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WEATHER, CLIMATE AND WATER**

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**HYDROLOGY AND WATER RESOURCES PROGRAMME (HWRP) – REGIONAL
ASPECTS**

(Submitted by the Secretariat)

Summary and purpose of the document

This document provides consolidated information on the Hydrology and Water Resources Programme and its regional aspects in RA VI and, where appropriate, contains proposals for action to be undertaken by the Working Group on Hydrology

1. OPENING OF THE MEETING

1.1 The session will open at 9.15 a.m on Wednesday 25 March 2009 in the Centre International des Conférences in Toulouse, France

1.2 This document provides information on aspects of the WMO's Hydrology and Water Resources Programme (HWRP) of relevance to the RA VI Working Group on Hydrology. Additional information is provided in the annexes to the document. Hereafter, the titles of the sections of this document correspond to those of the provisional agenda (see RA VI-WGH/Doc. 1).

2. APPROVAL OF THE AGENDA AND ORGANIZATION OF THE WORK

2.1 The meeting will adopt its agenda (see provisional agenda RA VI-WGH/Doc. 1) and decide upon its schedule of work.

2.2 In accordance with Reg. 42 of the WMO General Regulations, the meeting shall be informed that the recommendation of the working group "shall have no status within the organization until they have been approved by the responsible constituent body", that is, in this case, the Regional Association RA VI.

3. CONSIDERATION OF THE RELEVANT DECISIONS OF Cg-XV, XIII-RA VI, CHy-XIII, EC-LIV, EC LV AND EC-LVI

Fourteenth Session of the Regional Association VI

3.1 The fourteenth session of the Regional Association VI was held in Heidelberg, Germany, from 7 to 15 September 2005 (see reference 2). There were 129 participants in the session, representing 45 Members of the Association; as well as two representatives of other WMO members and 11 representatives of other IGOs and NGOs.

3.2 As it concerns the implementation of the Hydrology and Water Resources Programme (HWRP) the Association noting that in the past Members from the Region had been very active in supplying components to HOMs, invited them to renew their commitment with a view to improving on components of particular interest in RA VI.

3.3 The Association noted with satisfaction the cooperation established between the WGH, the European Commission Strategic Cooperation Group on Common Implementation of the Water Framework Directive, and the European Environment Agency (EEA). The Association encouraged Members to continue and strengthen cooperation with the European Commission in other fields of common interest such as in the preparation of the groundwater and flood directives, the European Union Action Plan on Risk Management and the European Flood Alert System (EFAS).

3.4 The Association considered that the particular issues of interest to the Region were:

- (a) Strengthening the activities of WMO and NMHSs to work with partners (such as the civil defense/disaster preparedness community) in dealing with natural disasters and poverty;
- (b) Closer partnership with the EU and other regional organizations on early warning systems;
- (c) Integration of NMHSs' contribution to sustainable development;
- (d) Bridging the gap in the level of services among NMHSs through capacity-building of human resources and institutional development;
- (e) Promotion of cooperation with NMHSs in other Regions;

3.5 The Association recognized the need to develop the Regional Strategic Plan for the Enhancement of NMHS in RA VI. It aimed at strengthening the capabilities of the NMHSs in RA VI to provide appropriate meteorological, hydrological and related services, highlighting the important role of WMO and its Members in the prevention and mitigation of natural disasters, the protection of life and property, safeguarding the environment and contributing to sustainable development. More detail on the Strategic Plan are reported in paragraph 6.1

Fifteenth World Meteorological Congress

3.6 The fifteenth World Meteorological Congress (Cg-XV) met in Geneva from 7 to 25 May 2007. The Congress recognized that Regional Working Group on Hydrology formed one of the strong mechanisms to liaise with regional hydrological communities and interpret their needs and requirements; it also recognized the declining level of support to their activities and the need to strengthen this support.

3.7 Congress appreciated that, in an effort to optimize resources, CHy at its twelfth session (2004) had decided to establish only an Advisory Working Group of nine members and created five Open Panels of CHy Experts to enable greater involvement of national specialists and professionals in support of CHy activities. It also recognized that, being many of the Millennium Development Goals (MDG) closely related to water themes, water sector in a broad sense represents a major area in WMO contribution to MDG. It also noted that, in the framework of the simplification of the structure of the Hydrology and Water Resources Programme in the current financial period, the Commission had proposed to suppress the programme on Sustainable Development of Water Resources and redistribute its activities to other subprogrammes of the Hydrology and Water Resources Programme.

3.8 The Congress also expressed its concern that the increase of requests for support to projects on Hydrology and Water Resources in the framework of the Voluntary Cooperation Programme was not matched by a similar increase in the resources made available for their implementation; it encouraged Members to increase their support to these projects. The Congress however appreciated the efforts done to raise extra-budgetary funds for the implementation of various WHYCOS components and invited Member and regional institutions to collaborate with the Secretariat to secure funds required for the implementation of HYCOS proposal still awaiting support.

3.9 Congress appreciated the general approach of the Strategy on Education and Training in Hydrology and Water Resources that, without forgetting the core business of National Hydrological Services (courses on maintenance of automatic stations, rating curves, hydrometry and topography), tried to encompass more general topics (management techniques described in the Guidelines on the Role, Operation and Management of National Hydrological Services, courses on Integrated Flood Management, Integrated Water Resources Management and Water Affairs) to respond to the new responsibilities assigned to NMHSs in recent times by their governments.

3.10 The Congress supported the proposed principle, subsequently adopted by the Commission that Quality Management Framework (QMF) should concentrate on the activities of NHSs and therefore, in addition to the improvement of the administrative and managerial aspects included in a quality management system, emphasis should also be given to the development of standards and recommended practices. Congress encouraged Members who had completed the implementation of a Quality Management Systems (QMS) to provide support to other Members in form of hosting lectures, training seminars, visits, etc. to better understand how successful QMS were implemented. Congress adopted Res 31 (Cg-XV) - Implementation of quality management systems by National Meteorological and Hydrological Services. In Congress view QMF should not only address the implementation of quality management systems by its Members, but also provide an overall strategy for WMO

covering all relevant WMO technical programme activities. In this connection Congress agreed that a dedicated volume of the Technical Regulations (Volume IV, "Quality Management") needed to be developed.

3.11 Congress highlighted the importance of strengthening the international recognition of WMO standards, including WMO regulatory documents, as it was of utmost importance that they were widely recognized and used as reference standards. WMO and the International Organization for Standardization (ISO) entered in September 2008 a working arrangement aimed to strengthen the development of International Standards and to avoid duplication of work on standards related to meteorological, climatological, hydrological, marine and related environmental data, products and services. WMO and ISO will develop, approve and publish common standards based on WMO technical regulations, manuals and guides and relevant WMO documents will be adopted by ISO as ISO standards.

Sessions of the Executive Council

3.12 EC-LVII, which met in June 2005, recognizing the importance of water issues, observed that more time should be assigned for discussing the Hydrology and Water Resources Programme in WMO constituent bodies in the future. It also endorsed through its Resolution 5 the participation of WMO in the International Flood Initiative. The Council also adopted a "Statement on the role and operation of national meteorological and hydrological services (for decision makers)" and recommended that QMF aspects should become an integral part of the work of the technical commissions;

3.13 EC-LVIII, held in Geneva in June 2006 discussed a number of issues of direct relevance to CHy. In particular the Council expressed support to the proposal to have WMO Regional Training Centres (RTCs) in a range of disciplines in lieu of more narrow-scoped WMO Regional Meteorological Training Centres. The process of establishing new Centres will include endorsement by the regional association, the technical commission concerned and by the WMO Secretariat; approval by the Executive Council; and the signing of an Agreement between the host country and WMO. The Council also included representatives from the Commission for Hydrology on a number of key planning groups of the EC which were to provide significant input to Congress, including the Strategic Plan and budgets.

3.14 EC-LIX was a short meeting following Cg-XV and no matters of significance were raised.

3.15 The EC LX in 2008 was the first in which the organization of the discussion was geared to WMO Expected Results according to the Strategic Plan and Result Bases Budgeting principles. At EC-LX the matters of relevance to CHy raised included:

- The need to describe and promote the Future Work Programme for CHy under the Expected Results framework;
- The need to develop a possible mechanism for greater involvement of developing countries in the work programmes of the Commissions.;
- Agreement to some actions that will improve coordination and cooperation between WMO and UNESCO in hydrology and water resources; and
- The review of the role and functioning of the technical commissions.

3.16 The Council underlined that the continuous improvement of flash flood warning and medium-range forecasting of floods of extended dimension was fundamental for implementing emergency response of the civil protection authorities. Reviewing HOMS to adapt it to the needs of the Quality Management Framework–Hydrology it encouraged the Commission to devise mechanisms by which a greater number of new components could be obtained and relevant technologies disseminated to interested NMHSs. The Council urged Members to

support the hydrological data rescue activity, including experimental data, which were fundamental for trend analysis and understanding the effects of climate change.

3.17 The Council agreed to strengthen and promote linkages between climate, weather, water and environmental prediction and research, through the development and implementation of an Enhanced Climate, Weather, Water and Environmental Prediction Framework. To support such Framework the Council established a Task Team on Research Aspects of an Enhanced Climate, Weather, Water and Environmental Prediction Framework (Research Team) whose main task was to propose a strategy focusing on strengthening prediction research and related scientific assessments in support of enhanced climate, weather, water and environmental services in the next decade.

Thirteenth Session of the Commission for Hydrology

3.18 The Thirteenth session of the Commission for Hydrology was held in Geneva from 4 to 12 November 2008. It was attended by 117 delegates from 52 countries representing National Hydrological and Meteorological services as well as by representatives of 14 International Organizations.

3.19 The Commission decided to adopt the following four thematic as a priority for its work in the next intersessional period, and developed corresponding sets of activities and expected outputs and outcomes for each theme area:

1. Quality Management Framework – Hydrology (QMF–Hydrology)
2. Water Resources Assessment
3. Hydrological Forecasting and Prediction
4. Water, Climate and Risk Management

3.20 The Commission for Hydrology unanimously re-elected Mr Bruce Stewart (Australia) president and Mr Julius Wellens-Mensah (Ghana) vice-president for the next intersessional period. The Commission also nominated an Advisory Working Group (AWG) composed of the members listed below (with indication of the relevant area of responsibility) :

- Mr Harry Lins (USA) Quality Management Framework Hydrology
- Ms Zsuzsanna Buzás (Hungary) Quality Management Framework Hydrology
- Ms Jeanne Balonishnikova (Russian Federation) Water Resources Assessment
- Mr Zhiyu Liu (China) Hydrological Forecasting and Prediction
- Mr Guido van Langenhove (Namibia) Hydrological Forecasting and Prediction
- Ms Ann Calver (United Kingdom) Water Climate and Risk Management
- Mr Antônio Cardoso (Brazil) WIGOS and WIS

The Commission re-established the existing OPACHes and urged Members to nominate additional experts to OPACHes and to facilitate the voluntary contribution of all members of the OPACHes to the activities of the Commission.

Adoption of Quality Management Framework for Hydrology

3.20 The Commission adopted the Quality Management Framework – Hydrology with the goal of providing an overall strategy, advice and guidance tools for NHS to attain efficiency, quality and effectiveness in their functioning. The QMF-Hydrology is integrant part of the overall WMO QMF. This would include:

- Documentation on approaches to QMS and guidance on its adoption and implementation, including guidance on documenting procedures used by a NHS and documentation of the attributes of the products that the NHS produces including its level of quality;
- Documentation and guidance on management of NHSs, for example, Guidelines on the Role, Operation and Management of National Hydrological Services (WMO Operational Hydrology Report No. 49, WMO-No, 1003);

- Documentation on technical approaches for the provision of hydrological data, products and services;
- Development of training modules and materials.

3.21 CHy would undertake to develop the required guidance documents, making use of the best technical practices and approaches developed by other organizations. In particular, within the framework of the working agreement with the International Organization for Standardization (ISO), joint standards would be prepared. The Commission also urged its Members to become engaged with ISO national counterpart agencies for the development of standards of importance to NHSs.

3.22 With the adoption of a QMF-Hydrology, the publications brought out under the technical guidance of the Commission should undergo a comprehensive peer review before they were recommended for adoption as tools for the QMS. Therefore, the Commission adopted an updated peer review process for these publications which has been further detailed by AWG at its first meeting in February 2009.

3.23 The AWG, while discussing the finalization of the “WMO statement on the scientific basis for, and limitations of, river discharge and stage forecasting”, requested that the statement be placed on the e-board and opened for e-discussions through the Forum as soon as possible. Members of CHy and other experts should be informed through e-mails of the e-discussions and be invited to provide comments and inputs.

Assessment of the Performance of Flow Measurement Equipment

3.24 This activities stems from a decision taken by the previous session of the Commission, by its resolution 1 (CHy-XII). The thirteenth session of the Commission approved the rationale and the work plan for the project. The project would encourage and solicit testing by contributing NHSs of the newer instrumentation and methodologies. Six are its expected outcomes: i) a summary of the field discharge measurement instrumentation and techniques, ii) collection of international and national standards and guidelines, iii) a framework for the assessment of uncertainties in discharge measurement, iv) guidelines for conducting and reporting results of instrument calibration, v) collection of test reports, and vi) the creation of a website to disseminate the above results, available on line since august 2008 (<http://www.wmo.int/pages/prog/hwrrp/FlowMeasurement.html>).

3.25 The project will be provided overall guidance by the CHy Advisory Working Group in its capacity as project Steering Committee. Day-to-day implementation will be overviewed by a Management Committee composed by a representative each of the AWG, Regional Working Groups on hydrology, IAHR, IAHS, ISO and HMEI. Ms Zs. Buzás (Hungary) has been appointed as representative of the WGH in the management committee. It was also decided to involve other technical commissions, such as CIMO, and external organizations, such as the International Association of Hydraulic Engineering and Research, International Association of Hydrological Sciences, International Organization for Standardization and Association of Hydro-Meteorological Equipment Industry, in the project.

Hydrological Forecasting and Flood Management

3.26 WMO has been implementing since 2003 the Flood Forecasting Initiative (FFI) with the goal to improve the capacity of meteorological and hydrological services to jointly deliver timely and more accurate products and services required in flood forecasting and warning and in collaborating with disaster managers, active in flood emergency preparedness and response.

3.27 In the framework of the implementation of this initiative a number of regional workshops have been organized bringing together forecaster in hydrology and meteorology as well as

representatives of the academia, to discuss the present status, shortcomings and perspectives of flood forecasting in the various WMO regions. Two of such workshops were held in Europe one in Bratislava (Slovakia) in 2005 for the central and eastern European countries, the other in Zaragoza (Spain) in 2006 for the countries of the Mediterranean rim.

3.28 The conclusions and recommendations of all these regional workshops constituted the basic input to a global Synthesis Conference held in 2006 which produced a “Strategy and action plan for the enhancement of cooperation between national meteorological and hydrological services for improved flood forecasting” (<http://www.wmo.int/pages/prog/hwrrp/documents/FFInitiativePlan.pdf>). The Commission decided to supplement the Strategy and Action Plan on the FFI with a detailed activity plan that will assist Members in establishing flood forecasting systems and that will be developed by the Advisory Working Group (AWG), and to explore the possibility of establishing an Inter-Commission Task Team comprising of representatives of CHy, CBS, CCI and CIMO for the implementation of the FFI.

3.29 As a follow-up to Resolution 21 (Cg-XV) – Strategy for the Enhancement of Cooperation between National Meteorological and National Hydrological Services for improved flood forecasting and in cooperation with the USA National Oceanic and Atmospheric Administration (NOAA) and the Hydrologic Research Centre in San Diego, a Flash Flood Guidance System (FFGS) is being developed with plans to implement regional components. Diagnostic indices known as flash flood guidance (defined as the amount of rainfall of a given duration over a small basin needed to create minor flooding (bankfull) conditions at the outlet of the basin) are calculated that are used to evaluate the potential for flash flooding. Negotiations are at present at an early stage with USAID to explore the feasibility of a component involving RA VI countries, focused on south-east Europe and the Middle East.

3.30 The AWG also considered that an overview management mechanism for all the activities under flood forecasting should also be established. Adopting this concept, an Advisory Group on Flood Forecasting could be established consisting of a number of core members including the two AWG members responsible for Theme Area 3 (Hydrological Forecasting and Prediction) and representatives from the principal donors; technical cooperation partner(s); Commission of Basic System; and project managers of FFGS regional projects.

3.31 The Commission also saw merit in closely collaborating with CAgM and CCI to work towards developing tools and best practices guidance for hydrological drought monitoring and prediction.

3.32 The Commission also decided to assist in the setting up of a HelpDesk for Integrated Flood Management for the benefit of Members in the areas of flood management policy and strategy, and capacity building in support thereof

Climate and Water issues

3.33 The Commission decided to actively participate in the development of the WMO Initiative to encourage provision and dissemination of climate and hydrological information in support of hydrology and climate research, adaptation to climate change and climate variability and in providing feedback from the water community. The Commission called upon its Members to provide tools, mechanisms technologies and know-how related to hydrological impacts of climate change and variability, including extreme events, and share them among all members through HOMS

3.34 CHy-XIII also recognized the complementary nature of the water tasks of GEO to the activities undertaken by the Commission and decided that the collaboration between CHy

and the water tasks of GEO should be largely facilitated through the Integrated Global Water Cycle Observations (IGWCO) theme, the Secretariat of which is being co-hosted by WMO. In this regard, it should also be noted that the Global Terrestrial Network – Hydrology (GTN-H) that is being jointly operated by CLW and GCOS, provides services as the observations and integration component of IGWCO.

3.35 WMO participated in the 5th World Water Forum (Istanbul, Turkey, from 16 to 23 March 2009) by co-organizing two technical sessions on "Managing Water-related Risks in a Changing Climate" and "Data for All". In an effort to raise the visibility of WMO and its Members, several stands in the World Water Expo and the UN Water Pavilion were used to disseminate various WMO and related materials in collaboration with the Turkish State Meteorological Service.

3.36 WMO is organizing from to the World Climate Conference-3 (WCC-3) with the aim to establish an international framework to guide the development of climate services which will link science-based climate predictions and information with climate-risk management and adaptation to climate variability and change throughout the world. The expected outcomes of WCC-3 are global actions to enhance the ability to provide climate prediction and information services, together with their integration in decision-making in support of disaster risk reduction, socio-economic development and initiatives for adaptation to climate variability and change. This will be achieved through a clear and actionable ministerial declaration followed by an action plan and timeframe with specific, achievable and measurable goals

INFOHYDRO

3.37 The Commission at its twelfth session had noted the growing concern among the various international agencies and institutions about the lack of information on the status of the hydrological networks. Responding to that need, the Commission for Hydrology had developed a simplified Hydrological Information Referral Service (INFOHYDRO) questionnaire for a survey of national agencies dealing with hydrological measurements, their activities, networks and related metadata. After a test run conducted in English, the INFOHYDRO questionnaire had been translated into French, Russian and Spanish and circulated to all Members in July 2007 at present only 34 countries (17 from region VI) have provided information to the INFOHYDRO data bank. CHy XIII urged Members to make special efforts to complete the information required in the INFOHYDRO, as only the comparison of a reasonably wide spectrum of responses covering NHSs from all WMO Regions and at different levels of development would contribute to a correct assessment of the status of hydrological networks around the world and support advocacy efforts for their strengthening. A set of definitions, meant to clarify the terminology used in the questionnaire to facilitate NHSs in filling it are currently being developed by the Commission vice-president.

Capacity building

3.38 The Commission revised the WMO Strategy on Education and Training in Hydrology and Water Resources, and decided that it should guide the activities of the Organization in this area for the period 2009-2012. The strategy objectives are i) assist Members in assessing their own education and training need in Hydrology and Water Resources, ii) provide adequate education and training to personnel of NHSs, iii) assist Members in developing or updating national curricula in Hydrology and Water Resources and iv) optimize the use of available resources and mobilize extrabudgetary resources. The strategy addresses as primary target group technical and professional staff of NHSs, with special focus on the NHSs of developing countries, and as a secondary group academia and other governmental agencies. Education and training activities supported by WMO should be in principle demand-driven and based on the inputs from Members, Regional Working Group on Hydrology and surveys. Emphasis will be placed on short-duration, low-cost and high-impact activities such as training of trainers and roving seminars.. Particular attention will be also given to distance and blended learning and to

the promotion of the *Guidelines for the Education and Training of Personnel in meteorology and Operational Hydrology* (WMO No. 258) Vol. II – Hydrology.

HOMS

3.39 The Commission recognized that HOMS mission and objectives, as presented in the HOMS plan for the XXI century are still valid and relevant. However it expressed its concern in relation to the lack of updating of the existing components and the minimal contribution of new ones during the last decade. It recognized that this was due to the reduction of staff dedicated to international cooperation activities in the NHSs which were traditionally major suppliers of HOMS components and by the advent of Internet which has made easier both the dissemination and the search of pieces of technology.

3.40 However the Commission wished to retain the positive aspects of HOMS, such as: a) the reputation of reliability of HOMS components derived from their proven operational value, which is often missing in material found on the Internet and b) the network of national and regional HOMS focal points. It developed Alternative Approaches to the future of HOMS proposing to change the name in order to reflect the programme main purpose of Technology Transfer in Hydrology and Water Resources, to maintain and possibly further develop the present on line version and to create a repository of components no longer supported by the providers in order to ensure that they are not completely lost.

ACTION PROPOSED

The meeting is invited to note the information above and take it into account, as appropriate, in discussing the other agenda items. In particular the meeting is expected to provide inputs on the Region's potential contribution to the implementation of the Strategy on education and training, and on the identification of Regional Training centres on hydrology, b) to the development of QMF and of standards in hydrology and water related matters, c) in the strengthening of HOMS and INFOHYDRO.

4. REPORT OF THE CHAIRMAN OF THE WORKING GROUP

4.1 The Chairman will report on the progress made regarding the tasks assigned to him and to the rapporteurs of the Working Group. He will also report on his activities as Regional hydrological Adviser to the President of RA VI and on his participation to the sessions of the Executive Council.

ACTION PROPOSED

The meeting is invited consider the information provided in the chairman's report and give specific proposals on ways of ensuring successful completion of the work of the Group. The proposals could be considered as an input to the discussion under agenda item 7

5. CONSIDERATION OF THE ACTIVITIES OF THE RAPORTEURS OF THE WORKING GROUP

5.1 By its Resolution 17 (XIV-RA VI), the Regional Association established a Working Group on Hydrology under the chairmanship of Mr J. Kubát (Czech Republic) and assigned to it a number of specific tasks to be carried out during the period 2005-2009. To carry out these tasks the Association nominated six rapporteurs:

- Ms I. Simota (Romania) as expert on Public Relations and Visibility of Hydrological Services
- Mr M. Puupponen (Finland) as expert on Networking for contribution to regional initiatives related to water

- Mr T. Kokkonen (Finland) as expert on Climate and Water
- Mr V. Vuglinsky (Russian federation) as expert on Water Monitoring and Assessment
- Mr B. Ozga-Zielinski (Poland) as expert on Potential Extreme Floods
- Ms G. Monacelli (Italy) as expert on Drought Assessment and Forecasting.

and established one sub-group on Flood Forecasting and Warning, chaired by Mr I. Karro (Sweden)

ACTION PROPOSED

The Working Group is invited to consider the draft reports presented by the rapporteurs and chairmen of the Sub-groups, and to provide comments so as to assist them in finalizing their respective reports. The discussion will also serve as input to the preparation of the future work plan, to be discussed under agenda item 7.

6. DISCUSSION ON THE IMPLEMENTATION OF THE HYDROLOGY AND WATER RESOURCES PROGRAMME IN RELATION TO THE NEEDS OF THE REGION

RA VI Strategic Plan

6.1 The Commission for Hydrology at its thirteen session recommended that views of the hydrological community should be incorporated while developing Strategic Plans for RAs. It encouraged the WMO hydrological community to take every opportunity to provide prioritized proposals and suggestions to the formulation of the Strategic Plan for the period 2012-2015, for example through the deliberations of other WMO bodies such as Regional Working Groups on Hydrology and Water Resources and Regional Associations.

6.2 The strategic plan (2008-2012) of RAVI has been developed pursuant Res 22 (XIV RA VI). In reviewing the needs and priorities of the region it gives due recognition the hydrological and water related aspects, however primarily when they are somehow linked to meteorological phenomena; floods and drought are listed respectively first and second in the list of natural disasters affecting the Region. The implementation of the Strategic Plan is expected to bring, among others, increased preparedness to meet concerns including: warning of high impacts events, climate and water conditions, climate change and water management.

6.3 Among the strategic thrusts the highest relevance is given to Service delivery, such as early warning of extreme phenomena (also in relation to their change on frequency due to climate change) or more comprehensive services related to water resources. However no explicit mention is done of the potential impact of climate change on water management. The development of coordinated cross boundary flood warning and alert systems and the implementation of Quality Management Systems in NMHSs are among the expected results.

6.4 As it regards Science and Technology the expected results are linked to data availability, state-of-the-art methodologies and tools for NMHSs, capacity building for hydrological forecasting and analysis. Partnership with sub-regional networks and intergovernmental bodies is also encouraged with a goal to promote cooperation between NHTs and both NMSs and other national bodies which monitor and assess hydrosphere, to promote cooperation in international basins, to secure the participation of NHTs in research funds such as EFAS, and to raise awareness with EU of RA VI capabilities.

6.5 The expected results under Capacity building are quite in line with the priorities and mechanisms of the WMO Strategy for Education and Training in hydrology, namely emphasizing the establishment and broad access to e-learning materials or the greater involvement in existing training programmes. Specifically it also promotes the use of

“cooperating” membership within established organizations and the formation of “twinning” arrangements between developed Members and Members with economies in transition.

6.6 Finally, regarding Efficient management and good governance, the Strategic Plan underlines the need to optimize the use of the limited financial resources available for the regional activities, also expressed through a implicit recommendation to review the structure of the subsidiary bodies of the Regional Associations

Role of NHSs in the implementation of the Water Framework Directive of the European Union

6.7 Cooperation with European Union is particularly focused on the implementation of the Water Framework Directive (WFD) and aims at increasing the involvement and contribution of NHSs in the process.

6.8 To support the implementation of the WFD and ensure the consistent application of its principles in all EU member states, the European commission has established a Common Implementation Strategy (CIS). The NHSs of the European countries recognized the need of having proper representation in this mechanism and tasked the WGH to voice their concerns in the various working groups stemming from the CIS. The RA VI WGH has been granted observer status in the CIS and the following WGH members are participating in CIS activities:

- * Strategic Coordination Group – M. Puupponen (Finland) as observer
- * WG on Reporting – R. Busskamp (Germany)
- * WG on Groundwater – E. Kullman (Slovak Republic)
- * Water scarcity and droughts forum – G. Monacelli (Italy)
- * WG on Floods – B. Ozga-Zielinski (Poland) and I. Karro (Sweden)

6.9 WGH has also been active in cooperating with EC bodies in the implementation of the Directive of Flood Management. Synergies have also been sought between the Expert Circles on Flood Mapping (EXCIMAP) and the APFM in view to produce a manual on flood mapping

Associate Programme on Flood Management

6.10 Within the framework of the APFM and in collaboration with the GWP Central and Eastern Europe (GWP CEE), a pilot project has been conducted in the Central and Eastern Europe involving Bulgaria, Czech Republic, Lithuania, Poland, Romania, Slovak Republic, and Slovenia, focused on the preparation of a status of the impacts of - and responses to various flood events with special emphasis on flash floods. In a second phase of the project, gaps in the flood management practices identified through the earlier study have been addressed in selected pilot areas in Poland, Romania, and Slovak Republic. The project aims in this phase at increasing community resilience to cope with the effects of flash floods especially under the circumstance where early warnings are not readily and timely available.

6.11 Based on the pilot projects and available literature, and with the cooperation of the Polish IMGW a report "Guidance on Flash Flood Management - Recent experiences from Central and Eastern Europe" has been prepared, with the aim to synthesize and, as far as possible, conceptualize the approach that can be taken to address the issue of flash floods both on the national and (for flash floods most importantly) on the lower administrative scales of districts and communities to get a significant reduction of the vulnerability of flash flood affected communities and the associated deaths and misery.

WHYCOS and other cooperation projects

6.12 Six projects are under implementation in RA I, RA II, RA IV and RA V (Niger-HYCOS, Volta-HYCOS, SADC-HYCOS, Mekong-HYCOS, Pacific-HYCOS and Carib-HYCOS) involving 52 Member countries, out of which more than 30 are Least Development Countries (LDCs) and 21 Small Island Developing States (SIDS) with financial support from France, the

6.13 Netherlands and the European Commission. A project proposal for a HYCOS component for the Sava River basin has been developed as a hydrological component within the framework of the South Eastern Europe Disaster Risk Management Initiative (SEEDRMI) in cooperation with the World bank and the ISDR. In order to encourage donors to finance the Sava-HYCOS, WMO is working with the International Sava River Basin Commission (ISRBC) to revise the project proposal including the estimated budget. The project will be reformulated to be implemented in three phases.

6.14 The last meeting of the WHYCOS International Advisory Group recommended, inter alia, to ensure that training activities are given priority in any HYCOS project and that WMO make available for utilization by other projects and NHSs training modules and relevant materials which have been prepared for projects under implementation.

Contribution to CHy activities and projects

6.15 The chairs of the RA Working Groups on Hydrology have been invited to attend the last session of the CHy Advisory Working Group during the previous intersessional period and reported on the regional priorities so that the draft working plan being prepared to submission to the Commission could take into consideration these requirements.

6.16 The CHy Advisory Working Group, at its first meeting in February 2009 has established a detailed work plan for each of its members (see paragraph 3.20). It also agreed that the President with the assistance of the Secretariat should establish an agreed procedure for the interaction between the AWG, the Regional Associations and the RA Working Groups on Hydrology. A draft of this procedure will be informally discussed with the chairs of the RA Working Groups on Hydrology that will attend the next session of the Executive Council in June 2009.

Adaptation to climate variability and change in water sector

6.17 In the framework of the restructuring of the Secretariat, aimed at streamlining its activities and aligning them with the expected results of the Strategic Plan, the former departments Hydrology and Water Resources and World Climate Programme, have been merged into a new department Climate and Water.

ACTION PROPOSED

The Working Group is invited to consider the information provided in the paragraphs above and make comments and recommendation. In particular the meeting, having also considered the information on the future activities of the CHy provided in paragraphs 3.18 to 3.40 above, is expected to identify those to which it could contribute, through specific synergies with its working plan, or through the direct intervention of its Members, and to formulate proposal for the further development of the hydrology and water resources aspects of the regional Strategic Plan in coherence with CHy planned activities.

7. DISCUSSION OF FUTURE ACTIVITIES OF THE REGIONAL ASSOCIATION VI IN THE FIELD OF HYDROLOGY AND WATER RESOURCES

7.1 The meeting will agree on actions to be taken as to complete its work for submission to the next session of the Regional Association, scheduled to be held in Brussels, Belgium, from

16 to 24 September 2009. It will be also invited to make recommendation for future work to be carried by the Working Group. The meeting is also invited to consider and make proposals on the future membership and the way of working of the Group in order to improve its capacity to deliver the expected outputs, also in consideration of the resources available for funding the activities of the Group.

8. ANY OTHER MATTERS

8.1 Participants may wish to make general comments and proposals regarding any aspect of hydrology and water resources assessment in the region.

9. ADOPTION OF THE REPORT AND CLOSURE OF THE MEETING

9.1 The meeting will adopt the report of its ninth session. The session will close on Friday 27 March 2009.