Projects funded by national agencies	2	2	2	2	2	10

3.3 Scope of Services

Meteorology, including observations, data processing and forecasting and warning services is the common operational responsibility of NMHSs in RA II. All but one respondent (Oman) also reported the provision of climate services as an operational responsibility too. Table 3.5 summarizes the range of operational services provided by each NMHS in RA II. Some Members specified the specific services e.g. radiological monitoring by Hong Kong, China; Volcanology by Japan; agro-meteorology by Myanmar, Thailand, and India; and glaciology and Glacial Lake Outburst Flood (GLOF) by Nepal.

Table 3.5: Scope of services provided by NMHS

RA II Members	Meteorology	Hydrology	Climate	Air/Water quality	Tsunami	DRR/DRM	Seismology	Oceanography	Others
Central Asia									
Kazakhstan	X	X	X	X					
Kyrgyz Republic	X	X	X	X					
Russian Federation	X	X	X	X	X	X		X	
Tajikistan	X	X	X	X		X			emergency situations
Uzbekistan	X	X	X	X		X			

RA II Members	Meteorology	Hydrology	Climate	Air/Water quality	Tsunami	DRR/DRM	Seismology	Oceanography	Others
<u>East Asia</u>									
China	X		X	X		X			
DPR Korea	X	X	X	X	X			X	
Hong Kong, China	X	X	X		X	X	X	X	Radiological monitoring and assessment
Japan	X		X		X		X	X	Volcanology
Macao, China	X		X	X	X		X		
Mongolia	X	X	X	X					
Republic of Korea	X	X	X		X	X	X	X	
<u>South-East Asia</u>									
Cambodia	X		X					X	
Lao PDR	X	X	X				X		
Myanmar	X	X	X		X		X		Agro- meteorology
Thailand	X	X	X		X		X	X	Agro meteorology
Viet Nam	X	X	X	X		X			
<u>South Asia</u>									
Afghanistan	X	X	X	X		X			
Bangladesh	X		X		X		X		
India	X	X	X	X	X	X	X	X	Agro-meteorology & Aviation
Maldives	X	X	X		X		X		
Nepal	X	X	X	X		X			Glaciology, GLOF mitigation,
Pakistan	X	X	X	X	X	X	X	X	
Sri Lanka	X		X		X				
<u>West Asia</u>									
Bahrain	X		X				X		
Iran	X		X			X		X	
Iraq	X	X	X				X		
Kuwait	X		X						
Oman	X				X				
Qatar	X		X				X		
Saudi Arabia	X		X	X		X			
UAE	X		X	X	X	X	X		
Yemen	X		X		X				

3.4 Business Model

The Survey examined the business model under which each NMHS operates. Most NMHSs in RA II are Government/State owned enterprises providing public weather services without commercial activities. Four RA II Members (Tajikistan, Uzbekistan, Viet Nam and Oman) reported that their NMHSs also engage in commercial activities (see Figure 3.3). Only one Member UAE reported that it is operated under private company modality.

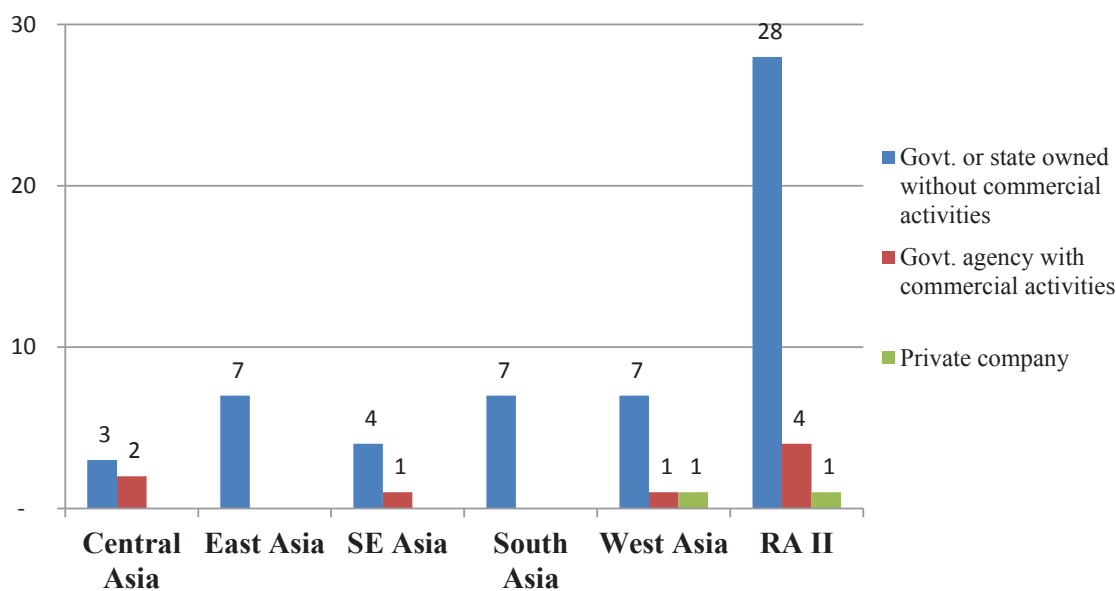


Figure 3.3: Business model of NMHSs

3.5 NMHS Quality Management Programme

The context for this Survey question was implementation of ICAO Annex 3 – Meteorological Service for International Air Navigation and the mandatory need for Quality Management Systems (QMSs) from 15 November 2012 in all contracting States.

The majority of Members responded that their NMHS has some kind of Quality Management programme. Twelve Members (Kyrgyz Republic, Russian Federation, Tajikistan, China, DPR Korea, Republic of Korea, Cambodia, Afghanistan, Bahrain, Iraq, Kuwait and Qatar) have implemented QMS across their whole NMHS, including for aviation, whilst thirteen (Uzbekistan; Hong Kong, China; Japan; Macao, China; Myanmar; Thailand; Bangladesh; India; Nepal; Pakistan; Iran and Saudi Arabia) have implemented QMS for aviation services and seven Members (Kazakhstan, Lao PDR, Viet Nam, Maldives, Sri Lanka, Oman and Yemen) reported an absence of QMS frameworks. One Member UAE remained silent in this question. Sub-region wise QMS implementation status in RA II is shown in figure 3.4.

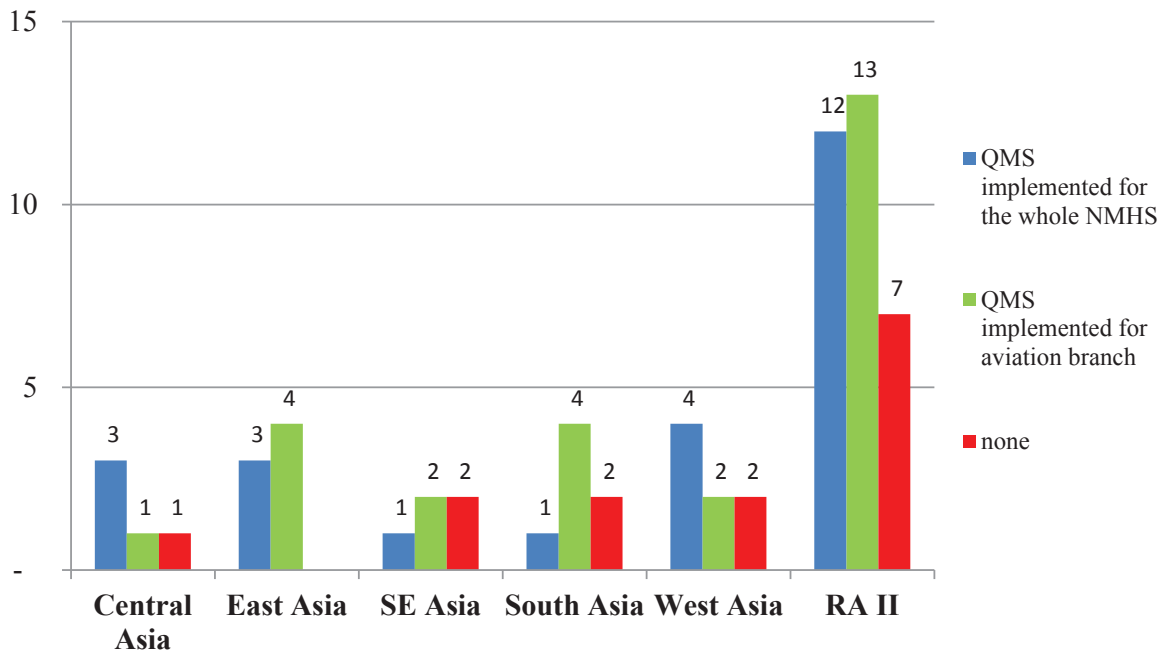


Figure 3.4: QMS implementation status

3.6 Development/Strategic Plan for Next 3- 5 Years

The Survey examined the extent to which RA II Members had strategic plans or national development in place that identify the priorities of the NMHSs over the next few years. All Members reported having such plans in place.

The most frequently cited strategic priority areas identified in these plans were enhancing the monitoring infrastructure, and improving operational forecast and warning services, which were reported by 31 Members and closely followed by strengthened IT capability with 29 responses, and enhanced climate services (implementation of the GFCS); and training, education and capacity building of staff with 28 responses each. However, the top three priorities of West Asia are improved IT, enhanced climate services; and training, education and capacity building. Table 3.6 provides a summary of the responses, ordered according to the most commonly reported priority areas with sub-region disaggregation.

Table 3.6: Priority areas of Development/Strategic Plan

Priority Area	Sub-region					RA II
	Central Asia	East Asia	SE Asia	South Asia	West Asia	
Enhancing the monitoring infrastructure	5	7	5	7	7	31
Improving operational forecasts including the warning products	5	7	5	7	7	31
Improved IT (including better use of web services and social media)	4	6	5	6	8	29
Enhanced climate services (implementation of the GFCS)	2	6	5	7	8	28
Training, education and capacity building of staff	4	5	4	7	8	28
Automation of the observing networks	5	5	5	6	6	27
Implementation of WIS	4	6	4	6	5	25
Research & development	3	6	3	7	6	25
Extending services to new user sectors	3	6	4	6	5	24
Improving the management and institutional arrangements	4	5	5	4	3	21
Implementation of WIGOS	3	6	1	4	4	18
Development and implementation of new commercial services/products	2	3	2	3	4	14

4 Operations and Services

This section provides a summary of the scope of services delivered by Member NMHSs and the areas in need of attention in terms of coverage, timeliness and meeting the needs of users.

4.1 Types of Service Provisions

Table 4.1 summarizes the different types of services provided by RA II NMHSs. Public weather forecasts and warning services are provided by all and most also provide climate, agro-meteorological and aviation services. Marine services and hydrological services are also commonly provided by the Members. It is found that only a small numbers of NMHSs provided air/water quality services, earthquake/seismological services, tailored services to specific users, tsunami and volcano services.

Table 4.1: Type of services provisions

Type of Services	Sub-region					RA II
	Central Asia	East Asia	SE Asia	South Asia	West Asia	
Public Weather Services (PWS)	5	7	5	7	9	33
Warning services	5	7	5	7	9	33
Climate services	4	7	5	7	7	30
Agro-meteorological services	5	6	5	7	5	28
Aviation services	2	6	4	7	9	28
Marine Services	1	4	4	5	8	22
Hydrological services	5	3	5	5	2	20
Air/water quality	5	3	1	2	3	14
Earthquake/Seismological Services	-	4	3	4	3	14
Tailored services to specific economic sectors	3	3	2	3	2	13
Tsunami Services	1	4	2	5	1	13
Volcano Services	-	3	-	-	1	4

4.2 Current Level of Service Provisions

An assessment of the current adequacy of service provision was provided by respondents and is summarized in Figure 4.1. The majority of respondents rated their NMHS service level as satisfactorily meeting most requirements. Public weather, warnings, and aviation services, were most consistently rated as meeting most or exceeding requirements. Climate, earthquake/volcano, hydrological services, as well as tsunami and marine services were also rated as satisfactory or better by a majority of Members who provide these services. Tailored services to specific economic sectors and agro-meteorological services were identified by many respondents as only partly meeting requirements and were perhaps the service most in need of development. Air/Water quality service is not applicable to as many as one third of the Members in RA II.

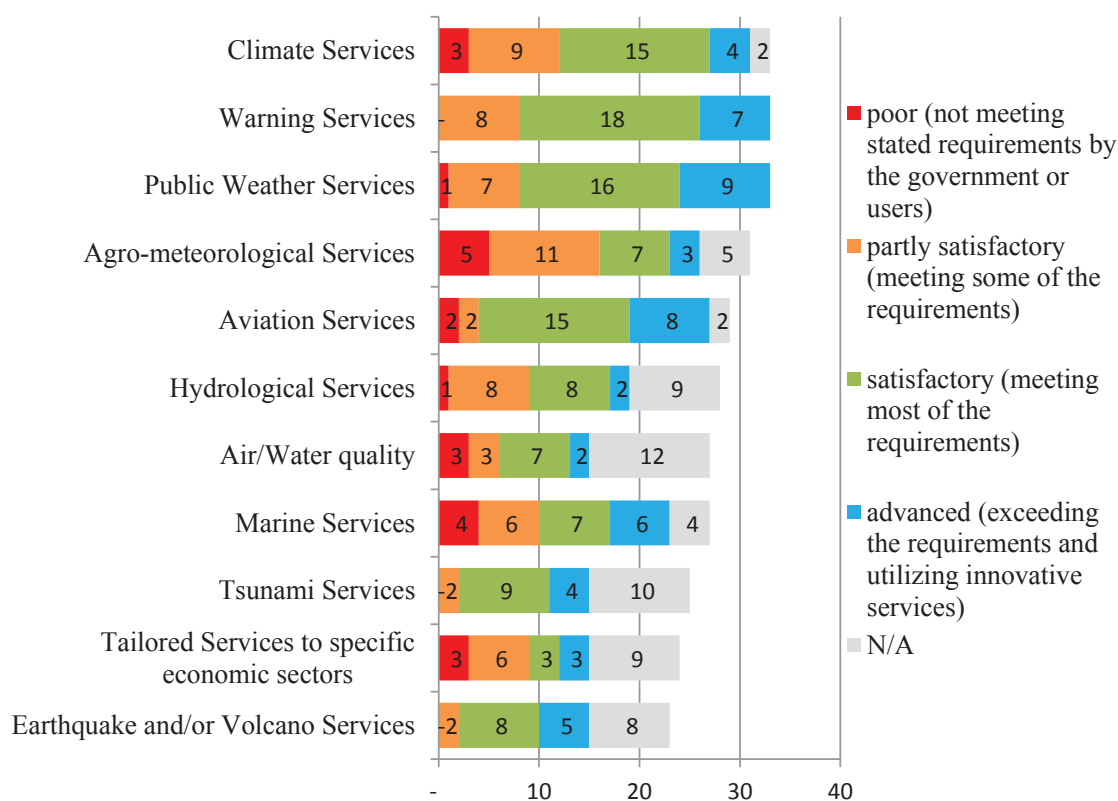


Figure 4.1: Current level of service provisions

Respondents were also asked to rate the adequacy of national research capability to support service delivery. Research in support of early warning systems, marine and aviation services were seen as the advance level that meets or exceed users' requirement, although in all instances, there were significant numbers of Members who rated the underpinning research as being satisfactory or only partly satisfactory. Similarly, considerable numbers of Members also rated the research capabilities as poor not meeting stated requirement by government or users. Details are given in Figure 4.2 below.

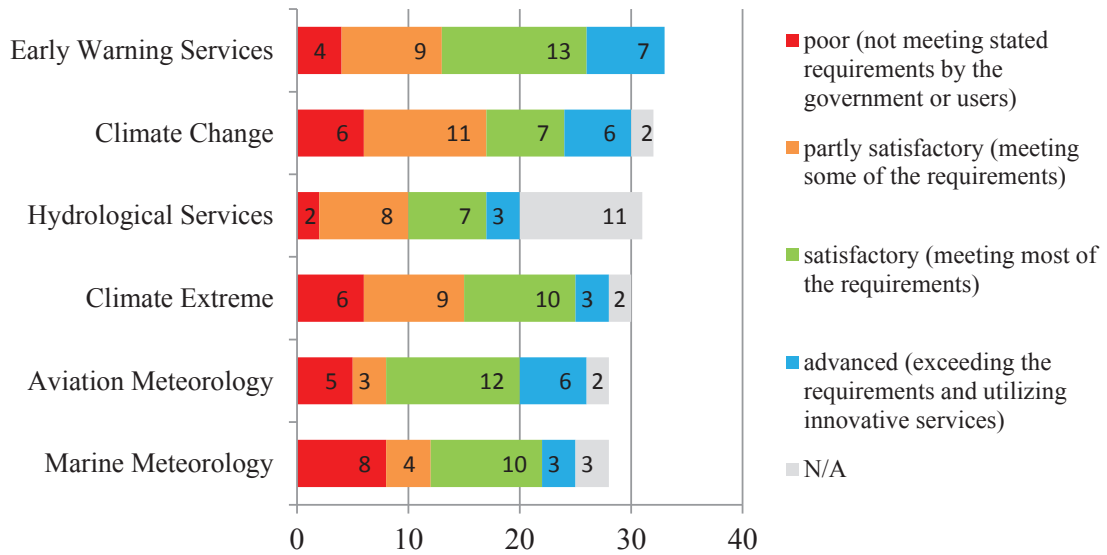


Figure 4.2: Level of research capabilities and development areas

4.3 Adequacy of Monitoring Infrastructure

Members were asked to rate the inadequacy of monitoring infrastructure (observations and IT). Most commonly reported concerns related to upper air observations, automation of the observing networks and weather radar observations. Concerns about the IT and telecommunication (national) facilities, and surface observation were also widely reported. These results are summarized in Figure 4.3 below.

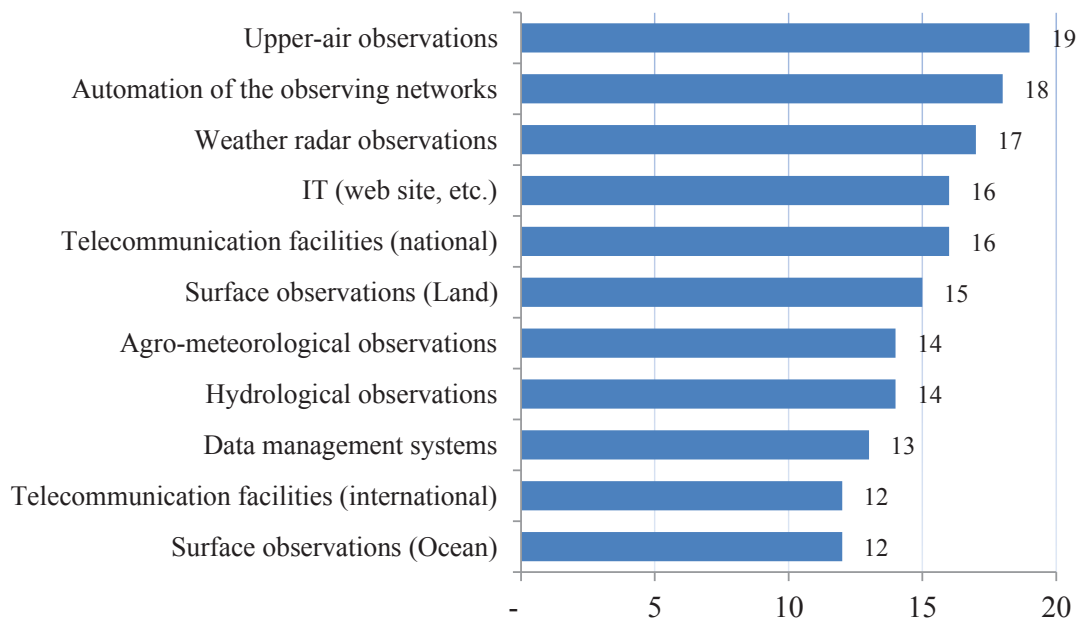


Figure 4.3: Inadequacy of equipment and infrastructure

These results by sub-region are presented in Table 4.2. The most common concerns shared by South-East, South and West Asian Members is upper-air observations. Automation of the observing networks and weather radar observation are common concerns of Central, South-East and South Asian Members. Similarly, a national telecommunication facility is a major concern among the Central, East and South-East Asian Members.

Table 4.2: Areas of equipment and infrastructure inadequacy

Areas of Inadequacy	Sub-Region					RA II
	Central Asia	East Asia	SE Asia	South Asia	West Asia	
Upper-air observations	3	2	4	5	5	19
Automation of the observing networks	3	3	4	5	3	18
Weather radar observations	4	3	4	4	2	17
IT (web site, etc.)	4	3	4	3	2	16
Telecommunication facilities (national)	4	3	3	3	3	16
Surface observations (Land)	4	2	4	3	2	15
Agro-meteorological observations	3	1	3	4	3	14
Hydrological observations	3	1	3	3	4	14
Data management systems	3	1	4	3	2	13
Surface observations (Ocean)	-	2	3	3	4	12
Telecommunication facilities (international)	4	2	3	1	2	12

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. A significant number of Members (7 from 33 respondents) reported that they did not have sufficient staff to maintain around-the-clock operations.

On the other hand, all but seven respondents (Kazakhstan, DPR Korea, Mongolia, Afghanistan, Bahrain, Iraq and Yemen) reported that they had early warning systems implemented. These two aspects of NMHS capability are summarized in Figure 4.4.

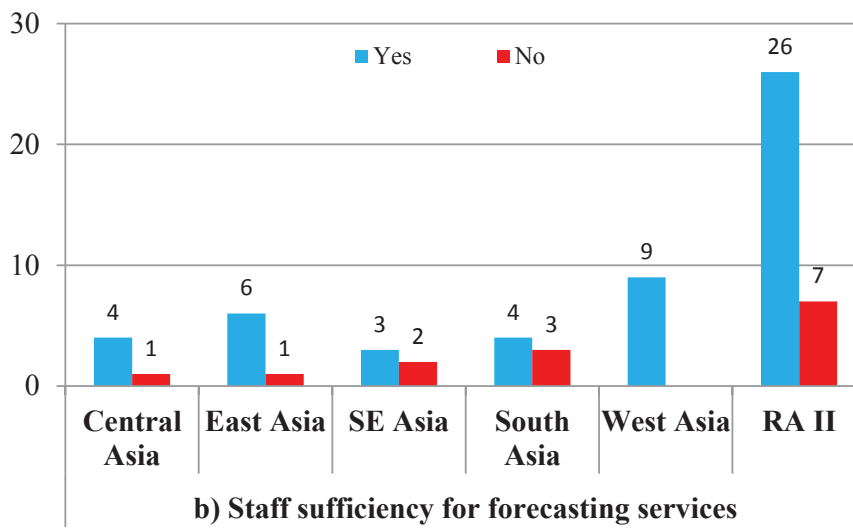
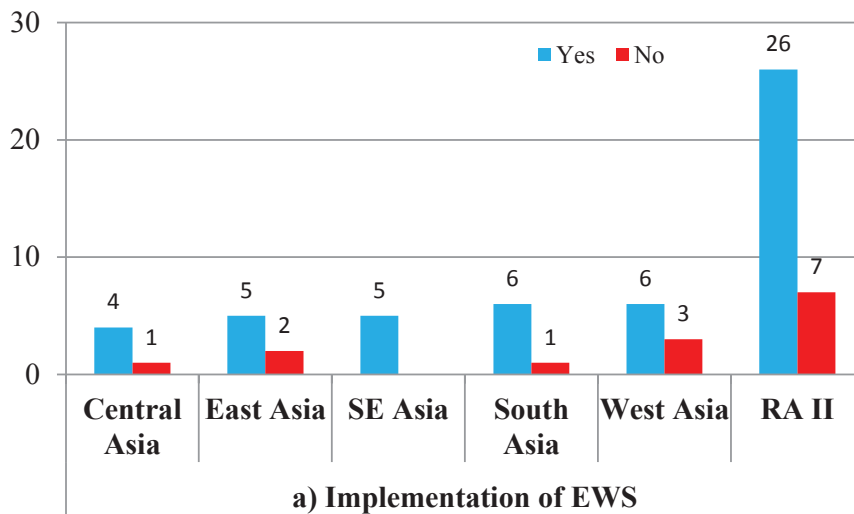


Figure 4.4: Forecasting capacity of NMHSs

5 Challenges and Priorities for RA II

This section examines the major NMHS challenges and gaps that Members identified 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 NMHSs in order of significance (see Figure 5.1 below).

The most significant/widespread challenges identified were: adequacy of qualified personnel, adequacy of climate services, and NWP modeling capacity. Other challenges such as improved visibility and adequacy of EWS services for DRR, relationship with private sector, introduction and maintenance of QMS, anticipated budget and staff cuts, data policies, and adequacy of the existing observing system were also rated relatively higher than average value of 2.500. Only adequacy of telecommunication facilities and capacity is rated as below average value of 2.500.

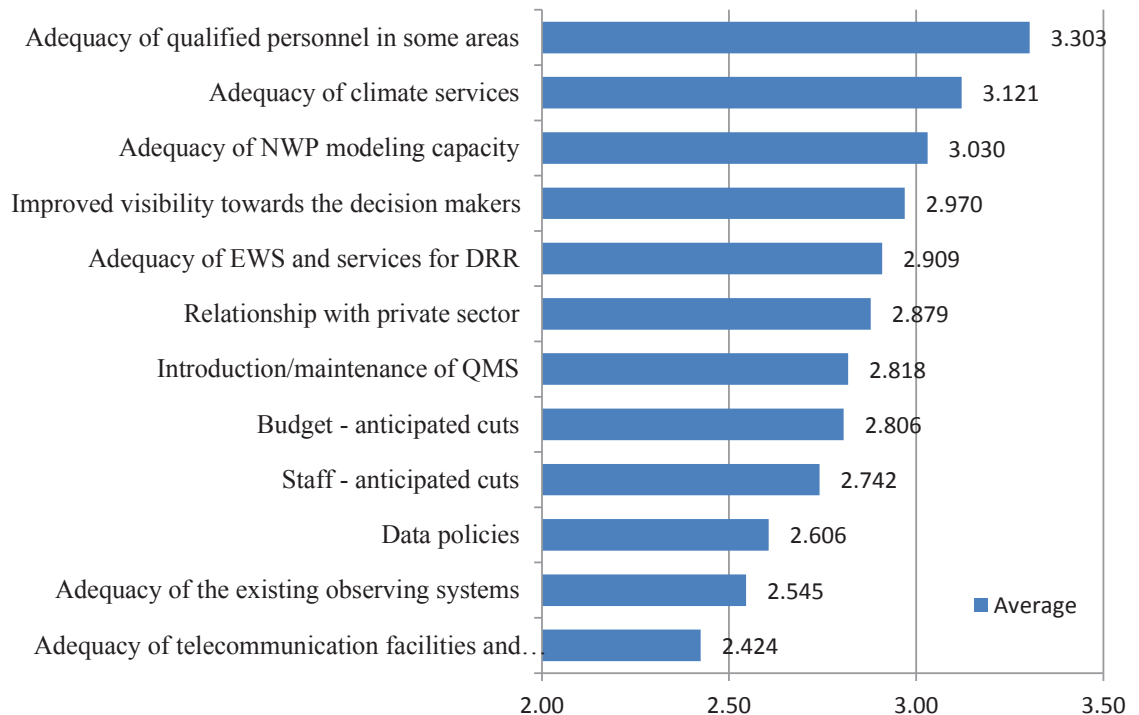


Figure 5.1: Challenges of NMHSs

An alternative analysis was also undertaken that identified the three most commonly identified challenges under each of the four categories slight, moderate, moderate/serious and serious. These are summarized in Table 5.1 below.

Table 5.1: Challenges at different levels

Serious	Moderate to Serious
<ul style="list-style-type: none"> • Adequacy of qualified personnel in some areas • Adequacy of NWP modeling capacity • Budget - anticipated cuts 	<ul style="list-style-type: none"> • Adequacy of climate services • Improved visibility towards the decision makers • Adequacy of EWS and services for DRR
Moderate	Slight
<ul style="list-style-type: none"> • Anticipated staff cuts • Data policies • Relationship with private sector 	<ul style="list-style-type: none"> • Introduction/maintenance of QMS • Adequacy of telecommunication facilities and capacity • Adequacy of the existing observing systems

Apart from these challenges, continuous skill development and retention of qualified personnel, increasing operational cost, and potential competition from overseas commercial service providers are some of other challenges in some of RA II Members for long term sustainability.

Figure 5.2 illustrates challenges of NMHSs by sub-region. The order of listed challenges varies significantly among the sub-regions in RA II. Top challenges are: anticipated budget in Central Asia; adequacy of climate services and relationship with private sectors in East Asia; adequacy of qualified personnel and improved visibility towards the decision makers in South-East Asia; adequacy of qualified personnel and introduction/maintenance of QMS in South Asia; and adequacy of climate services and adequacy of qualified personnel in West Asia. It is found that the adequacy of qualified personnel is one of the serious challenges in all sub-regions, and the challenges are relatively less serious in East Asia as indicated by lower average values.

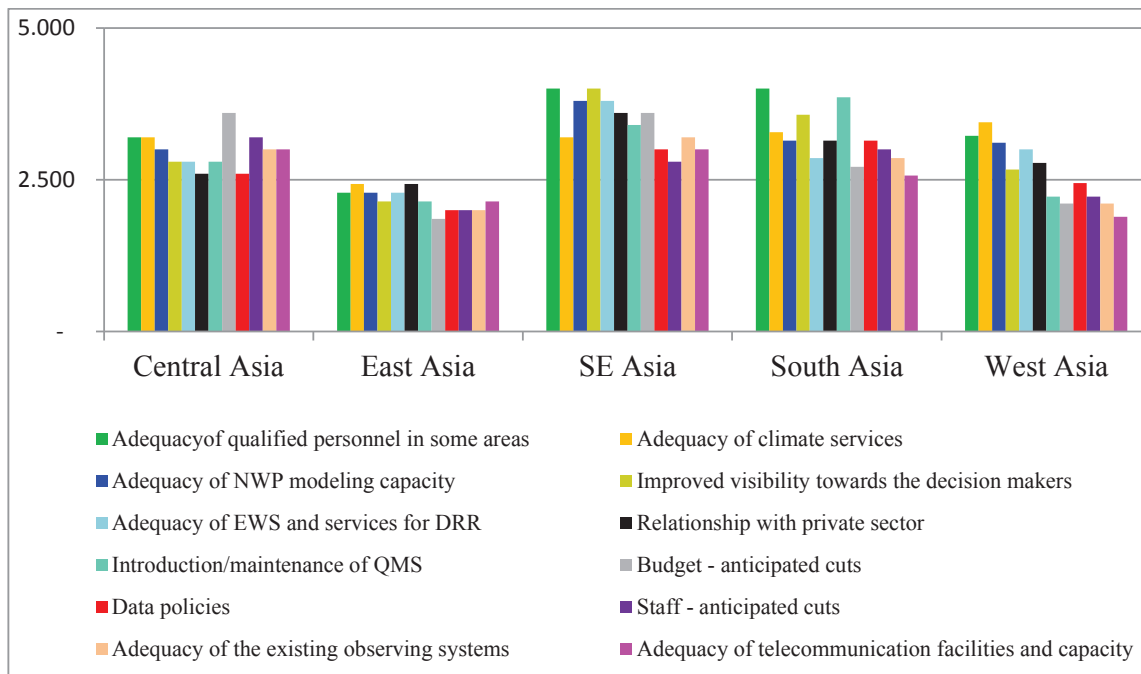


Figure 5.2: Challenges of NMHSs by sub-region

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 9 priority areas. Table 5.2 provides the comparative priority areas based on weighted value weighing top priority as highest value of 6 and decreasing subsequently.

Table 5.2: Weighted priority areas

S. N.	Priority Areas	Priority						Response Frequency	Weighted Value
		1	2	3	4	5	6		
1	WIGOS - WIS including GISC	6	10	2	3	3	7	31	116
2	Capacity development	8	6	5	2	1	2	24	108
3	Strengthening of Climate Services including GFCS	2	4	7	10	5	-	28	100
4	Enhancement of services delivery	3	3	6	5	2	3	22	79
5	Disaster Risk Reduction/Early Warning System DRR/EWS	3	4	3	6	3	1	20	75
6	Improvement of QMS	3	1	3	2	7	3	19	58
7	Scientific research	3	1	-	3	5	5	17	47
8	International partnerships	-	-	4	-	2	1	7	21
9	Strengthening good governance	1	-	-	-	1	3	5	11

Priority 1: Implementation of WIGOS and WIS including GISC: expressed in terms of the need to maintain and improve observing systems, the quality of observations, improve communication and information sharing, telecommunication and IT infrastructures and database management, and regional and national implementation of WIGOS;

Priority 2: Capacity Building: identified by Members in terms of budget and staffing resource deficiencies, education and training needs, exchange of experts and modeling capacity such as NWP;

Priority 3: Strengthening of Climate Services including GFCS: expressed in terms of the need for improved climate services including climate change, variability and prediction services; and the implementation of GFCS at national and regional levels;

Priority 4: Enhancement of Services – PWS, Hydrology and Aviation: expressed in terms of developing the capacity for adequate services in support of public weather services, aviation, and hydrology, including medium- and long-range forecast services;

Priority 5: Disaster Risk Reduction/Early Warning System (DRR/EWS): expressed in terms of reliable observation system, capacity enhancement of both human resources and observation system to issue early warning and emergency services;

Priority 6: Improvement of Quality Management System (QMS): expressed in terms of observer and forecaster training in support of QMS implementation; application in specific sectors commonly identified in aviation sector;

Priority 7: Scientific Research: expressed in terms of joint research on surface & upper air observations, climate change, and regional data acquisition and sharing;

Priority 8: Cooperation and Partnerships: expressed in terms of improving outreach to the community, encouraging engagement with local government, raising the effectiveness and efficiency of regional activities, building common positions on issues like data policy, commercialization and public/private sector relationships; and

Priority 9: Strengthening good governance: expressed in terms of improving legal and technical regulation, developing and/or strengthening SOP.

Sub-regional priority areas are shown in Figure 5.3 below. The top priority areas are: WIGOS-WIS including GISC in Central Asia; Disaster Risk Reduction and Early Warning System, and WIGOS-WIS including GISC and Strengthening of Climate Services including GFCS in East Asia; Disaster Risk Reduction and Early Warning System, and Capacity Development in South Asia; and Capacity Development and WIGOS-WIS including GISC in South-East Asia and West Asia. Priority areas of sub-regions may represent the specific needs of the sub-region. WIGOS-WIS including GISC, capacity building and strengthening of climate services including GFCS are priority areas in most of the sub-regions. Enhancement of services delivery-PWS, Hydrology and Aviation is still priority area in West Asia and Central Asia. Improvement of QMS is also one of the high priorities in South Asia.

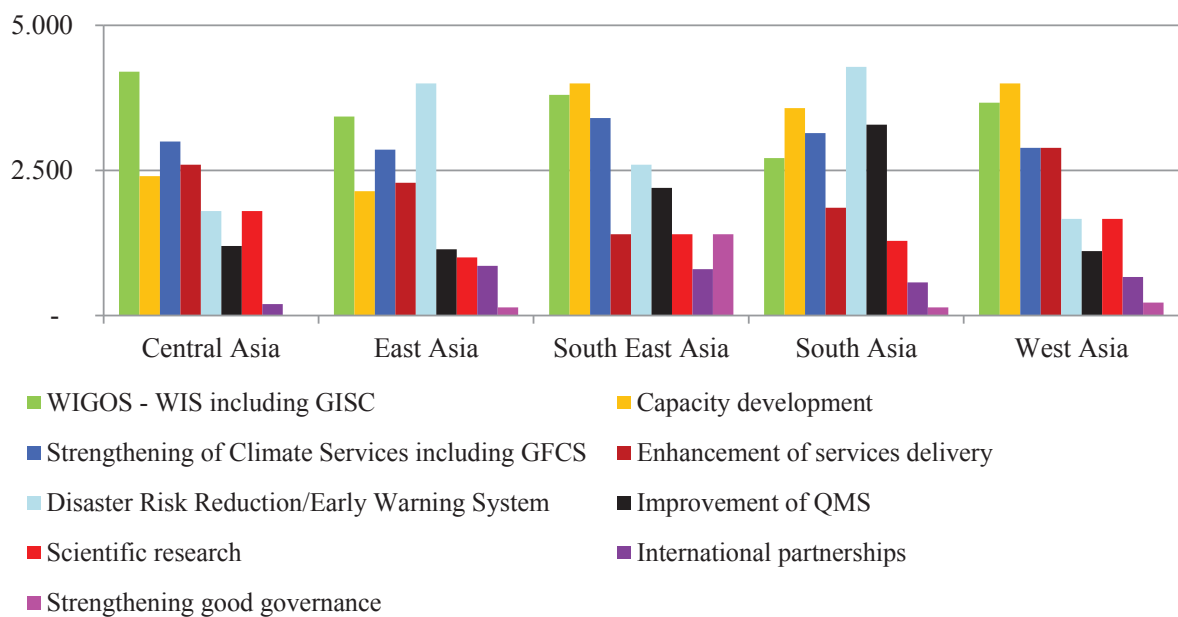


Figure 5.3: Weighted priority areas by sub-region

In addition to this group of five priority areas, Members expressed other priorities namely improvement of quality management system (QMS); scientific research; cooperation and partnerships; and strengthening good governance. Apart from these listed priorities, some Members also have their own specific priorities such as commercialization of services, strengthening the institutional regulatory framework of NMHSs, development of Numeric Weather Prediction (NWP), and seasonal climate prediction.

6 Suggestions for the RA II Activities

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

6.1 Participation in Subsidiary Bodies

Members were surveyed to determine their ability to participate in the working mechanisms (Working Groups, Task Teams, etc.) of RA II. The majority of responses (19) indicate that participation in this work is only possible with financial support from WMO. Seven Members (three from East Asia, one each from other sub-regions) indicated that they are able to allocate their own resources to support participation in meetings of subsidiary bodies. Eight Members expressed an ability to participate through electronic means only (e.g., web forum, email, WebEx conferences etc.). Three Members (two from South Asia and one from West Asia) mentioned that there is no possibility to allocate staff to support regional activities. The responses are shown in Figure 6.1 below.

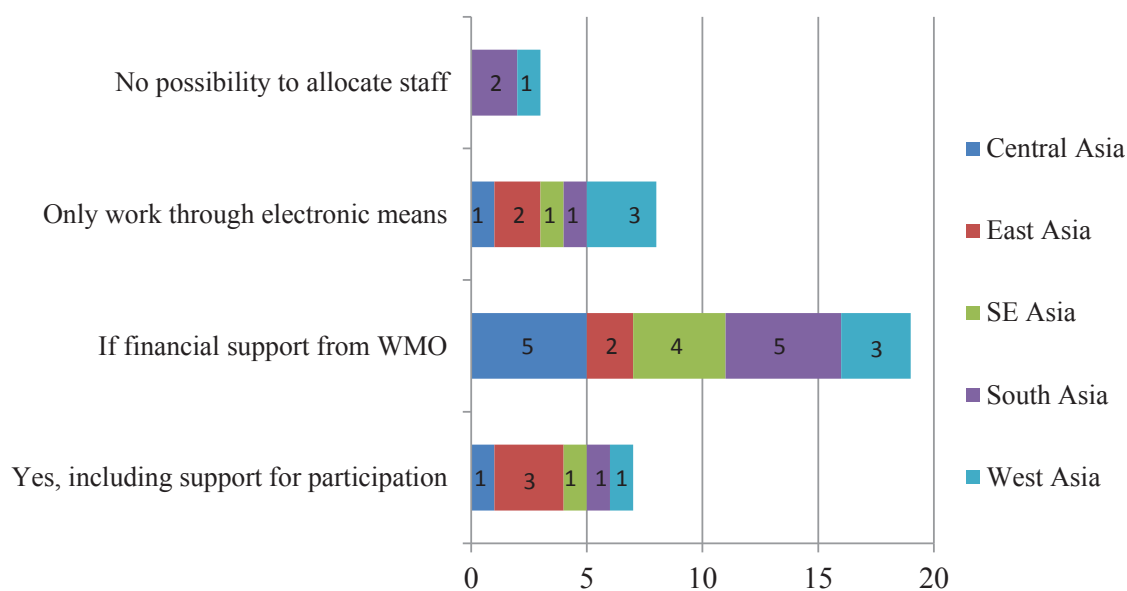


Figure 6.1: Support to subsidiary bodies

Budget constraint and insufficient staff in NMHSs are the main hindrance to support the activities of RA II subsidiary bodies. Insufficient staff resources is major problem in West Asia whilst budget constraints in South-East Asia. Five Members reported the language problem among them, two in Central Asia and one each in East Asia, South Asia and West Asia. The main constraints on participation in RA II subsidiary bodies are summarized in Figure 6.2 below.

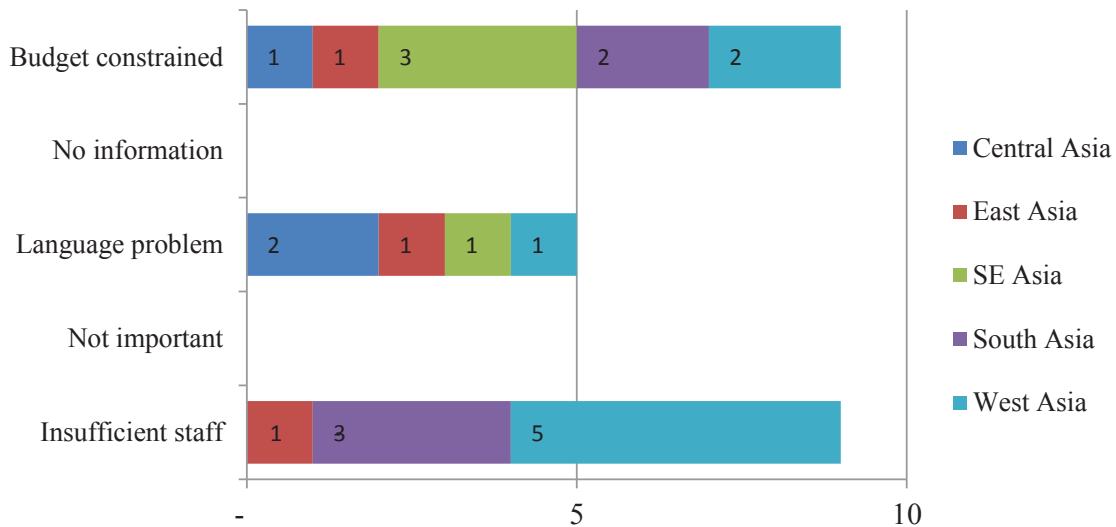


Figure 6.2: Reason for not supporting subsidiary bodies

Members were also 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 was expressed for three types of activities: regional implementation plans (WIS, WIGOS, GFCS etc.); regional capacity development events such as forum, seminar/conference /workshops, cooperation and partnership; and assisting in setting up implementation project and providing guidance material on the implementation of priority programmes and projects. See Figure 6.3 below for a summary of the average usefulness rating across RA II.

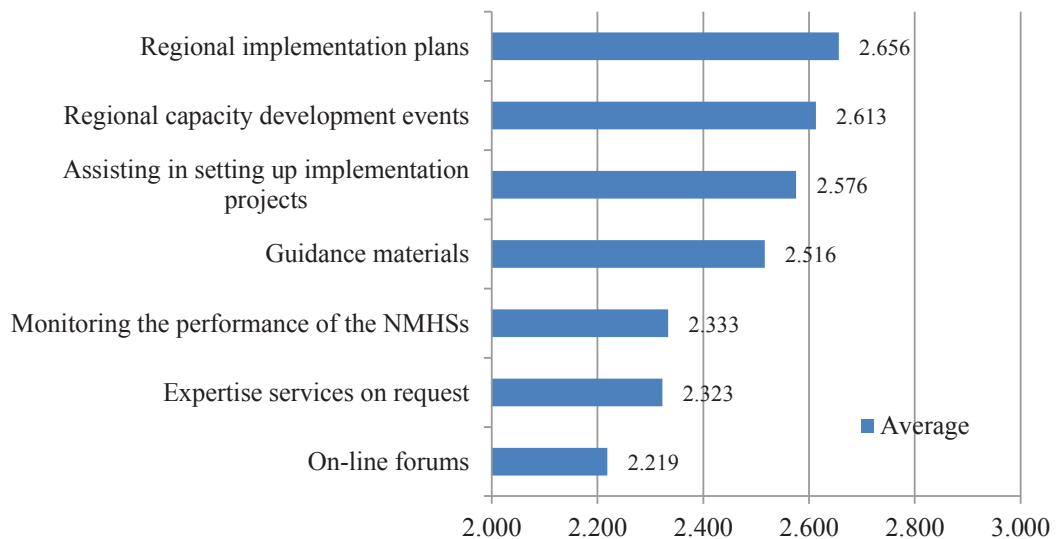


Figure 6.3: Useful activities of subsidiary bodies

Table 6.1 presents a numerical breakdown of level of usefulness of regional activities under each category with sub-region representations. It is revealed that majority of Members rated listed regional activities as either useful or very useful. Three Members one each from South-East, South and West Asia rated monitoring the performance of the NMHSs, one Member from South-East rated guidance material and one Member from East Asia rated on-line forums as not useful.

Table 6.1: Number of respondents by outcome and level of usefulness

Useful Outcomes	Sub-Region															RA II		
	Central Asia			East Asia			SE Asia			South Asia			West Asia					
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Regional implementation plans	-	2	2	-	2	5	-	1	4	-	2	5	-	4	5	-	11	21
Regional capacity development events	-	1	3	-	4	3	-	2	2	-	-	7	-	5	4	-	12	19
Assisting in setting up implementation projects	-	3	2	-	2	5	-	2	3	-	3	4	-	4	5	-	14	19
Guidance materials	-	2	2	-	4	3	1	1	2	-	3	4	-	3	6	1	13	17
Monitoring the performance of the NMHSs	-	4	1	-	4	3	1	1	3	1	2	4	1	5	3	3	16	14
Expertise services on request	-	2	1	-	7	-	-	3	2	-	4	3	-	5	4	-	21	10
On-line forums	-	2	2	1	6	-	-	3	2	-	5	2	-	7	2	1	23	8

Note: 1 = not useful, 2 = useful and 3 = very useful

6.2 Supports from Members and Secretariat

The final part of this section examined the kind and level of support sought by RA II Members from the WMO Secretariat and from other Members.

With regard to support from Members, although there was a wide range of responses, the strongest emphasis was on training, joint/twinning capacity development projects (NWP, GFCS, climate change, hydrology, glaciology), exchanges of expertise, technical support (e.g., for implementation of QMS, strengthening automatic and upper air observation networks), sharing and production of data, developing joint research activities/projects and assistance in developing and/or strengthening regulation and SOP.

Similarly, respondents identified financial and coordination support as a key expectation from the WMO Secretariat. The responses provided a number of suggestions for improving this, including financial assistance for participation in regional events that promote the visibility and mandate of NMHSs. Most of the responses indicate that the Secretariat should review its working mechanisms and adopt a more practical approach to foster regional and sub-regional cooperation to tackle challenges and increase its efficiency and effectiveness in coordinating activities and assisting Members. Some Members pointed out the Secretariat's role in coordination and facilitation of VCP activities.

Specific suggestions focused on enhancement of regional data exchange network, continued assistance with information sharing on regional activities, involvement of experts in international or/and regional researches, mobilization of regional/international resources in support of humanity/DRR initiatives, support and guidance in developing the projects and technology transfer, practical guides for implementation of WIS/GISC, GFCS, QMS.