

RA VI WORKING GROUP ON HYDROLOGY the eleven session 2009

REPORT OF THE CHAIRMAN OF THE GROUP

Submitted by Jan Kubát (Czech Republic)

The Working Group on Hydrology (WGH) Regional Association VI (Europe) was re-established by Resolution 17 (XIV-RA VI) from the fourteen RA VI session in September 2005 in Heidelberg, based on proposal from the tenth session of the WGH which was held in Prague in May 2005. The intercessional period of the activity of the group was nearly 4 years.

Jan Kubát (Czech Republic) and Jean-Michael Tanguy (France) were designated as chairman and respectively vice-chairman of the group. The Terms of Reference of the group and its working plan contains seven topics that were considered as relevant in the region during given period (see Annex I). A subgroup was established on flood forecasting and warning with the aim to promote cooperation among meteorologists and hydrologists in this field and 5 other rapporteurs on specific topics were designated. The group consisted of 8 core members and other experts from RA VI countries they expressed their willing to participate in activities of the group.

Subgroups and rapporteurs in the intercessional period

The Subgroup on Flood Forecasting and Warning - chairman Ilmar Karro (Sweden).

Rappourteurs on following specific topics are:

Public relations and the visibility of Hydrological services

Marinela Simota (Romania)

Networking for contributions to regional initiatives related to Water – in particular to the Water Framework Directive

Markku Puupponen (Finland)

Water monitoring and assessment
(technical aspects)

Valerii Vuglinsky (Russian Federation)

Climate and water

Teemu Kokkonen (Finland)

Potential extreme floods

Bogdan Ozga-Zielinski (Poland)

Drought assessment and forecasting

Guisepina Monacelli (Italy)

Activities and results of the subgroup and individual rapporteurs are described in their reports. In spite of the fact that personal contacts among members and other experts are important for coordination of activities and effective work of the group, there were very few opportunity for it. Within limited financial resources of WMO, one meeting of core members was organized in March 2007 in Prague, in the middle of the intercessional period. Therefore all others opportunities were used for arrangement of meeting of people that were engaged in WGH topics of interest.

Relation to other WMO events and activities

During intercessional period, from the last WGH session in Prague 2005, following official session of WMO constitutional bodies were held:

- the 14th session of RA VI in September 2005 in Heidelberg (RA VI-XIV)
- the 58th session of Executive Council in June 2006 in Geneva (EC-LVIII)
- the 15th Congress of WMO in May 2007 in Geneva (Cg-XV)
- the 59th session of Executive Council in May 2007 in Geneva (EC-LIX)
- the 60th session of Executive Council in June 2008 in Geneva (EC-LX)
- the 13th session of Commission on Hydrology in November 2008 in Geneva (CHy-XIII)

Apart of the above mentioned session, several Technical conferences were organized by RA VI on regional level, such as TECO in Heidelberg 2005, Riga 2006, St Gallen 2007, Chisinau 2008. These conferences were orientated mainly on meteorological or cross-cutting aspects and probably not very attended by representatives of RA VI hydrological services.

The chairman of the group participated at the 58th and 60th sessions of EC and the 15th Congress as regional hydrological advisor of President of RA VI. During above mentioned sessions, the chairman promoted hydrological affairs in WMO and close cooperation on both professional and territorial level. It means cooperation of hydrological and meteorological services, mainly in countries where both services are institutionally separated, and cooperation in European international river basins and dealing with hydrological and water related problems in hydrological units.

Official WMO sessions, where permanent representatives were accompanied by their hydrological advisors, are usually a good opportunity for hydrological side meetings. During the 15th Congress in May 2007, a RA VI Hydrology Network meeting was organized by M. Puupponen, during the 13th CHy in November 2008 a meeting of attendees from RA VI countries was held. Those informal meetings facilitate personal contact among group members and other people from hydrological community, exchange of information and views, discussions on actual topics.

Linkage to the Commission of Hydrology

Contacts of the regional hydrological working groups to activities of CHy, that were not very intensive in past, are gradually improving in this intercessional period. The CHy itself works more efficiently after changes in its structure and programme in 2004. The CHy has usually world wide approach with respect to problems of developing countries and different natural conditions from RA VI. Nevertheless, for closer linkage and coordination of activities on both worldwide and regional levels, the CHy decided to invite chairmen of regional working groups to participate on regular sessions of the CHy Advisory Working Group. The first session of the enlarged CHy AWG was in February 2008, with aim to involve regional WGHs into preparing of the 13th CHy and its working plan for the next period.

The current CHy AWG consist of president, vice-president and 7 members, two of them are from RA VI countries. Mrs. Ann Calver (UK) is responsible for Water, Climate and Risk Management, Mrs. Zsuzsana Buzas (Hungary) is responsible for Quality Management Framework - standardisation in hydrology. The CHy vice-president J.Wellens-Mensah is commissioned for contacts with regional working groups. He attended also the last RA VI WGH session in 2005 in Prague.

In the process of its working plan preparation, the CHy AWG collected "regional needs" from chairmen of regional WGHs. Concerning regional needs in RA VI, after consulting with some core members, the chairman presented a list of regional needs that is in Annex II. The

list contains some issues that are considered as relevant in the next period and should be handled together with CHy. Regional needs should be addressed by CHy in its program of work for 2009-2012.

The CHy Programme of Work for 2009-12 has been developed in consultation with the RA WGHs and it is focused on the following theme areas:

Theme Area 1: Quality Management Framework – Hydrology (QMF-Hydrology)

Theme Area 2: Water Resources Assessment

Theme Area 3: Hydrological forecasting and prediction

Theme Area 4: Water, Climate and Risk Management

The CHy plans to continue in issuing guidance documents and providing expert support to improve a quality of basic functions of hydrological services. The new edition of the Guide to hydrological practices is in preparation and other manuals on specific hydrological activities as well. Effort is given to development and implementation of Quality Management Systems (QMS). The CHy considers to develop guidance material to assist NHSs in the development of their QMS.

RA VI Strategic Plan and Action Plan

Based on the WMO Strategic Plan, the 14th RA VI in Heidelberg decided, by its Resolution 22, to prepare the RA VI Strategic Plan (SP) for the enhancement of meteorological and hydrological services in the region in the period 2008-2011. The SP was prepared by the Task Team composed mainly by representatives of meteorological services from the region and WMO Regional Office for Europe. The chairman of RA VI WGH and regional hydrological advisor was only representative of hydrological community in the task team. He could check if statements on hydrological issues are properly formulated and in correspondence with interests of hydrological services. He also struggled, if possible, for relatively appropriate balance of meteorological and hydrological parts of the SP.

The draft of the SP was presented and discussed during TECO in Riga 2006, where only a few representatives of hydrological services participated. From this reason, the chair of the RA VI WGH, with support from secretariat and Regional office for Europe, organized a meeting of core members of the group in March 2007 in Prague. Seven core members, representative of Region office for Europe and three other members of the group attended the meeting. The main aim of the meeting was discussion on the first draft of RA VI SP and preparation of comments and proposal to it. As the meeting was organised just in the middle of the intercessional period, it provided a good opportunity to participants to inform themselves on activities of core members and Regional Office for Europe. Based on the RA VI SP, some adjustments of working plan of the group were adopted. Minutes from the meeting are in Annex III.

The SP specified top-level objectives, desired outcomes, strategic thrusts and expected results in the region. The basic segmentation was borrowed from the WMO Strategic Plan. As Strategic Thrusts, five items were defined:

Science and technology development and implementation

Service delivery

Partnership

Capacity building

Efficient management and good governance

In the structure of those Strategic Thrusts, 11 Expected Results were introduced (see Annex IV). Except of the first three results dealing with professionally oriented science and

technology (meteorology, climatology, hydrology), the others are oriented on cross-cutting activities without thematic specification. It seemed to be a good approach for activity planning and could be accepted by hydrologists. But later, the secretariat started to introduce this expected results principle as a basic approach to other WMO matters, as agenda of meetings or structure of working groups. This approach can bring a threat that hydrology, originally an integral discipline, will be diffused among common and universal activities.

The core members of the WGH on Prague meeting passed a judgement on above mentioned set of Expected Results and considered that, apart from Expected Result 3 – Enhanced capabilities for Members to provide more accurate hydrological forecasts and assessments, there are other Expected Results important for hydrological services and the WGH should be involved in. At the end, the core members meeting defined hydrological objectives under Expected Results 2, 3, 6, 7, 8 and 9, appointed responsible members for those objectives and adopted an adjusted working plan of the group as the first version of Action Plan (see Annex V).

Other activities

In Europe, main and most important linkage of WMO bodies are evidently to the European Commission (EC). Memorandum of understanding was signed between WMO and EC in December 2003 that contains priorities of common interest. Among those are:

- improvement of weather and hydrological forecast
- monitoring of the global hydrological cycle and its regional components
- hydrometeorological support for agriculture and food production
- hydrometeorological assistance for transport networks

In the framework of networking for contribution to regional initiatives related to water, a contribution of hydrological services to implementation of EU water legislation is the most relevant topic. Involvement of NHSs into the implementation process differs from country to country, depending on the responsibility of NHSs for different kind of monitoring. Apart from Directive 2000/60/EC establishing a framework for Community action in the field of water policy (Water Framework Directive), other directives were launched during the intercessional period. The RA VI WGH has his representative as observer in the Strategic Coordination Group for common implementation of EU water legislation (M.Puupponen) and also it has representatives in other working groups under CIS. Detailed information are given in the separate report by M.Puupponen on hydrology networking.

A new directive, closely linked to hydrology, is Directive 2007/60/EC on flood risk assessment and mitigation (Flood Directive). The Flood Directive is based on the principles that are convenient with Water Framework Directive, mainly introduces flood risk management based on international river basins, across administrative and political borders. Flood risk assessment and management is to be done in synergy with water management planning.

The European Flood Alert System (EFAS), developed and tested in the Institute of Environment and Sustainability of the EU Joint Research Centre (JRC) in Ispra, has been put into operation. Most hydrological services, mainly in the Elbe and Danube basins, are involved in the system as users of information and warnings issued by EFAS and they also provide data necessary for its development and operation. The present status and plan for further spreading of the system is in presentation given by JRC representative.

During the intercessional period, they were no direct contacts between the RA VI WGH and subsidiary bodies of UNESCO International Hydrological Program. Some hydrological services are involved in particular projects (eg. FRIEND), some NHSs are involved in the UNESCO project on regional cooperation in the Danube basin.

**PROGRAM OF WORK OF THE WORKING GROUP ON HYDROLOGY
IN PERIOD 2005-2009**

i. Public Relations and Visibility of Hydrological Services

Considering the need to enhance the visibility of the NHSs and the recognition of their role by national authorities, as well as their involvement in the formulation of new international policy tools concerning water:

- (a) To collect, analyse and disseminate information on the activities undertaken by NHSs in the area of public relations, and on tools and approaches used to enhance their visibility and recognition;
- (b) To develop RA VI Working Group on Hydrology Web site, with a link on WMO Web site, as an operational tool for the activities of the Working Group, in particular as concerns the exchange of information, the establishment of an address book, the publication of reports, the provision of links for the hydrological community; including in particular information on the current activities of the NHSs;
- (c) To formulate suggestions for the presentation to the public at large through communication media of daily hydrological bulletins and forecasts for a country or large river basins.

II. Networking for contributions to regional water related initiatives – in particular to the Water Framework Directive.

The objective of this proposal is to ensure relevant hydrological contribution for multidisciplinary regional water related programmes or initiatives. On the other hand, it should help National Hydrological Services to plan and adapt their long term activities. The main task is to develop working relationships and practices to facilitate this development.

- a) To organize a meeting of the representatives of the WMO, NHSs, DG Environment and EEA in connection with the RA VI meeting in September 2005. That meeting should cover an overview of the activities of the parties involved, the potential hydrological contributions of WMO and NHSs, and the future needs of DG Environment and EEA for hydrological services.
- b) As a follow-up of the above mentioned meeting, to define and implement, under the leadership of WMO, the necessary policy actions for NHS participation, e.g. formal cooperation agreements between WMO and EC.
- c) To develop and activate the network of NHSs to communicate, organize and manage activities.
- d) To attend or organize workshops involving the key parties for cooperation, and active participation. The Netherlands initiative for a conference on hydrological monitoring would serve as an important milestone for the process.

iii. Monitoring and Water Assessment (technical aspects)

Considering the present and anticipated responsibilities of the NHSs in the area of monitoring and water assessment in compliance with the EU Water Framework Directive (WFD):

- (a) To evaluate current methods used for the monitoring and assessment of the surface and ground water;

(b) To prepare a review of and proposals on:

Monitoring programmes in compliance with the WFD

Methods and criteria for the classification of the state of rivers and groundwater bodies

(c) To evaluate the influence of monitoring frequency on the assessment of surface and groundwater quality parameters.

iv. Climate and Water

Considering the potential impacts of climate variability and change on water resources, as well as uncertainties involved in assessing the impacts

(a) To study and report how scenarios provided by regional climate models should be presented to hydrologists and end users dealing with water management

(b) To study and report how assessments based on environmental simulation models and regional climate scenarios can be condensed and presented to the end-users in a readily comprehensible form

(c) To liaise with and receive feedback from those experts of the Association working on assessing the effects of climate change on water

v. Potential Extreme Floods

Considering the importance of hydrological design data for the safety of people and security of hydraulic structures (e.g. dams and bridges):

(a) To update a literature review of research carried out on hydrological design data for extreme floods occurrences;

(b) To continue a survey on best available practices and standards in estimation of hydrological design data for extreme floods occurrences, even in ungauged basins

(c) To carry out an investigation of methods of PMP/PMF derivation and other methods for extreme flood estimation;

(d) To liaise with experts and programmes on climate change and water with respect to their results concerning potential impacts on floods.

vi. Drought Assessment and Forecasting

In consideration of the increase of water-stress during a period of drought and with a view to ensuring the proper management of water resources during such conditions:

(a) To review and evaluate meteorological and hydrological forecasting systems in RA VI countries with respect to droughts occurrence;

(b) To assess the use of satellite data in drought monitoring, assessment and forecasting;

(c) To identify ways of promoting the exchange of data and products, as well as of forecasts and warnings, during low flow situations;

(d) To propose ways for ensuring effective cooperation with other international and regional bodies involved in drought assessment and mitigation;

(e) To review and evaluate activities undertaken by end-user, in cooperation with NHTs, to mitigate the impacts of drought;

vii. Subgroup on Flood Forecasting and Warning

The subgroup is considered to be composed from meteorologists and hydrologists with the aim to improve the capability of NMHSs in flood forecasting and warning for different types of floods:

- (a) To study and report the present applications of:
 - the development and operational use of common probabilistic methods
 - the development and operational use of ensemble forecasting
 - the development and operational use of methods for estimating, calculating the uncertainty in the forecasts
- (b) To promote co-operation between meteorologists, hydrologists and end-users, both in operational activities as well as in research and development
- (c) To co-operate with relevant actors in the area of flood forecasting and warning, mainly with respective member of CHy AWG on flood forecasting and with EU Expert Circle on Flood Forecasting (EXCIFF)

**Regional needs in the field of hydrology and water resources in RA VI
to be addressed to the CHy AWG in February 2008**

Theme Area	Activity	Comment
Climate change impact on hydrology and WR	To review results from research projects dealing with climate impact on water in different regions and prepare recommendation on their understanding and usage for hydrologists and end users dealing with water management	Impact on water sector given by changes of temperature and precipitation, and mainly in their extremes occurrence
non-stationary hydrological regime	To develop methodology and recommendation for hydrological design data estimation under global changes	Preparation of design data for the future, eg. 2050
Design flood estimation	To prepare recommendation on best practices and standards in estimation of design data for extreme flood events	Finishing the WMO Manual on Design Flood Estimation
Water resources assessment	To evaluate methods used for the assessment of the surface and ground water and recommend the standard methodology	Finishing of the WMO Manual on Water Resources Assessment
Hydrological Standardization	To reinforce cooperation with the International Standardization Organization (ISO) on international standards for hydrological observation and processing.	
Flash Flood Warning System	To consider realization of Flash Flood Guidance on global or regional levels	As help to regional implementation of the SAP for improved cooperation between NMSs and NHSs in flood forecasting
Environmental aspects of hydrology	To review and evaluate methods used for the assessment of ecological status of water and water bodies	Promote a role of WMO in environmental policy

WMO RAVI Working Group on Hydrology***Minutes of the Meeting of RA VI WGH core members*****Prague, Czech Hydrometeorological Institute
26-27 March 2007**

The meeting was organized upon recommendation from the WMO Regional Technical Conference on Strategic Planning in November 2006 in Riga. The main aims of the meeting were

- To inform the WGH on RA VI Strategic Plan and prepare comments and proposals to the second draft of the Plan
- To evaluate whether the hydrological issues are dealt with in the current RA VI Action Plan
- To formulate proposals for hydrological tasks for inclusion into the new RA VI Action Plan and reevaluate WGH working plan
- To inform on the activities of the WMO Regional Office for Europe
- To inform on the activities of core members of the WGH and discuss cooperation with European Community

The list of participants is at [Annex I](#). Participation of core members of the group was financially supported by the WMO Secretariat. Apart of participants, the following were invited and could not participate: Tommaso Abrate (WMO HWR department), Wellens Mensah (WMO CHy representative), Christophe Jacob (chief of Joint WMO/EUMETNET Office in Brussels).

1. Opening and introduction

The chairman of the WGH Mr Jan Kubát welcomed all participants on behalf of the Director of the Czech Hydrometeorological Institute (CHMI) Dr. Ivan Obrušník. He appreciated that a special meeting of the group could be held in the intersession and thanked to the RA VI Regional Office for its support. Mr. Kubát informed about present main activities of the CHMI in the field of hydrology. The institute is involved in the Water Framework Directive (WFD) implementation in the Czech Republic and in new monitoring programs according to the WFD. In this connection, the observing network of groundwater and surface water quality is undergoing rehabilitation through a project supported from the EU Cohesion Fund. The institute passed an external audit and will obtain ISO 9001 certification on quality management. The Hydrological Yearbook is regularly issued every year and it is available on WEB address www.chmi.cz.

2. Cooperation with European Union

The topic on cooperation with European Union (EU) was introduced by Mr Markku Puupponen, rapporteur on Networking for contributions to regional initiatives related to water. He informed that 22 European countries are currently involved in the network. The last meeting on networking was held in Geneva 26-27 October 2006. In particular, networking activities are focused on WFD implementation and increased involvement of NHSs in the process. The EU Common Implementation Strategy (CIS) has adopted the fourth work programme for 2007-2009. In the programme the role of hydrology is recognized and the hydrological community has representatives in all CIS working group, as follows:

Strategic Coordination Group – M. Puupponen (Finnish Environmental institute) as observer

WG on Reporting – R. Busskamp (German Federal Hydrological Institute)

WG on Groundwater – E. Kullman (Slovakia)

Water scarcity and droughts forum – G. Monacelli (Italian Agency for Environmental protection)

WG on Floods (newly established) – B. Ozga-Zielinski (Polish Institute of Meteorology and Water Management) , I. Karro (Swedish Meteorological and Hydrological institute)

The next meeting on Networking is planned in Geneva 14 of May as side meeting during the 15th WMO Congress.

Mr. Ch. Jacob was consulted during the meeting by phone and he promised his support to the Networking and his participation in the May meeting in Geneva.

3. EIONET – Water

Data on water quantity are collected annually through the Eionet-Water by the European Topic Centre on Water (UK). European Environment Agency member countries are asked to provide water quantity data according to criteria described in the technical guidelines (EEA Technical Report No.99). Up to now most of NHSs provide data but are not involved in the formulation of data policy. The following activities are proposed from discussion:

- to deal with standardization of hydrological data (provided by NHSs for EIONet, GRDC and other purposes)
 - to contact WMO Regional Instrument Centre in Bratislava with request on considering hydrometric instruments as well meteorological ones

4. RA VI Strategic Plan

The RA VI Strategic Plan (SP) was introduced by Mr Dusan Hrcek, WMO representative for Europe. He informed about a new WMO department for Development Cooperation and Regional Activities (DCR), lead by prof. Petteri Taalas, that coordinates and supports regional activities in WMO. In this department Mr Hrcek serves also as focal point for cooperation with EU.

The RA VI Regional Strategic Plan is being prepared according to the Resolution 22 of the 14th RA VI session held in 2005 in Heidelberg (Germany). The SP for enhancement of NMHSs in the region shall be in line with WMO Strategic Plan 2008-2011 and shall substitute the current WMO long-term planning. The Task Team for preparing the RA VI SP was established in Heidelberg and composed from representatives of 6 countries. They prepared the first draft of the SP, that was submitted to members and discussed at the Regional Technical Conference on strategic planning in November 2006 in Riga., The second draft of the SP incorporating proposals and comments from the conference is submitted to members and working groups are invited to discuss it and provide their comments and proposals. The final draft is intended to be presented at the 15th WMO Congress.

The members of the WGH reviewed in detail the second draft of the SP (Version 0.5). Based on the discussion during the meeting, they prepared comments which are reported in Annex II. The general recommendation from the meeting is that the SP should more emphasize the need of cooperation among the various RA VI working groups and of regional working groups with WMO technical commissions. The WGH also pointed out to importance of personal contact among members and recommended that at least two meeting of the group should be held in the period between RA VI sessions.

The WGH reviewed the proposed system of performance indicators and targets (on page 23 of the SP draft), and found it that is too complicated and administratively demanding and not suitable for assessing the performances of NHSs. The chairman of the group will submit these comments to the RA VI Task Team.

5. RA VI Action Plan

The current Action Plan is a part of the Resolution 22 from RA VI-XIV (Heidelberg, Germany, 2005). It contains 9 strategic topics and together 50 objectives. The WGH is responsible for two of them only:

1.6 Review the needs and capabilities for flood forecasting within the region – in association with subgroup on Data Processing and Forecasting Systems (DPFS)

6.7 Coordinate the development and implementation of a trans-boundary hydrological observing systems for real time flood forecasting and water resource assessment

Both objectives are monitored as to be on track and will be reflected into the new AP for 2008-2011.

The WGH reviewed its current working plan in consideration with the RA VI SP draft and suggested several new objectives into the RA VI Action Plan (see Annex III). The list of objectives forms a new working plan of the WGH for the period given by the AP. The RA VI AP 2008-11 contains now 12 objectives under responsibility of the WGH. For every objective (topic) a responsible core member of the group is determined. Evaluation of the AP and prospective adjustment will be done at the next session of the WGH in 2009.

6. Others

The next meeting of the WGH is considered in April 2009 in Toulouse (France)

In the framework of the meeting a field trip for some participants was organized on 28 March. A new CHMI automated station for water quality and floating sediment measurement in Srbsko (Berounka River) was presented and also hydrometric measurement of discharges with ADCP flowmeter.

Expected Results of WMO

▶ Science and Technology Development and Implementation
▶ I. Enhanced capabilities for Members to produce more accurate weather forecasts and warnings
▶ II. Enhanced capabilities for Members to provide more accurate climate predictions and assessments
▶ III. Enhanced capabilities for Members to provide more accurate hydrological forecasts and assessments
▶ IV. Integration of WMO observing systems
▶ V. Development and implementation of the new WMO information system
▶ Service Delivery
▶ VI. Enhanced capabilities of Members in multi-hazard early warning and disaster preparedness
▶ VII. Enhanced capabilities for Members to provide and use weather, climate, water and environmental applications and services
▶ Partnership
▶ VIII. Broader use of weather, climate and water outputs for decision-making and implementation by Members and partner organizations
▶ Capacity Building
▶ IX. Enhanced capabilities of NMHSs in developing countries, particularly LDCs, to fulfill their mandates on weather, climate and water
▶ Efficient Management and Good Governance
▶ X. Effective and efficient functioning of constituent bodies
▶ XI. Effective and efficient management performance and oversight of the Organization

WMO RAVI Working Group on Hydrology

RA VI Action Plan 2008-11 – hydrological part

The Action Plan for RA VI is based around the Expected Results from the RA VI Strategic Plan. The suggested hydrological tasks are based on the structure of the WGH and its working programme agreed at XIV-RA VI, but these may change at XV-RA VI in order to have the most effective structure to implement the Strategic Plan.

Expected Result 1: Enhanced capabilities for Members to produce more accurate weather forecasts and warnings;

No hydrological objectives

Expected Result 2: Enhanced capabilities for Members to provide more accurate climate predictions and assessments;

Objective	Responsible group
To review climate change scenarios and results from research projects dealing with climate impact on water in Europe and prepare recommendation on their presentation and usage for hydrologists and end users dealing with water management (2009) cfr XIV-RA VI Res 17 Annex, point IV (a)	WGH T.Kokkonen

Expected Result 3: Enhanced capabilities for Members to provide more accurate hydrological forecasts and assessments;

Objective	Responsible group
Review of operational forecasting methods and development targets in the region including existing cooperation between NMHSs within trans-boundary river basins (2009). cfr XIV-RA VI Res 17 Annex, point VII (a)	WGH - SG FFW I.Karro
To facilitate activities of NHSs in the region for improvement of hydrological forecasting including regional initiatives (European Flood Alert System - EFAS, European eXchange Circle on Flood Forecasting - EXCIFF etc.). To cooperate with European Commission on mechanism for the future implementation of EFAS including the system of relevant data exchange (2009).	WGH - SG FFW I.Karro In cooperation with M. Puupponen

To evaluate current methods used for the assessment of the surface and ground water in the region taking into account the preparation of CHy Manual for water resources assessment (by 2009) cfr XIV-RA VI Res 17 Annex, point III (a)	WGH V.Vuglinsky
To prepare recommendation on best practices for flood monitoring, early warning and protection systems on local, national and international level (2009)	WGH B.Ozga-Zielinski
To prepare recommendation on best practices and standards in estimation of design data for extreme flood events (2011) cfr XIV-RA VI Res 17 Annex, point V (a)	WGH B.Ozga-Zielinski
To review meteorological and hydrological forecasting systems and use of satellite data in the region with respect to hydrological consequences of droughts (2009) cfr XIV-RA VI Res 17 Annex, point VII (a) and (b)	WGH G.Monacelli

Expected Result 4: Integration of WMO observing systems;

No hydrological objectives

Expected Result 5: Development and implementation of the new WMO information system;

No hydrological objectives

Expected Result 6: Enhanced capabilities of Members in multi-hazard early warning and disaster preparedness;

Objective	Responsible group
To cooperate with WMO DPM on promoting early warning, alarm and disaster preparedness systems which require meteorological and hydrological collaboration (2009).	WGH J-M.Tanguy
Regarding the development of a multi-hazard warning system, propose ways to improve the integration between meteorology, hydrology and climate change impacts with regards to extreme events such as floods and droughts, and mechanisms to promote the use of the WMO operational infrastructure within the region with the EU and other relevant organizations. Assess current requirements and capabilities within the region and propose how to improve and develop the system, including linking with other relevant organizations as appropriate, to include non-hydrometeorological warnings.	RA VI WG DPM in cooperation with other WGs and subgroups as appropriate <u>WGH is ready to cooperate</u>

Expected Result 7: Enhanced capabilities for Members to provide and use weather, climate, water and environmental applications and services;

Objective	Responsible group
To develop a RA VI Working Group on Hydrology Web site, with a link on the WMO Web site, as an operational tool for the exchange of information, the provision of links for the hydrological community (before next RAVI meeting in 2009). To publish there a overview	WGH M.Simota

catalogue of hydrological outputs with recommendation of their use by different end-users (by 2011). cfr XIV-RA VI Res 17 Annex, point I (b)	
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Expected Result 8: Broader use of weather, climate and water outputs for decision-making and implementation by Members and partner organizations;

Objective	Responsible group
To provide hydrological contribution for the implementation of EU water related directives and to take care of hydrological aspects in European environmental data policy (WMO and Water Information System Europe - WISE). By 2009/2011. cfr XIV-RA VI Res 17 Annex, point II (a)	WGH M.Puupponen

Expected Result 9: Enhanced capabilities of NMHSs in developing countries, particularly LDCs, to fulfill their mandates on weather, climate and water;

Objective	Responsible group
To share training knowledge and practices on operational hydrology To ensure link with existing hydrological resources in EUMETNET and to inform hydrological community about available training programs trough web page.	WGH J-M.Tanguy

Expected Result 10: Effective and efficient functioning of constituent bodies;

No hydrological objectives

Expected Result 11: Effective and efficient management performance and oversight of the Organization.

No hydrological objectives

Objectives that don't fit neatly under the Expected Results

Objective	Responsible group
Liaison of working groups with respective Technical Commissions as appropriate (ongoing)	WGH and others
Cooperation among WG on cross cutting issues in the region (ongoing)	All WG
To initiate joint effort with the International Standardization Organization (ISO) and Centre European de Normalization (CEN) on international standards for hydrological observation and processing.	WGH Z.Buzas
To propose and to plan regional conference and workshop on hydrological topic with WMO support (ongoing).	WGH J.Kubat