



## **AGRICULTURAL METEOROLOGY PROGRAMME**

### **Report to Plenary on item 4.2**

**REFERENCE:**

Cg-XVI/Doc. 4.2

**APPENDICES:**

- A. Draft text for inclusion in the general summary on item 4.2
- B. Draft Resolution 4.2/1 (Cg-XVI) – Agricultural Meteorology Programme
- C. Draft Resolution 4.2/2 (Cg-XVI) – Use of the Standardized Precipitation Index (SPI) for characterizing meteorological droughts by all NMHSs

**ACTION PROPOSED:**

It is recommended that the draft text given in Appendix A be included in the general summary of the work of the session and that the draft resolutions in Appendices B and C be adopted.

## DRAFT TEXT FOR INCLUSION IN THE GENERAL SUMMARY OF Cg-XVI

### 4.2 AGRICULTURAL METEOROLOGY PROGRAMME (*agenda item 4.2*)

#### The report of the president of CAgM

**4.2.1** Congress noted with appreciation the progress achieved in implementing the Agricultural Meteorology Programme (AgMP) since Fifteenth Congress in 2007 and the report of the fifteenth session of the Commission for Agricultural Meteorology (*Abridged Final Report with Resolutions and Recommendations of the Fifteenth Session of the Commission for Agricultural Meteorology* (WMO-No. 1062)). It expressed its satisfaction with the successful implementation of the Programme according to the direction provided in the Strategic Plan and by the Fifteenth Congress.

**4.2.2** Congress noted that as per the decisions adopted by the Commission for Agricultural Meteorology (CAgM), at its fifteenth session held in Belo Horizonte, Brazil from 15 to 21 July 2010 the activities of the Programme are being implemented in three Open Programme Area Groups:

- (a) Agrometeorological Services for Agricultural Production;
- (b) Support Systems for Agrometeorological Services;
- (c) Climate Change/Variability and Natural Disasters in Agriculture.

**4.2.3** Congress acknowledged with appreciation the work of the Secretariat for the organization of the International Workshop on Addressing the Livelihood Crisis of Farmers: Weather and Climate Services that preceded the CAgM-XV session. Congress thanked the Government of Brazil for hosting the workshop and the many organizations for their co-sponsorship.

**4.2.4** Congress noted with appreciation the progress made in the establishment of the Drought Management Centre for South-Eastern Europe (DMCSEE), identifying consensus indices for meteorological, agricultural, and hydrological drought, increasing interactions between NMHSs and the agricultural community, increasing donor support for agrometeorological projects, and increasing interactions with UN agencies and NGOs.

**4.2.5** Congress further noted that the CAgM has set the priorities for the next intersessional period: support agrometeorological training at regional, national and local levels; develop enhanced services for the agricultural, livestock, forestry and fisheries communities and partner agencies; encourage development of a knowledge sharing interface between forecasters/scientists, extension services and the agricultural decision-makers; and encourage the sharing of resources among WMO Members and other organizations in order to build synergies and to support human health and economic development, which places it in an excellent position to play a major role in the user interface platform component of GFCS. Congress adopted Resolution 4.2/1 (Cg-XVI) – Agricultural Meteorology Programme, on the Implementation of the Programme during the next financial period.

#### Publications

**4.2.6** Congress was pleased to note that the activities implemented under AgMP had resulted in several important publications, including special issues of scientific journals such as the *Journal of Agricultural Science* and *Időjárás*, the Quarterly Journal of the Hungarian Meteorological Service and the books entitled *Managing Weather and Climate Risks in Agriculture, Climate and*

*Land Degradation, and Climate Change and Food Security in South Asia* published by Springer. Congress noted with appreciation that CAgM had published several workshop proceedings, three brochures, and eight CD-ROMs. Congress acknowledged and encouraged the publishing of CD-ROMs to facilitate quick access to information by Members and to publish information in as many official WMO languages as possible given the limited financial resources.

**4.2.7** Congress noted with great appreciation the completion of the *Guide to Agricultural Meteorological Practices* (WMO-No. 134) and thanked all contributors. Congress requested that the electronic version should be made freely available on the Internet and that CD-ROM versions be widely distributed. Congress requested the Members to mobilize resources to translate the Guide into other languages.

### **Drought activities**

**4.2.8** Congress noted the “Lincoln Declaration on Drought Indices” adopted at the Inter-Regional Workshop on Indices and Early Warning Systems for Drought at the University of Nebraska-Lincoln in Lincoln, USA (December 2009) and decided on the use of the Standardized Precipitation Index (SPI) to characterize meteorological drought. Congress adopted Resolution 4.2/2 (Cg-XVI). Congress further noted and supported the ongoing work of WMO and the UN International Strategy for Disaster Reduction (UN-ISDR) on the Agricultural Drought Indices and Hydrologic Drought Indices that will contribute to the chapter on drought risks for the 2011 UN Global Assessment Report on Disaster Risk Reduction (GAR11).

**4.2.9** Congress noted that despite the repeated occurrences of drought impacts on different socio-economic sectors, there is a gap in the policy aspects of droughts and there is a need for concerted efforts to initiate a dialogue on the formulation and adoption of national drought policies to provide a clear legal framework. Many governments have not been proactive in the management of droughts because of the lack of such a legal framework. Congress therefore recommended the organization of a “High-Level Meeting on National Drought Policy” and for WMO to closely collaborate with the UNCCD Secretariat, which is also engaged in efforts to support drought mitigation activities in the context of the UNCCD National Action Programmes (NAPs) implementation processes. Other relevant organizations should also be associated using extrabudgetary resources. Such a high level meeting would contribute to a coherent UN system-wide response to drought impacts.

**4.2.10** Congress supported the efforts of the Secretariat and the Global Water Partnership in developing the proposed Integrated Drought Management Programme and urged the Secretariat to find other partners for this proposal. The principal approach is to develop a global coordination of efforts to strengthen drought monitoring, risk identification, drought prediction and early warning services and development of drought management knowledge base.

### **National Agrometeorological Station Network (NASNET)**

**4.2.11** Congress expressed its support to the establishment of “National Agrometeorological Station Network (NASNET)” endorsed by EC-LX through Resolution 6. Congress impressed upon the NMHSs and universities or national, regional and international institutes engaged in agricultural research, that the agrometeorological stations maintained by them should be considered as a valuable national resource and that Directors of NMHSs should engage in a dialogue with the above institutions to establish a National Agrometeorological Station Network (NASNET) by bringing all the stations being operated by the different entities under one common umbrella in coordination with the WMO Integrated Global Observing System, where such networks do not currently exist.

## **Adaptation to climate change**

**4.2.12** Congress agreed with the recommendations of the Symposium on Climate Change and Food Security in South Asia held in Dhaka, Bangladesh (August 2008) for the creation of a Climate Change and Food Security in South Asia Network (CCFSSANet) and the establishment a South Asia Climate Outlook Forum (SACOF). Congress requested that similar regional workshops be organized in other regions given the availability of financial resources.

**4.2.13** Congress agreed with the recommendations of the Workshop on Adaptation to Climate Change in West African Agriculture held in Ouagadougou, Burkina Faso (27-30 April 2009) that called for the establishment of a West and Central African Network on Climate Change and Food Security (ROCACCSA) and a Technical Secretariat, as part of the ECOWAS Sub-regional Action Programme on Climate Change, comprising of competent institutions at the national and regional level in West Africa and with international institutions and organizations.

**4.2.14** Congress noted that the activities of the AgMP and CAgM will be further guided by the outcomes of WCC-3 and the relevant elements of the GFCS. In order to enhance the contribution of climate information to land management, agriculture and food security including risk evaluation and information delivery, cooperation and partnerships, adaptation strategies are needed for resilient agricultural systems, and climate change mitigation. Congress recognized that the activities of CAgM will provide a major contribution to the development of the Climate User Interface Programme (CUIP) of GFCS. Congress further noted that CAgM and AgMP should define a clear set of priorities related to food security, climate services for sustainable agriculture and agricultural risk management for the CUIP of GFCS and develop an approach for pilot projects to achieve desired deliverables.

## **Implementation of the AgMP - Interactions with other WMO Programmes**

**4.2.15** Congress noted that WMO's GAW/WWRP and CAS have been developing a Sand and Dust Storm Warning and Advisory System (SDS-WAS). Congress expressed its appreciation that the AgMP had provided input into this project with regards to potential agricultural applications.

**4.2.16** Congress noted that the World Bank/WMO project in the Lake Victoria region of East Africa has the goal of enhancing the security of the livelihoods of farmers and fishermen by taking into account historical drought analysis and the development of in-season crop yield forecasts for food security and food aid. Congress acknowledged that the project will support the GFCS and will link with other WMO and World Bank projects, specifically with the Severe Weather Forecast Demonstration Project (SWFDP) which is an activity of CBS. Congress urged the AgMP to continue to provide linkages between NWP forecast products and their application in agricultural decision making.

**4.2.17** Congress encouraged CAgM to contribute to the work of the new CCI-CAgM-CHy Working Group on Climate, Food, and Water.

## **Regional activities in agrometeorology**

**4.2.18** Congress noted that the regional associations have established new Working Groups on Climate Services, Adaptation and Agricultural Meteorology or Working Groups on Climate and Hydrology with Sub-groups or Sub-tasks on Agrometeorology. Congress noted that the recommendation at CAgM-XV to reappoint Working Groups on Agricultural Meteorology for all regional associations had been implemented but only two working groups were able to meet due to lack of resources. Congress urged the Member's financial support to ensure that these groups are able to meet in the next intersessional period.

## **World Agrometeorological Information Service (WAMIS)**

**4.2.19** Congress urged Members to participate and disseminate their products to the global community through the World Agrometeorological Information Service (WAMIS- [www.wamis.org](http://www.wamis.org)) which has products from over 50 countries and organizations and provides over 77 links of tools and resources to help countries improve their bulletins and services. Congress acknowledged the assistance of Italy and the Republic of Korea in providing WAMIS mirror servers. Congress acknowledged and supported the development of an ISO compatible search engine on WAMIS, which is required to provide WAMIS information as a component of the WIS. Congress noted the important voluntary contributions from the Republic of Korea, Italy and the USA to the development and maintenance of WAMIS. Congress supported the work of CAgM in developing the next phase of WAMIS and urged that any further developments be considered for integration into WIS.

## **Training and Capacity-building**

**4.2.20** Congress expressed its appreciation that following the organization of the Expert Meeting on Review of Curriculum in Agricultural Meteorology, the *Guidelines for Curricula in Agricultural Meteorology* (WMO-No. 258) were published. Congress urged the Secretary-General to widely disseminate the new publication and to solicit assistance for its translation into as many official languages as possible. Congress strongly urged Members to widely disseminate these harmonized curricula in agricultural meteorology to national institutions and to encourage their implementation.

**4.2.21** Congress stressed the importance of the organization of Roving Seminars on Weather, Climate and Farmers for taking the weather and climate services to the users and expressed its satisfaction that AgMP was able to provide support to the NMHSs of Bangladesh, Ethiopia, India, Sri Lanka, and Peru to support roving seminars in other countries and regions.

**4.2.22** Congress, in particular, was pleased with the financial support provided by the Meteorological Agency of Spain (AEMET) for the METAGRI project which supported West African NMHSs to organize such roving seminars in their countries. Congress urged Members to make use of such mechanisms to support roving seminars in their regions.

**4.2.23** Congress noted that the CAgM-XV session endorsed several key priorities including the agrometeorological training at various levels and the development of knowledge sharing between scientists/forecasters, agricultural extension services, and agricultural decision makers. Also, given the close interaction of CAgM with the farming community, especially with subsistence farmers, and the strong linkage with capacity development, Congress urged that further collaboration and resource sharing be encouraged between the Education and Training Programme and AgMP and that AgMP should be further supported through the GFCS.

## **Partnerships**

**4.2.24** Congress expressed its appreciation for continued collaborative activities between WMO and a number of international and regional organizations in implementing the Agricultural Meteorology Programme, such as the Convention on Biological Diversity (CBD), the United Nations Convention to Combat Desertification (UNCCD), the Food and Agriculture Organization of the United Nations (FAO), the World Food Programme (WFP), the COST Actions 718 and 734 of the European Science Foundation, the Regional Training Centre for Agrometeorology and Operation Hydrology and their Applications (AGRHYMET) and the African Centre of Meteorological Applications for Development (ACMAD). Congress noted that the continued linkages with these organizations will be very useful to the development of the Climate User Interface Programme (CUIP) of GFCS for the agricultural sector.

## DRAFT RESOLUTION

### Res. 4.2/1 (Cg-XVI) – AGRICULTURAL METEOROLOGY PROGRAMME

#### THE CONGRESS,

#### Noting:

- (1) Resolution 17 (Cg-XV) - Agricultural Meteorology Programme,
- (2) Resolution 9 (EC-LIX) - Report of the fourteenth session of the Commission for Agricultural Meteorology,
- (3) The progress made in the implementation of the Programme, including that on drought and desertification,
- (4) The *Abridged Final Report with Resolutions and Recommendations of the Fifteenth Session of the Commission for Agricultural Meteorology* (WMO-No. 1062),
- (5) The report of the president of the Commission for Agricultural Meteorology,
- (6) The WMO Strategic Plan,

**Expresses** its appreciation for steps taken to assist Members in combating desertification and land degradation, alleviating the effects of drought, applying agrometeorology in the development of sustainable farming systems and improving the adaptive capacity and resilience of agriculture to climate change;

**Decides** that the substance of the Agricultural Meteorology Programme shall be guided by the WMO Strategic Plan adopted under Resolution 8.1/1 (Cg-XVI), and as per the Annex to this resolution;

**Endorses** the decision of the fifteenth session of the Commission for Agricultural Meteorology on the implementation of the Agricultural Meteorology Programme;

#### Urges all Members:

- (1) To collaborate actively in, and to give all possible support to, the implementation of the Agricultural Meteorology Programme, ensuring WMO standards of data collection and data quality are maintained;
- (2) To implement the key priorities for the Programme during the intersessional period 2011 to 2014 as decided by the Commission and informed by the WMO Strategic Plan;
- (3) Agrometeorological data should be integrated within the framework of the WMO Integrated Observing System (WIGOS) and the WMO Information System (WIS);
- (4) To further build and support existing collaboration with other natural resource sciences to ensure that sustainable agricultural systems are developed with a better understanding, valuation and more appropriate application of agrometeorological science;

**Requests** the Executive Council, with the assistance of the Commission for Agricultural Meteorology and other relevant technical commissions, to promote, guide and assist in the implementation of the Agricultural Meteorology Programme;

**Requests** the Secretary-General:

- (1) To take necessary actions, within available budgetary resources, to support Members in their efforts to implement the priority activities in the Agricultural Meteorology Programme as described in the WMO Strategic Plan, at the national level, including support to their efforts in the following:
  - (a) combating desertification and land degradation;
  - (b) alleviating the effects of extreme weather events on agriculture (i.e drought, floods)
  - (c) ensuring that agrometeorology is appropriately applied in the development of sustainable farming systems;
  - (d) improving the adaptive capacity and resilience of agriculture to climate change;
  - (e) engaging policy and decision-makers especially in developing and least-developed countries to ensure that the output of the programme becomes one of the inputs used by NMHS to advise the relevant areas of the national long-term development plans of these states;
- (2) To assist regional associations and their subsidiary bodies to implement the subregional and regional aspects of their priority activities in agrometeorology;
- (3) To continue to build and reinforce existing partnerships with other relevant international organizations in the implementation of the WMO Strategic Plan with regards to priority areas relevant to the Programme, especially in the areas of education and training in agrometeorology and the preparation of guidelines on the improvement of management practices in agriculture and forestry;
- (4) To report annually to the Executive Council on progress achieved and to submit proposals for the future;
- (5) To report to Seventeenth Congress on progress achieved and to submit proposals for the future.

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Note: This resolution replaces Resolution 17 (Cg-XV) which is no longer in force.

Annex: 1

## **Annex to draft Resolution 4.2/1 (Cg-XVI)**

### **Programme Description**

#### **Agricultural Meteorology Programme (AgMP)**

##### **1. Overall objective**

1.1 The overall objective of the Agricultural Meteorology Programme (AgMP) is to assist Members in the provision of meteorological and related services to the agricultural community to help develop sustainable and economically viable agricultural systems. It keeps WMO Members abreast of technological advances in the domain of agrometeorology and ensures that they find practical use in the work carried out by agrometeorological services.

1.2 The main long-term objectives of the AgMP are:

- (i) To promote Members' indigenous capabilities to provide relevant agricultural meteorological services and technologies for sustainable, environment-friendly, and economically viable agricultural production;
- (ii) To foster a better understanding by farmers and other end-users in the agricultural, forestry and related sectors of the value and use of meteorological (including climatological) information in planning and operational activities.

##### **2. Purpose and scope**

2.1 AgMP fulfils one of the main purposes of WMO, namely to further the application of meteorology to agriculture, water problems, and other human activities. (paragraph (d) of Article 2 of the Organization's Convention). It also facilitates the application of meteorology to the protection of livelihoods and property, the health and well-being of citizens, economic growth and the protection of the environment.

2.2 The scope of the AgMP is broad since agriculture as defined by CAgM includes agriculture, forestry, livestock and fisheries. Therefore, the AgMP tries to facilitate of application of meteorology to all of these sectors. Also, AgMP and CAgM have a unique responsibility since they are the only United Nations based entities that represent the scientific discipline of agricultural meteorology.

2.3 The purpose of the AgMP is to support food and agricultural production and activities. The Programme assists Members in provision of meteorological and related services to the agricultural community to help develop sustainable and economically viable agricultural systems, improve production and quality, reduce losses and risks, decrease costs, increase efficiency in the use of water, labour and energy, conserve natural resources and decrease pollution by agricultural chemicals or other agents that contribute to the degradation of the environment. Although sometimes combined, climate information is used mainly for planning purposes, while recent weather data and weather forecasts are used mostly in current agricultural operations.

2.4 Specific efforts ensure that improvements in knowledge, methodologies and skill are made available to developing and Least Developed Countries (LDCs). It also addresses a number of important issues related to disaster risk reduction which includes drought within the framework of an integrated, multi-hazard approach to disaster risk reduction, including early warnings.

2.5 AgMP promotes the planning and use of agricultural technologies for sustainable food production through the provision of improved agricultural weather and climate data systems that

are necessary to expedite generation of products, analyses and forecasts that facilitate agricultural cropping and management decisions, irrigation scheduling, commodity trading and markets, fire weather management and other preparedness for calamities, and ecosystem conservation and management. One goal is to enhance the quality of agrometeorological advisories and products and the bulletins that are routinely issued by Members by developing and disseminating improved tools and methods for their preparation through the World Agrometeorological Information Service (WAMIS-[www.wamis.org](http://www.wamis.org)).

2.6 AgMP provides capacity building in agrometeorology at the national and regional levels. It promotes technological advances in the field of agrometeorology through conferences, workshop and symposia and the publication of the proceedings from these events.

2.7 AgMP contributes to the implementation of the WMO Strategic Plan, mainly to Expected Results 1, 2 and 6 (2012-2015). It also will contribute to the Global Framework on Climate Services by enhancing the contribution of climate information to land management, agriculture and food security including risk evaluation and information delivery, cooperation and partnerships, adaptation strategies for resilient agricultural systems, and climate change mitigation. This will be primarily done through the activities of the Commission for Agricultural Meteorology (CAgM) Open Programme Area Group 3 on Climate Change/Variability and Natural Disasters in Agriculture. The activities of the Commission will provide a major contribution to the development of the Climate User Interface Programme (CUIP) of GFCS.

### **3. AgMP Governance**

3.1 The technical guidance for the AgMP is provided by CAgM. The Commission interacts closely with the Commission for Climatology (CCI) and the Commission for Hydrology (CHy) through the CCI-CAgM-CHy Working Group on Climate, Food and Water and on issues related to drought and the user interactions with GFCS. CAgM interacts with the Joint WMO-IOC Commission for Oceanography and Marine Meteorology (JCOMM) on climate and fisheries issues. It also is involved in reaching out to the agricultural community with regards to the Sand and Dust Storm Warning and Advisory System (SDS-WAS) which is under the direction of the Commission for Atmospheric Sciences (CAS). CAgM also provides linkages between weather forecast products from NWP products and the applications for agricultural decision makers with the Severe Weather Forecast Demonstration Project (SWFDP) which is a Commission for Basic Systems (CBS) activity.

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## DRAFT RESOLUTION

### **Res. 4.2/2 (Cg-XVI) – USE OF THE STANDARDIZED PRECIPITATION INDEX (SPI) FOR CHARACTERIZING METEOROLOGICAL DROUGHTS BY ALL NMHSs**

#### **THE CONGRESS,**

#### **Noting:**

- (1) That the International Workshop on Drought and Extreme Temperatures: Preparedness and Management for Sustainable Agriculture, Rangelands, Forestry & Fisheries organized by WMO and the China Meteorological Administration (CMA) that was held in Beijing, China (February 2009), and the Beijing workshop, recommended that WMO makes appropriate arrangements to identify the methods and to marshal resources for the development of standards for agricultural drought indices in a timely manner,
- (2) That the “Lincoln Declaration on Drought Indices” was adopted at the Regional Workshop on Indices and Early Warning Systems for Drought held in December 2009 in Lincoln, USA,
- (3) That EC-LXII adopted Resolution 15 - Use Of Standardized Precipitation Index (SPI) for Characterizing Meteorological Droughts by all NMHSs,

**Considering** that effective monitoring and early warning systems for the three types of droughts - meteorological, agricultural and hydrological droughts, require standardized indices,

**Requests** Members to ensure that all NMHSs around the world use the Standardized Precipitation Index (SPI) to characterize meteorological droughts, in addition to other drought indices that are already in use in their service;

**Requests** the Secretary-General:

- (1) To ensure that the comprehensive user manual on SPI which provides a description of the index, the computation methods, the current application of the index, the strengths and limitations, mapping capabilities and how it can be used, will be published and distributed in all official languages;
  - (2) To ensure that the outcomes and recommendations of the two Working Groups on Agricultural and Hydrological Drought Indices will be distributed to all Members.
-