

**PROGRESS/ACTIVITY REPORTS PRESENTED AT CAgM-XIV  
(unedited)**

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## PROGRESS/ACTIVITY REPORTS PRESENTED AT CAgM-XIV

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**AGENDA ITEM 3 – REPORT BY THE PRESIDENT OF THE ASSOCIATION****CAGM-XIV /Rep. 3****PROGRESS/ACTIVITY REPORT OF THE AGRICULTURAL METEOROLOGY PROGRAMME FOR THE PERIOD OF OCTOBER 2001 – MAY 2006****Communications from the president**

Through his circular letters (see references 1 to 4), the president kept the members informed about the ongoing activities in the Commission and about matters of importance to the Commission emanating from the different sessions of the constituent bodies of WMO as well as other important meetings.

**Reorganization of the Commission**

At its thirteenth session, the Commission adopted a new working structure to improve the efficiency and effectiveness of the Commission. The Commission needed to contribute effectively to the Agricultural Meteorology Programme with a 21<sup>st</sup> Century outlook in a cost-effective manner.

There are three main programme areas:

- 1) Agrometeorological Services for Agricultural Production, focusing on operational and research activities that promote agricultural production;
- 2) Support Systems for Agrometeorological Services, concentrating on network observations, data and information management, and technological developments needed to advance the production of services; and,
- 3) Climate Change/Variability and Natural Disasters in Agriculture, dealing with priority issues affecting agriculture.

**Agricultural Meteorology Programme**

The AgMP is actively involved in three major programme areas, including Agrometeorological Services for Agricultural Production, Support Systems for Agrometeorological Services and Climate Change/Variability and Natural Disasters in Agriculture. The long-term objectives are: (i) promote economically viable and high quality production so it can be sustainable and environment-friendly by strengthening members' indigenous capabilities to provide relevant meteorological services to agriculture; and (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 information for planning and operational activities.

In the light of the growing concerns with the impacts of climate variability, climate change and natural disasters on agriculture, there is an increasing demand for improved agrometeorological services, especially warnings and advisories to cope with these impacts. Development of improved support systems are crucial for the provision of such services. The AgMP has carried out an excellent job, given its limited resources, to promote the three programme areas. CAGM-XIV/INF. 2 presents a detailed report of the progress made in the implementation of the AgMP since the last session of the Commission (see reference 5).

## **CAGM Management Group**

Two meetings of the Management Group of CAGM were held (Washington DC, June 2003 and Guaruja, March-April 2005) during the intersessional period. The president greatly appreciated the amount of time and effort that the members of the Management Group devoted to the Commission, noting that the guidance and recommendations of the Management Group were instrumental to the success of CAGM. Regrettably, the passing of Dr. Wolfgang Baier was a deep loss to the Management Group.

### **Status of Report Preparation by CAGM-XIII ETs**

#### **OPAG 1:**

- (a) Dr Roger Stone (Australia), chairperson of the ET on Weather, Climate and Farmers, has submitted the final report. A summary of the report and actions to be undertaken are contained in CAGM-XIV/Doc. 9.2.
- (b) Dr Byong Lee (Republic of Korea), chairperson of the ET on Strengthening Information and Dissemination Networks, including Monitoring and Early-Warning Systems is preparing the final report and actions to be undertaken are contained in CAGM-XIV/Doc. 9.3.
- (c) Dr Zoltan Dunkel (Hungary), chairperson of the ET on Management of Natural and Environmental Resources for Sustainable Agricultural Development, has submitted the final report. A summary of the report and actions to be undertaken are contained in CAGM-XIV/Doc. 9.4.

#### **OPAG 2:**

- (d) Dr Federica Rossi (Italy), chairperson of the ET on Techniques (including technologies such as GIS & Remote Sensing) for Agroclimatic Characterization and Sustainable Land Management, has submitted the final report. A summary of the report and actions to be undertaken are contained in CAGM-XIV/Doc. 10.2.
- (e) Dr Elijah Mukhala (Botswana), chairperson of the ET on Data Base Management, Validation and Application of Models, & Research Methods at the Eco-Regional Level, has submitted the final report. A summary of the report and actions to be considered are contained in CAGM-XIV/Doc. 10.3.

#### **OPAG 3:**

- (f) Dr Holger Meinke (Australia), chairperson of the ET on Impact of Climate Change/Variability and Medium- to Long-Range Predictions for Agriculture, has submitted the final report. A summary of the report and actions to be considered are contained in CAGM-XIV/Doc. 11.2.
- (g) Dr Haripada Das (India), chairperson of the ET on the Impact of Natural Disasters and Mitigation of Extreme Events in Agriculture, Rangelands, Forestry, and Fisheries, has submitted the final report. A summary of the report and actions to be undertaken are contained in CAGM-XIV/Doc. 11.3.
- (h) Dr Raymond Desjardins (Canada), chairperson of the ET on Contribution of Agriculture to the State of Climate has submitted the final report. A summary of the report and actions to be considered are contained in CAGM-XIV/Doc. 11.4.

**ET GAMP:**

- (i) Prof. C.J. Stigter (Netherlands), chairperson of the Expert Team on the Guide to Agricultural Meteorological Practices, submitted the final report. A summary of the report and the progress of the revision of the Guide are contained in CAgM-XIV/Doc. 12.1.

**Expert Team Publication Deliverables:**

The Expert Team members met their goals of producing quality presentations and contributions to the terms of reference of their respective ETs. The scientific and technical contributions presented at a number of these meetings led to quality publications including the following:

- (a) Technical book published by Springer entitled "Natural Disasters and Extreme Events in Agriculture";
- (b) Special issue by Meteorological Applications Journal, published by the Royal Meteorological Society;
- (c) Special issue of Agricultural and Forest Meteorology Journal;
- (d) Special issue of the Australian Journal of Agricultural Research.

**Status of Report Preparation by CAgM-XIII Implementation/Coordination Teams**

The ICTs concentrated on evaluating the reports of their ETs in their respective OPAGs and reviewed feasible recommendations for implementation at the regional level. The ICTs produced a large number of recommendations for consideration. Training programmes and roving seminar activities were also identified in the recommendations.

- (a) Dr Paul Doraiswamy (United States), chairperson of the Implementation/Coordination Team on Agrometeorological Services, submitted a final report. A summary of the report and actions to be undertaken are contained in CAgM-XIV/Doc. 9.1.

An Inter-Regional Workshop in Manila, Philippines, co-sponsored by WMO, FAO, PAGASA, and USDA to identify strategies to strengthen operational agrometeorological services, focusing primarily on bridging interactions between agrometeorologists and agricultural extension services to provide better services to farmers, preceded the ICT meeting. Proceedings of the workshop were published in a technical document entitled "Strengthening Operational Agrometeorological Services at the National Level."

- (b) Prof. Giampiero Maracchi (Italy), chairperson of the Implementation/Coordination Team (2) on Support Systems for Agrometeorological Services, submitted a final report. A summary of the report and actions to be undertaken are contained in CAgM-XIV/Doc. 10.1.
- (c) Dr Jim Salinger (New Zealand), chairperson of the Implementation/Coordination Team (3) on Climate Change/Variability and Natural Disasters in Agriculture, has submitted the final report. A summary of the report and actions to be undertaken, including pilot project activities to be discussed below, are contained in CAgM-XIV/Doc. 11.1.

### **Pilot Project Activities**

The ICTs recommended potential pilot projects, which are a means of implementing key recommendations of the ICTs at the regional level. Most would necessitate external donor collaboration and partnerships for full implementation. This poses many challenges for success, including funding support. Some of the pilot projects have already been initiated. A dictionary of languages to be used for multi-lingual translation of bulletins and advisories has been implemented by the Republic of Korea. Currently, over 2600 agricultural meteorology terms in Japanese, English, Chinese, and Korean have been translated. This initiative was developed from the Expert Team Meeting on Strengthening Information and Dissemination Networks, Including Monitoring and Early-Warning Systems.

The pilot projects must be selected based upon relevancy to the region, feasibility in terms of objective, and resource availability. For example, three pilot projects have been identified for development by ICT 3: Assessment of Natural Disaster Impacts on Agriculture (ANADIA); Contribution of Agriculture to the State of Climate (CONASTAC); and Climate Forecasts for User Communities. Each pilot project focuses cases studies in different regions that are appropriately unique to that region. Some progress has been made in developing concept notes, project plans, and identifying initial donor support for some of these pilot projects.

### **Working Groups on Agricultural Meteorology of Regional Associations**

During the intersessional period, the following meetings of the Working Groups on Agricultural Meteorology of Regional Associations were held:

- RA II (15-17 December 2003, Jeddah, Saudi Arabia)
- RA VI (17-19 December 2003, Braunschweig, Germany)
- RA III (30 November-3 December 2004, Lima, Peru)
- RA IV (14-17 December 2004, Christ Church, Barbados)
- RA V (6-9 March 2006, Bukittingi, Indonesia)
- RA I (7-9 August 2006, Tripoli, Libya)

### **World Agricultural Meteorological Information Service (WAMIS)**

WAMIS has continued to grow over the past 4 years. Twenty-five countries or services are sending operational products to the WAMIS Website, which is located at [www.wamis.org](http://www.wamis.org). Tools and resources have been posted. The value of WAMIS is clearly demonstrated in operational applications. WAMIS was designated as the central website for rainfall and temperature data in near-real time and additional unique locust weather information specifically available for the Locust Control Centers.

### **Norbert Gerbier-MUMM International Award**

The WMO Executive Council conferred the Norbert Gerbier-MUMM International Award for 2003, 2004, 2005, and 2006 for the following papers:

#### **2003:**

V. Ramaswamy (USA), M.-L. Chanin (France), J. Angell (USA), J. Barnett (UK), D. Gaffen (USA), M. Gelman (USA), P. Keckhut (France), Y. Koshelkov (France), K. Labitzke (Germany), J.-J. R. Lin (USA), A. O'Neill (UK), J. Nash (UK), W. Randel (USA), R. Rood (USA), K. Shine (UK), M. Shiotani (Japan), R. Swinbank (UK). Stratospheric Temperature Trends: Observations and Model Simulations. *Reviews of Geophysics*, (2001) 39, 1 pp 71-122.

**2004:**

B.E. Law (USA), E. Falge (Germany), L. Gu (USA), D.D. Baldocchi (USA), P. Bakwin (USA), P. Berbigier (France), K. Davis (USA), A.J. Dolman (The Netherlands), M. Falk (USA), J.D. Fuentes (USA), A. Goldstein (USA), A. Granier (France), A. Grelle (Sweden), D. Hollinger (USA), I.A. Janssens (Belgium), P. Jarvis (UK), N.O. Jensen (Denmark), G. Katul (USA), Y. Mahli (UK), G. Matteucci (Italy), T. Meyers (USA), R. Monson (USA), W. Munger (USA), W. Oechel (USA), R. Olson (USA), K. Pilegaard (Denmark), K.T. Paw U (USA), H. Thorgeirsson (Iceland), R. Valentin (Italy), S. Verma (USA), T. Vesala (Finland), K. Wilson (USA), S. Wofsy (USA). Environmental Controls Over Carbon Dioxide and Water Vapor Exchange of Terrestrial Vegetation. *Agricultural and Forest Meteorology*, (2002) 113, pp 97-120.

**2005:**

Drs G. Beig (India), P. Keckhut (France), R.P. Lowe (Canada), R.G. Roble (USA), M.G. Mlynczak (USA), J. Scheer (Argentina), V.I. Fomichev (Canada), D. Offermann (Germany), W.J.R. French (Australia), M.G. Shepherd (Canada), A.I. Semenov (Russian Fed.), E.E. Remsberg (USA), C.Y. She (USA), F.J. Lubken (Germany), J. Bremer (Brazil), B.R. Clemesha (Brazil), J. Stegman (Sweden), F. Sigernes (Norway), S. Fadnavis (India). Review of Mesospheric Temperature Trends. *Reviews of Geophysics*, (2003) 4, pp 1-41.

**2006:**

Drs T.N. Palmer (UK), A. Alessandri (Italy), U. Andersen (Denmark), P. Cantelaube (Italy), M. Davey (UK), P. Delecluse (France), M. Deque (France), E. Diez (Spain), F.J. Doblado-Reyes (UK), H. Feddersen (Denmark), R. Graham (UK), S. Gualdi (Italy), J.-F. Gueremy (France), R. Hagedorn (UK), M. Hoshen (UK), N. Keenlyside (Germany), M. Latif (Germany), A. Lazar (France), E. Maisonave (France), V. Marletto (Italy), A.P. Morse (UK), B. Orfila (Spain), P. Rogel (France), J.-M. Terres (Italy), M.C. Thomson (USA). Development of a European Multimodel Ensemble System for Seasonal- to-International Prediction (DEMETER). *Bulletin of the American Meteorological Society*, (2004) 85, pp 853-872.

**Representation at Executive Council and Meetings of Presidents of Technical Commissions**

A number of cross-cutting issues continue to be addressed at the Executive Council session and by the technical commissions.

- (a) The Inter-Commission Coordination Group on WMO Information Systems (ICG-WIS) fosters the development of WIS. Dr Byong Lyol-Lee (Republic of Korea) represented CAgM on ICG-WIS. Mr Emmanuel Cloppet (France) serves as the CAgM representative on the Inter-Programme Expert Team on Metadata Implementation.
- (b) The Inter-Commission Task Team on Quality Management Framework (ICTT-QMF) reviewed the WMO QMF. Mr Francesco Sabatini (Italy) serves as the CAgM representative on ICTT-QMF.
- (c) The WMO Long-term Plan measures the socio-economic well-being of nations in terms of food security and safeguards against natural disasters and emergencies. The presidents of technical commissions nominated Bruce Stewart, president of the Commission for Hydrology, to represent all presidents at the long-term planning meetings.
- (d) Global Earth Observing System of Systems (GEOSS) is a coordinated 10-year implementation plan for an Earth Observation System to address global environmental and economic challenges. Mr Mark Brusberg (USA) serves as the CAgM representative.

**AGENDA ITEM 4 – NATIONAL PROGRESS REPORTS ON AGRICULTURAL METEOROLOGY****CAgM-XIV /Rep. 4****PROGRESS/ACTIVITY REPORT**

1. At its thirteenth session, CAgM reviewed the usefulness of the procedure followed in the preparation and distribution of National Reports on Progress Made in Agricultural Meteorology. It agreed with the proposal of the WMO Secretariat to compile the information provided in the reports in a comprehensive database (*see reference 1*). In order to facilitate the preparation of these reports made by Members during 2002-2005 according to the standard layout, the WMO Secretariat has prepared a questionnaire, which was circulated to all the Members (*see reference 2*). As of 15 August 2006, 62 Members responded to the questionnaire and a consolidated list of these Members is appended to this document.

2. The questionnaire consists of seven parts, which provided valuable information on the organization of agrometeorological units and observation networks, the agrometeorological services provided for agriculture, the nature of agrometeorological and agroclimatological research undertaken, listing of case studies that demonstrate the socio-economic benefits of the agrometeorological services, the agrometeorological models used, and the latest relevant papers and reports published by the service.

3. The trend in training and education shows some promise. From the Members responding, 48% of the Members have trained people with advanced degrees compared to 32% in 2002. From the 62 responses, a total of 775 people have attended long-term training courses and 2210 have attended short-term seminars and workshops. The latter figure is higher than in 2002 but is influenced by one or two large countries. There is a wide variation between the Members in the number of people engaged in agricultural meteorology, i.e. from none to over 3000. Of the Members that responded, 40% have at least one staff member in agricultural meteorology with a doctoral degree compared to 75% in 2002.

4. The number of stations in the network of agrometeorological observations has remained almost the same in many of the reporting countries. In comparison with 2002, 12 Members reported increases in the number of stations while only 6 reported a decline. However, there is a continued growing trend towards installation of automatic weather stations (AWS). In 2005, 61% of the members reported installing at least one AWS compared to 55% in 2002.

5. Virtually, all the Members who responded had at least one personal computer available to their agricultural meteorology divisions. There has been a significant increase in the use of the Geographic Information System (GIS) and remote sensing facilities. In 2005, 70% of Members reported the use of GIS facilities compared to 46% in 2002. In 2005, 53% of Members reported the use of remote sensing facilities compared to 34% in 2002.

6. In 2005, 85% of the Members reported undertaking at least one area of research in their service compared to 77% in 2002. In terms of agrometeorological research, the most common areas were agrometeorological aspects of drought and desertification (66% of Members); influence of meteorological factors on the growth, development, yield and quality of agricultural crops (61%); potential impacts of climate change/variability on national agriculture, rangelands, forestry, and fisheries (58%); development of methods for agrometeorological forecasting and assessment of present condition (56%); and macroclimatic, mesoclimatic and microclimatic research (47%). The least common research areas were the influence of meteorological and climatological factors on

inland coastal and marine fisheries (8% of Members); influence of meteorological factors on livestock husbandry (15%), and the impact of agricultural activities that possibly influence weather and climate at local, national, and global levels (29%). A large number of papers and reports were published by the Members during 2002-2005 and a comprehensive list of these publications has been prepared and placed on the WMO Web page ([www.wmo.int](http://www.wmo.int)).

7. In 2005, 90% of the Members provided decadal, weekly, or monthly bulletins compared to 76% in 2002. Sixty to 65% of the Members provided agrometeorological services through brochures and information pamphlets, workshops and seminars, press releases, radio and television, and interactions with farmers and/or farmer groups. These percentages were comparable to 2002 levels.

8. Forty-four percent of Members reported having agrometeorological service as a separate unit. About 55% of the Members had the agrometeorological service at the headquarters and 44% reported agrometeorological services in different regions of their countries.

9. Virtually all of the Members collaborated with other institutions at the national level, in particular with government agencies such as the Ministry of Agriculture and NGOs in their country and region. Media interaction via television and radio was reported to be 55% of the Members that responded, electronic means by 60%, and newspaper and magazines by 77%. This percentage has increased since 2002 where only 50% of the Members reported routine media interactions. Sixty-nine percent cooperate with Ministries and other sectors in awareness and training events conducted. Meteorologists/climatologists as well as representatives of other sectors attend these events.

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**LIST OF MEMBERS WHO RESPONDED TO THE QUESTIONNAIRE ON  
NATIONAL REPORTS ON PROGRESS MADE DURING 2002-2005**

(As of 15 August 2006)

1. Algeria
2. Argentina
3. Austria
4. Azerbaijan
5. Bahrain
6. Bangladesh
7. Belarus
8. Bosnia and Herzegovina
9. Bulgaria
10. Canada
11. Chile
12. China
13. Colombia
14. Congo
15. Côte d'Ivoire
16. Croatia
17. Cyprus
18. Czech Republic
19. Democratic People's Republic of Korea
20. Dominican Republic
21. Ecuador
22. Egypt
23. Ethiopia
24. Fiji
25. France
26. Gambia
27. Georgia
28. Germany
29. Greece
30. Hungary
31. Islamic Republic of Iran
32. Ireland
33. Israel
34. Kazakhstan
35. Malawi
36. Malaysia
37. Mali
38. Nepal
39. Niger
40. Peru
41. Philippines
42. Portugal
43. Poland
44. Romania
45. Republic of Moldova
46. Russian Federation
47. Samoa
48. Serbia
49. Slovakia
50. Slovenia
51. Spain
52. St Lucia
53. Sudan
54. Switzerland
55. The former Yugoslav Republic of Macedonia
56. Trinidad and Tobago
57. United Arab Emirates
58. United Kingdom of Great Britain and Northern Ireland
59. United States of America
60. Uzbekistan
61. Venezuela
62. Zimbabwe

**AGENDA ITEM 5 – REGIONAL ACTIVITIES IN AGROMETEOROLOGY****CAGM-XIV /Rep. 5****PROGRESS/ACTIVITY REPORT**

2. The regional associations establish working groups or appoint Rapporteurs on Agricultural Meteorology to study problems of specific interest to the Regions. In framing the terms of reference of such working groups and rapporteurs, the Associations give due consideration to the views and recommendations of the Commission. Information on short-term missions, WMO-sponsored or co-sponsored symposia, seminars and training courses held in various Regions, including those on special activities such as the combat against desertification and desert locusts, as well as WMO's representation at meetings of other organizations held in different regions is given in CAGM-XIV/INF. 2.

2. An Inter-Regional Workshop on Strengthening Operational Agrometeorological Services at the National Level was held from 22 to 26 March 2004 in Manila, Philippines. The Workshop was organized by WMO, the United States Department of Agriculture (USDA), FAO, and the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA). Twenty-eight participants from 19 countries attended the Workshop.

**Regional Association for Africa (RA I)**

3. At the thirteenth session of RA I held in Mbane, Swaziland, from 20 to 28 November 2002, the Association noted the importance of agriculture to the economic development of many countries in the Region and adopted Resolution 8 establishing a Working Group on Agricultural Meteorology (*see reference 1*). Mr Isaac Tarakidzwa (Zimbabwe) was invited to serve as the chairman of the working group.

**Regional Association for Asia (RA II)**

4. At the twelfth session of RA II held in Seoul, Republic of Korea, from 19 to 27 September 2000, the Association adopted Resolution 12, establishing a Working Group on Agricultural Meteorology (*see reference 2*). Dr G.A. Kamali (Iran) was invited to serve as the chairman of the working group.

5. At the thirteenth session of RA II held in Hong Kong, China, from 7 to 15 December 2004, the Association adopted Resolution 15, re-establishing the Working Group on Agricultural Meteorology (*see reference 3*). Dr G.A. Kamali (Iran) was again invited to serve as the chairman of the working group.

**Regional Association for South America (RA III)**

6. At the thirteenth session of RA III held in Quito, Ecuador, from 19 to 16 September 2001, the Association adopted Resolution 9, establishing a Working Group on Agricultural Meteorology (*see reference 4*). Mr C. Alarcon (Peru) was invited to serve as the chairman of the working group. A meeting of the working group was held in Lima, Peru, from 30 November to 3 December 2004.

**Regional Association for North and Central America (RA IV)**

7. At the thirteenth session of RA IV held in Maracay, Venezuela, from 28 March to 6 April 2001, the Association adopted Resolution 10 (XIII-RA IV) and re-established the Working Group on Agricultural Meteorology with renewed terms of reference (*see reference 5*). It invited Dr O. Solano (Cuba) to act as the chairman of the working group. A meeting of the working group was held from 14 to 17 December 2004 in Bridgetown, Barbados.

8. At the fourteenth session of RA IV held in San Jose, Costa Rica, from 5 to 15 December 2005, the Association adopted Resolution 10, re-establishing a Working Group on Agricultural Meteorology (*see reference 6*). Dr O. Solano (Cuba) was again invited to serve as the chairman of the working group.

#### **Regional Association for the South-West Pacific (RA V)**

9. At the thirteenth session of RA V held in Manila, Philippines from 21 to 28 May 2002, the Association adopted Resolution 10, establishing a Working Group on Agricultural Meteorology (*see reference 7*). Dr R. Boer (Indonesia) was invited to serve as chairman of the working group. A meeting of the working group was held in Bukittingi, Indonesia, from 6 to 10 March 2006.

10. At the fourteenth session of RA V held in Adelaide, Australia, from 9 to 16 May 2006, the Association re-established the Working Group on Agricultural Meteorology.

#### **Regional Association for Europe (RA VI)**

11. At the thirteenth session of RA VI held in Geneva, Switzerland, from 2 to 10 May 2002, the Association adopted Resolution 15, re-establishing the Working Group on Agricultural Meteorology (*see reference 8*). Prof. G. Maracchi (Italy) was invited to serve as chairman of the working group. A meeting of the working group was held in Braunschweig, Germany, from 17 to 19 December 2003.

12. At the fourteenth session of RA VI held in Heidelberg, Germany from 7 to 15 September 2005, the Association adopted Resolution 14, establishing a Working Group on Agricultural Meteorology (*see reference 9*). Dr J. Etzinger (Austria) was invited to serve as the chairman of the working group.

### **AGENDA ITEM 6 – EVALUATION OF THE SIXTH LONG-TERM PLAN AND THE AGRICULTURAL METEOROLOGY PROGRAMME**

#### **CAGM-XIV /Rep. 6**

#### **PROGRESS/ACTIVITY REPORT**

1. The Fourteenth Congress approved the Agricultural Meteorology Programme (AgMP) in the Sixth Long-term Plan (*see reference 2*). The purpose of the Programme was to support food and agricultural production and activities. The Programme was to assist Members in the provision of meteorological and related services to the agricultural community to help develop sustainable and economically viable agricultural systems. Its main emphases are to improve production and quality, reduce losses and risks, decrease costs, increase efficiency in the use of water (especially on semi-arid and drought-prone land), labour and energy, conserve natural resources, combat drought and desertification and decrease pollution by agricultural chemicals or other agents that contribute to the degradation of the environment.

2. Specific objectives and plans of AgMP are being addressed through three projects: Agrometeorological services for agricultural production, Support systems for agrometeorological services and Climate change/variability and natural disasters in agriculture. Activities under each of these projects are being implemented through the organization of workshops, symposia, seminars, training courses, roving seminars, and through assistance to the Members by short-term missions, publications and guidance material (*see reference 1*).

1. A number of training workshops, regional technical meetings, roving seminars, and meetings of all the Regional Working Groups on Agricultural Meteorology were organized by AGM

(see *reference 1*). AGM responded to an immediate urgent challenge of a locust plague in Africa by convening an Expert Meeting on Meteorological Information for Locust Control in 2004. Subsequently AGM organized two joint Regional Workshops in collaboration with FAO in 2005 and 2006, which led to significant action items on operational meteorological support for locust monitoring for the National Locust Control Centres (NLCCs).

4. The president of the Commission, in his periodic circulars to members of the Commission, has kept the members informed on the progress of the implementation of the 6LTP. The Executive Council, at its fifty-seventh and fifty-eighth sessions (June 2005 and June 2006), reviewed the progress in the implementation of the 6LTP.

## **AGENDA ITEM 7 – PREPARATION OF THE WMO STRATEGIC PLAN AND THE AGRICULTURAL METEOROLOGY PROGRAMME**

### **CAgM-XIV /Rep. 7**

#### **PROGRESS/ACTIVITY REPORT**

1. Resolution 26 (Cg-XIV) requests the Executive Council to establish the necessary coordination mechanism for the preparation of the Seventh WMO Long-term Plan and requested the technical commissions to lead the formulation of all scientific and technical aspects of WMO Programmes and activities falling within their respective responsibilities, including relevant analysis, assessment and indication of priorities.
2. The Executive Council at its fifty-eighth session (EC-LVIII) agreed that hereafter the Seventh Long-term Plan should be referred to as the WMO Strategic Plan (SP) and that SP would be a statement of strategic intent for the Organization for the period 2008-2011, corresponding with the fifteenth financial period. The scope of the SP would reflect the reality of the changing world where the planning horizon has become much shorter, but it still provides a longer-term perspective in terms of planning framework and strategic analysis.
3. The SP would retain the initial five desired outcomes (DO) from the 6LTP which are as follows:
  - DO 1: Improved protection of life and property;
  - DO 2: Increased safety on land, at sea and in the air;
  - DO 3: Enhanced quality of life;
  - DO 4: Sustainable economic growth;
  - DO 5: Protection of the environment.
4. EC-LVIII agreed that the nine strategies in the 6LTP should be revised in the SP renaming the initial three strategies as the primary WMO objectives (renamed as Top Level Objectives), which would be achieved by the remaining six strategies. The Top Level Objectives (TOLO) are as follows:
  - TOLO 1: To deliver increasingly accurate and reliable warnings of severe events related to weather, climate, water and the related natural environment throughout the world, and ensure that they are able to reach their target audience (individuals, emergency services, decision makers) in a timely and useful manner.
  - TOLO 2: To enable the provision of increasingly beneficial weather, climate, water and related environmental services to the public, governments and other users/customers throughout the world.

TOLO 3: To inform society through WMO, which is the United Nations system's authoritative voice, and through the National Meteorological and Hydrological Services, which are the national authorities, on the state and behaviour of the Earth's atmosphere, its interaction with the oceans, the climate it produces and the resulting distribution of water resources; and to ensure that WMO and NMHSs support relevant international conventions, protocols, and other legal instruments, and that these agreements are scientifically based.

5. The six strategies are identified with six key areas of activities to which they are primarily (though not exclusively) associated:

Strategy 1: Capacity Building

To inform and educate the public, governments and other interested parties about the socio-economic benefits of understanding the weather, climate, water and related environment.

Strategy 2: Research and Development

To improve understanding and prediction of the processes which affect the current and future state of the atmosphere, the weather, water resources, the physical state of the oceans, climate change and related environmental states such as air quality and pollution levels

Strategy 3: Data and Observations

To observe, record and report on the weather, water resources, climate and the related natural environment, to use these data for the preparation of operational forecast and warning services and related information, and to maintain and enhance systems to exchange these data, products and information.

Strategy 4: Service Delivery

To enhance the capabilities of NMHSs to deliver services, and to improve cooperation and collaboration between them.

Strategy 5: Partnership, Advocacy and Outreach

To work more effectively with service users, international partners, other relevant organizations, academia, the media and the private sector.

Strategy 6: Supporting Services

To improve the effectiveness, efficiency and flexibility of the structure and working mechanisms and practices of WMO, to enable it to respond more rapidly to the changing needs of society and to the new opportunities provided by technological advances.

6. The realization and performance evaluation of the Strategic Plan will be carried out through Expected Results, Key Performance Indicators (KPIs) and Key Performance Targets (KPTs). These are associated to one of the six strategies (associated to a primary key activity area) and link the WMO operating plans with the Strategic Plan. On this basis, operating plans will be developed for the WMO Programmes and other Main Activities.
7. Technical Commissions will develop their own strategic/action plans in which they identify their own KPTs in support of the overall WMO KPTs identified for each expected result. Mapping the KPIs and KPTs to these individual activities is part of the

development of the operational plans of the WMO Programmes, which implement the work of the Technical Commissions.

8. Expected Results (ER) 2, 6, 7, 8 and 9 of the WMO Operating Plan are relevant from the activities of CAgM and these are as follows:
  - ER 2: Improved methodologies, reliability and usefulness of climate predictions and assessments;
  - ER 6: Enhanced capabilities of NMHSs in multi-hazard early warning and disaster preparedness;
  - ER 7: Strengthened social and economic development through improved weather, climate, water and environmental applications and services;
  - ER 8: Increased advocacy and support related to weather, climate, water and environmental issues, conventions and other multilateral agreements;
  - ER 9: Development and implementation of comprehensive measures for capacity building in developing countries, particularly LDCs, for enhanced weather, climate, water and environmental-related services.
9. The draft contribution of the Agricultural Meteorology Programme (AgMP) for the 7SP is given in Appendix B. The main long-term objectives of the draft AgMP for the 7SP are:
  - (a) To promote environmentally sustainable, economically viable and high quality agricultural production by strengthening Members' capabilities to provide relevant meteorological services to agricultural and other related sectors;
  - (b) 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 information in planning and operational activities.
10. Specific programme requirements and related activities for the fifteenth financial period (2008-2011) have been formulated and summarized under three major key focus areas. These include:
  - (a) Agrometeorological services for agricultural production;
  - (b) Support systems for agrometeorological services; and
  - (c) Climate change/variability and natural disasters in agriculture.

## **DRAFT CONTRIBUTION FROM THE AGRICULTURAL METEOROLOGY PROGRAMME TO THE WMO STRATEGIC PLAN (SP)**

### **1. Purpose and scope**

The purpose of the Agricultural Meteorology Programme (AGMP) is to assist Members in the provision of meteorological and related services to the agricultural community in order to help develop sustainable and economically viable agricultural systems. The main emphasis is to improve production and quality, reduce losses and risks, decrease costs, increase efficiency in the use of water (especially on the semi-arid and drought-prone lands), labour and energy, conserve natural resources, combat drought and desertification and decrease pollution by agricultural chemicals or other agents that contribute to the degradation of the environment. The programme deals with applications to agriculture of both climate information, which is used mainly for strategic planning purposes and recent weather data and weather forecasts used mostly in day-to-day agricultural operations.

As regards the programme's involvement in the implementation of the WMO strategies, its main contribution will be made to Strategy 4, since it will enhance the capabilities of NMHSs to deliver services, and improve cooperation and collaboration between them, and to Strategy 5 through working more effectively with service users, international partners, other relevant organizations, academia, the media and the private sector.

### **2. Main long-term objectives**

The main long-term objectives of the Agricultural Meteorology Programme are:

- (a) To promote environmentally sustainable, economically viable and high quality agricultural production by strengthening Members' capabilities to provide relevant meteorological services to agricultural and other related sectors;
- (b) 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 information in planning and operational activities.

Three major key focus areas under which activities will be carried out were adopted in order to adequately fulfil the above objectives. These areas are:

- (a) Agrometeorological services for agricultural production;
- (b) Support systems for agrometeorological services and;
- (c) Climate change/variability and natural disasters in agriculture.

### **3. Implementation activities 2008-2011**

Implementation activities will be presented in relation to key focus areas. The implementation of the programme will include:

#### **3.1 Agrometeorological services for agricultural production**

- (a) Transferring Agrometeorological Products to Farmers and Extension Services

The use of agrometeorological products by the user communities in different Regions will be reviewed and evaluated and guidance on agrometeorological applications will be provided to

farmers and extension services. Recommendations for improvements in advisories and forecasts for both short-term daily operational decisions and long-term strategic planning at the farm level will be made. Case studies from Member countries of successful applications of weather and climate products for agriculture will be collected and the strengths, weaknesses and limitations for more general use will be reviewed. Recommendations will be developed for enhancing more effective transfer and dialogue between agrometeorological service providers and farmers at the local level in order to provide better services to farmers.

**Key performance targets include :**

- Significant increase in the number of farmers understanding the value and utility of weather and climate information in their operational decisions by 2011;
- Number of improved advisories and forecasts for operational decisions and strategic planning at the farm level enhanced by 30% by 2011;
- Significant increase in the number of NMHSs demonstrating successful applications of weather and climate information in enhancing agricultural productivity by 2010.

(b) Agrometeorological Aspects of Sustainable Agricultural Development

The status of agrometeorological applications to conserve and manage natural and environmental resources for the benefit of agriculture, rangelands, forestry, fisheries and other relevant rural activities will be reviewed and evaluated. Case studies of successful measures to manage land use, protect land and mitigate land degradation will be collected and evaluated and a better understanding of the agrometeorological aspects of land degradation at the national and regional levels will be promoted. Agrometeorological aspects of increasing water efficiency including watershed management will be reviewed and summarized. Operational guidelines for fire weather agrometeorology will be established. The impact of weather and climate information on fisheries will be reviewed and summarized. Liaison will be established with JCOMM on the Inter-Commission activities on natural disaster reduction in coastal lowland areas.

**Key performance targets include :**

- Developing guidance material on agrometeorological aspects of land degradation by 2010;
- Production of operational guidelines for fire weather agrometeorology by 2009.

3.2 Support systems for agrometeorological services

(a) Collection and Evaluation of Operational Agrometeorological Tools and Methodologies

A comprehensive review of the different tools and methodologies available for operational applications in agrometeorology in different regions will be made and the actual performance of such tools and methodologies and their operational use and feasibility in different regions will be evaluated. Recommendations will be made on the ways and means to enhance the use of the promising tools and methodologies by various agencies in different regions. Application of different tools and methodologies in different regions through the use of case studies will be promoted and the impacts of such applications on services provided to the farming sector will be evaluated.

**Key performance targets include :**

- Developing procedures and guidance material for effective use of agrometeorological tools and methodologies in different Regions by 2011;

- Documentation on the impacts of improved agrometeorological tools and methodologies on services provided to the farm sector.

(b) Communication of Agrometeorological Products and Services

The current means of communication of agrometeorological products and services to the farming sector in different regions, e.g. WAMIS will be reviewed. The needs for improving the current systems of communication of agrometeorological products and services for promoting sustainable agriculture will be identified. The feasibility of implementing new and/or appropriate tools for communication and dissemination of agrometeorological products and services will be evaluated and their application will be promoted. The socio-economic and environmental impacts of these new tools on agriculture in different regions will be evaluated.

**Key performance targets include :**

- Providing guidelines and procedures for improved communication of agrometeorological products and services by 2010;
- Documentation on the impacts of improved tools and methodologies for communication of agrometeorological information on agricultural production in different Regions by 2011.

3.3 Climate change/variability and natural disasters in agriculture

(a) Climate Risks in Critical Areas: Agrometeorological Coping Strategies

The critical areas where the agricultural production is sensitive and vulnerable to climate change/variability in different Regions will be determined. The status of mitigation and adaptation strategies with respect to impacts of climate change/variability in critical areas will be summarized. The status of coping with climate risks in agriculture, rangelands, forestry and fisheries in critical areas in the different Regions will be summarized. Current capabilities in the analysis of climate risks and adaptation strategies in critical areas will be appraised. The status of progress in the project on "Climate Forecasts for User Communities" in agriculture, rangelands, forestry and fisheries will be assessed.

**Key performance targets include:**

- Documentation on critical areas to climate variability/change in different Regions and effective coping strategies in these Regions by 2011;
- Providing guidelines and procedures for the analysis of climate risks and adaptation strategies in critical areas by 2011.

(b) Drought and Extreme Temperatures: Preparedness and Management for Sustainable Agriculture, Rangelands, Forestry and Fisheries

The impacts of increasing frequency and severity of droughts and extreme temperatures around the world will be reviewed and assessed so as to minimize damage to agriculture, rangelands, forestry, and fisheries. The current status of monitoring and predicting droughts including the use of drought indices in different Regions will be assessed and recommendations will be made on the ways and means of improving drought monitoring and prediction. The status of drought preparedness and drought coping strategies will be summarized and the current capabilities in the analysis of extreme temperatures and their impacts on sustainable agriculture will be reviewed. The strengths and weaknesses of existing national drought policies will be

reviewed and recommendations will be made on the different ways and means to establish and strengthen policy guidelines

**Key performance targets include:**

- Documentation on ways and means to improve drought monitoring and prediction in different Regions by 2011;
- Publication of a review on the analysis of extreme temperatures and their impacts on agriculture by 2010;
- Providing guidance material on establishing and strengthening drought policy guidelines by 2009.

**AGENDA ITEM 8(1) – REVIEW OF TECHNICAL REGULATIONS AND OF THE GUIDE TO AGRICULTURAL METEOROLOGICAL PRACTICES**

**CAGM-XIV /Rep. 8(1)**

**PROGRESS/ACTIVITY REPORT OF THE MANAGEMENT GROUP**

1. By Resolution 3 (CAGM-XIII) (*see reference 1*) the Commission established the Management Group (MG) with specific terms of reference and with Dr Ray Motha, president of CAGM as the chairman of the group. Members of the group included Mr L.E. Akeh (Nigeria), Dr P. Doraiswamy (USA), Mr H. Abdalla (Sudan), Professor G. Maracchi (Italy), Dr O. Brunini (Brazil), Dr M.J. Salinger (New Zealand), Ms Wang Shili (China), Prof. C.J. Stigter, and Dr W. Baier (Canada).

2. The first meeting of the MG was held Washington DC, USA, from 3 to 6 June 2003. The group reviewed the progress in the implementation of the recommendations of CAGM-XIII and discussed the operational aspects of the new structure for CAGM (*see reference 2*) and the priorities for the Commission's work programme, including the plans for the different Open Programme Area Groups (OPAGs). The group reviewed the report of the president of the Commission, including representation at the Meetings of the Presidents of Technical Commissions and at the sessions of Cg-XIV and EC-LV and expressed its satisfaction with the outcomes at these sessions for the Commission. The group examined the reports of the chairs of the three OPAGs including the activation of the different Expert Teams (ETs) and Implementation/Coordination Teams (ICTs) and the plans for their work. Chairs and co-chairs of the three OPAGs prepared milestone charts/work plans for their groups. The Coordinators for support systems for policy making and for capacity building presented their reports. The group also reviewed the report of the Leader for the Expert Team on the Guide to Agricultural Meteorological Practices and made suggestions on the work plan to complete the Guide. A wide range of other issues was discussed including the new techniques and approaches in receiving and interpreting agrometeorological information, the state of information technology and its application in agricultural meteorology, the World Agrometeorological Information Service (WAMIS) and the International Society for Agricultural Meteorology (INSAM).

3. The second meeting of the MG was held in Guaruja, Brazil from 30 March to 2 April 2004. The group reviewed the progress in the implementation of the new structure of CAGM and discussed the priorities for the Commission's work programme, including the plans for the CAGM-XIV session to be held in October 2006 in New Delhi, India. The group reviewed the report of the president of the Commission and examined the reports of the chairs of the three OPAGs including the reports of the meetings of the different Expert Teams (ETs) and

Implementation/Coordination Teams (ICTs) and the plans for their work. The Coordinator for support systems for policy making presented his report. The group expressed its satisfaction with the progress made in the revision of the *Guide to Agricultural Meteorological Practices* and reviewed the work plan for completion of the revision. Other issues discussed at the session included the preparations for the CAgM-XIV session to be held in New Delhi, including the organization of the International Workshop ahead of the Commission session, WAMIS and INSAM.

4. The MG acknowledged the significant work carried out by the Agricultural Meteorology Division (AGM) during the intersessional period. A number of training workshops, regional technical meetings, roving seminars, and meetings of all the Regional Working Groups on Agricultural Meteorology were organized by AGM (see *reference 3*). AGM responded to an immediate urgent challenge of a locust plague in Africa by convening an Expert Meeting on Meteorological Information for Locust Control in 2004. Subsequently AGM organized two joint Regional Workshops in collaboration with FAO in 2005 and 2006, which led to significant action items on operational meteorological support for locust monitoring for the National Locust Control Centres (NLCCs).

### **AGENDA ITEM 8(3) – REVIEW OF TECHNICAL REGULATIONS AND OF THE GUIDE TO AGRICULTURAL METEOROLOGICAL PRACTICES**

#### **TECHNICAL REGULATIONS**

#### **CAGM-XIV /Rep. 8(3)**

#### **PROGRESS/ACTIVITY REPORT**

1. The general terms of reference of WMO Technical Commissions include a review of the Technical Regulations and the making of proposals for amendments to meet the requirements of the latest developments in science and technology in the field of the Commission (see *reference 1*). This task was included in the terms of reference of the CAgM Management Group (MG) (see *reference 2*). The meetings of the Management Group, held in Washington DC, USA, from 3 to 6 June 2003 and in Guaruja, Brazil, from 30 March to 2 April 2005, made no proposals at this time for any specific amendments to the Technical Regulations.

### **AGENDA ITEM 9(1) – OPAG 1 - AGROMETEOROLOGICAL SERVICES FOR AGRICULTURAL PRODUCTION**

#### **ICT 1.1 AGROMETEOROLOGICAL SERVICES**

#### **CAGM-XIV /Rep. 9(1)**

#### **PROGRESS/ACTIVITY REPORT**

1. A meeting of the CAgM Implementation Coordination Team (ICT) on Agrometeorological Services was held in Manila, Philippines, from 29 to 31 March 2004, at the kind invitation of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA). Eleven participants from 8 countries attended the meeting. The meeting was chaired by Dr Paul Doraiswamy (USA), and Mr Haroun Abdalla (Sudan), chair and co-chair of the ICT.

2. Each regional representative in the ICT discussed the impacts and strategies for implementation at the regional level. The ICT proposed a comprehensive implementation plan for operational agrometeorological services which included the major topics of communication and

awareness, collaboration, training, tools and methods, data and observation, policy and resource mobilization.

3. The following presentations were made by the members of the ICT: Ensuring the availability of accurate, reliable, and systematic procedures and agrometeorological technologies adopted for regionalized services to agriculture (Ms A. Marica, Romania); Developing Farm-Level Strategies in Chile (M. Egaña, Chile); Determination and demonstration of benefits associated with Integrated Crop Management (ICM) techniques in support of agriculture (J. Andresen, USA); Review of proposals for applications to agriculture, rangelands, forestry, and fisheries, and sustainable rural development based on ET Output (N. Van Viet, Viet Nam); and Recommendations on regional training needs (S. Walker, South Africa).

4. The group then discussed the criteria important to their specific regions and prioritized them. The group then discussed the concept notes on possible projects prepared for each region. The concept notes included the following major headings: Title, goals, objectives/deliverables, geographical coverage, implementation plan, and collaborative partners.

5. The following recommendations were made by the ICT:

- (a) Establish effective collaboration/linkages with research organizations/institutions to promote increased operational application of proven modern tools and methods;
- (b) To improve agrometeorological services at the national and regional levels, and to address the issue of personnel turnover, continuous training and education is needed in different regions and countries;
- (c) There is a need to address the issue of the lack of analytical tools and methods such as remote sensing and GIS for agrometeorological services in the developing countries;
- (d) There is a need to enhance collaboration between countries and international centers in different regions to develop projects for strengthening agrometeorological services for improved agricultural production and sustainable development;
- (e) When designing or implementing a new agrometeorological service or product, experts from related agricultural disciplines or perhaps even from the grower community itself should be consulted for advice and/or feedback;
- (f) There is a need to enhance the routine interactions with NGOs, extension services, plant protection personnel, and end-users for strengthening agrometeorological services.

## **AGENDA ITEM 9(2) – OPAG 1 - AGROMETEOROLOGICAL SERVICES FOR AGRICULTURAL PRODUCTION**

### **ET 1.2 WEATHER, CLIMATE AND FARMERS**

#### **CAGM-XIV /Rep. 9(2)**

#### **PROGRESS/ACTIVITY REPORT**

1. The Expert Team on Weather, Climate and Farmers (ETWCF) was established by the Thirteenth Session of CAGM held in Ljubljana, Slovenia in October 2002 (see reference). The membership of ETWCF included Roger Stone (Australia, Leader), René Gommès (FAO),

Arjumand Habib (Bangladesh), Abdoulaye Harou (Canada), Peter Hayman (Australia), Wolfgang Janssen (Germany), Djibrilla Maiga (Mali), and Jurandir Zullo Junior (Brazil).

2. A Meeting of ETWCF was organized in Geneva, Switzerland, from 15 to 18 November 2004. The meeting was co-sponsored by COST Action 718 of the European Science Foundation. Thirty-five participants from twenty-two countries attended the meeting.

3. Nine technical sessions during the meeting covered a wide range of topics including: weather, climate and farmers – challenges and opportunities; use of climate and weather data (including forecasts, products, and advisories) at the farm level; examples of successful application of climate and weather information, data, and forecast systems; methods of enhancing more effective communication (and dialogue for training) between agrometeorological services and farmers; recommendations for improvement in applications of forecasts, advisories, and agrometeorological products; and procedures and guidance for the effective use of agrometeorological systems and information (including climate forecasts and products) for crops, livestock, forestry, and fisheries management.

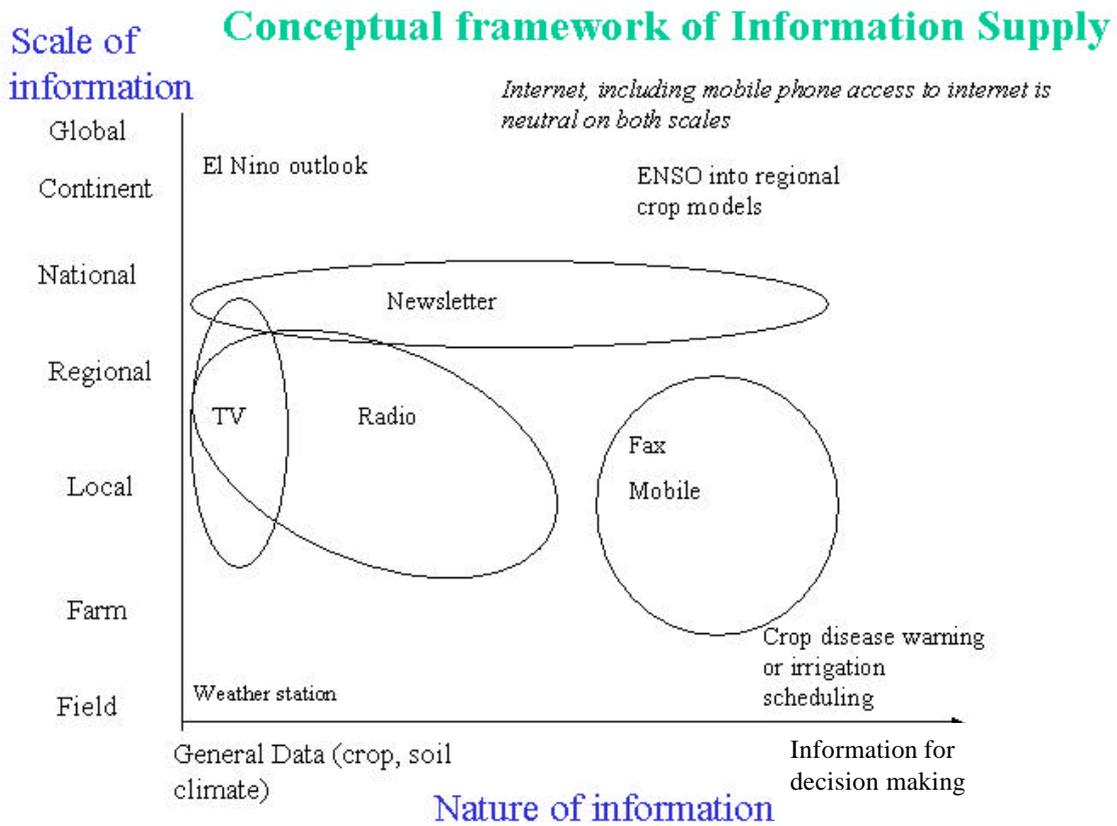
4. In three breakout groups, the participants discussed the following key topics: (a) applications of climate and weather data and forecast systems for agriculture; (b) enhancing communication between agrometeorological services and farmers; and (c) effective use of agrometeorological systems and information at the farm level.

5. Some of the salient recommendations from the meeting are as follows:

- (a) The farming community should be encouraged to more actively apply agrometeorological and seasonal forecast systems to reduce hazard risk and increase crop productivity through a range of appropriate operational decisions;
- (b) Although the skill of forecasts and warnings are increasing, it is recognized that uncertainty will always exist and it is important to collect examples of how skillfully uncertain forecasts and warnings have been effectively applied for risk management;
- (c) With the significant IT advances in agricultural communication, it is recommended that agrometeorologists have a greater interaction with the Implementation Coordination Team (ICT) experts concerning the knowledge of the farmers on benefits of different communication means and available resources;
- (d) There is a strong need for a paradigm shift from supply-driven data to demand-driven information and it is recommended that agromet services work closely with communication experts in researching how this paradigm shift can be achieved;
- (e) Modern web based communication systems such as WAMIS should be taken advantage of by agrometeorologists, especially those who do not have Internet access, to facilitate the exchange of information;
- (f) Agrometeorological information provided by NMHSs is limited by human and financial constraints, therefore it is recommended that agrometeorologists work closely with agricultural extension and research services in order to efficiently target the farming community;
- (g) It is strongly recommended that user feedback be integrated into any communication strategy of agromet services and that guidance material on effective means of conducting feedback be developed and used;

- (h) Agrometeorologists must make an effort to be more visible in the farming community by working closely with them to bring agromet issues into the policy agenda;
- (i) Agrometeorologists should work with farmers to help them understand the importance of global change and climate variability in order to develop appropriate mitigation and adaptation strategies for high impact weather events;
- (j) The research and farmer community should be encouraged to develop more appropriate weather and farming system modelling to minimise environmental losses for sustainable agriculture, foster stronger and wider cooperation among end-users, agricultural extension services, research institutions and data providers (meteorological and hydrological services), and reinforce training and education activities;
- (k) Agrometeorological model applications should be made more interactive so that farmers can use their own observations and site specific conditions for more realistic model outputs.

**Appendix I: Conceptual framework of information supply.**



The y axis represents the scale at which the information is targeted ranging from the field to the globe. The distinction between the national/regional/local levels will depend on the size, regional diversity and resources of the country.

The x axis represents the nature of the information ranging from general data to information for specific decision making. There are many examples where agroclimatological information is targeted at the bottom right hand corner – examples are the management of diseases in horticulture such as downy mildew in grape (Italy) or apple scab (Norway) and irrigation scheduling.

**AGENDA ITEM 9(3) – OPAG 1 - AGROMETEOROLOGICAL SERVICES  
FOR AGRICULTURAL PRODUCTION**

**ET 1.3 STRENGTHENING INFORMATION AND DISSEMINATION NETWORKS, INCLUDING  
MONITORING AND EARLY-WARNING SYSTEMS**

**CAGM-XIV /Rep. 9(3)**

**PROGRESS/ACTIVITY REPORT**

1. The Expert Team on Strengthening Information and Dissemination Networks, including Monitoring and Early Warning Systems (ETSIDN) was established by the thirteenth session of CAgM held in Ljubljana, Slovenia in October 2002 (*see reference*). The membership of ETWCF included Byong-Lyol Lee (Republic of Korea, Leader), Arjumand Habib (Bangladesh), Shrikant Jagtap (USA), Malgorzata Kepinska-Kasprzak (Poland), Chungiang Li (China), Elijah Mukhala (Zimbabwe), Seishi Ninomiya (Japan), Andres Ravelo (Argentina), and Roger Stone (Australia).

2. A Meeting of ETSIDN was organized in Seoul, Republic of Korea, from 22 to 28 September 2003. The meeting was co-sponsored by the Korea Meteorological Administration, the Korean Society of Agricultural and Forest Meteorology, the Yonsei University and ECO 21 of the Ministry of Environment of the Republic of Korea. Eleven participants from nine countries attended the meeting.

3. The meeting reviewed the terms of reference for the ETSIDN established by CAgM and then considered the report of the Leader of the ET. Reports presented by the experts included: Status of information and dissemination networks with delivery systems (S. Jagtap, USA), Gaps in agricultural information to improve agrometeorological analyses (R. Stone, Australia), Guidelines and procedures to standardize the flow of information to farmers (A. Ravelo, Argentina), Better use of technological advances in communication of information (Ms M. Kepinska-Kasprzak, Poland and E. Mukhala, Zimbabwe), Training and education in IT for agrometeorology, RMTIC for IT (Dong-Il Lee, Republic of Korea), Extended sharing of IT resources at the global level (S. Ninomiya, Japan), Perspectives of core agrometeorological stations, KoFlux for Land Surface model (J. Kim, Republic of Korea), Grid Resources and PRAGMA (J.S. Lee, Republic of Korea), MetBroker (M. Laurenson, Japan), Field Server (S. Ninomiya, Japan) and Umeteo-Korea (J. Oh, Republic of Korea). The Meeting recommended the implementation of nine pilot projects to demonstrate the information and dissemination networks.

**AGENDA ITEM 9(4) – OPAG 1 - AGROMETEOROLOGICAL SERVICES  
FOR AGRICULTURAL PRODUCTION**

**ET 1.4 MANAGEMENT OF NATURAL AND ENVIRONMENTAL RESOURCES FOR  
SUSTAINABLE AGRICULTURAL DEVELOPMENT**

**CAGM-XIV /Rep. 9(4)**

**PROGRESS/ACTIVITY REPORT**

1. The Expert Team on Management of Natural and Environmental Resources for Sustainable Agricultural Development (ETMNER) was established by the thirteenth session of CAgM held in Ljubljana, Slovenia in October 2002 (*see reference*). The members of the ET

included: Zoltan Dunkel (Hungary), Gualterio Hugo (Chile), Frédéric Huard (France), Shu-e Huang (China), Brilliant Petja (South Africa), Ashley Leedman (Australia), and Phil Pasteris (USA).

3. A workshop of ETMNER was organized in Portland, Oregon, USA, from 13 to 16 February 2006 at the Natural Resources Conservation Service (NRCS), National Water and Climate Center of the United States Department of Agriculture (USDA). The workshop brought together ET members, as well as experts from the USDA's NRCS and other US government institutions. Twenty-five participants from 9 countries attended the workshop.

4. The workshop reviewed the terms of reference for the ETMNER established by CAgM and then considered the report of the Leader of the ET. Presentations were given by the following ET members and experts: Management of Natural and Environmental Resources for Sustainable Agricultural Development: Regional Diversity and Change (J. Curtis, USA), Soil Climate Analysis Network (SCAN): A Proposed Nationwide Soil-Climate Monitoring Network (G. Schaefer, USA), Assessing the Impact of Natural Resources Management for Sustaining Mountain Farming System in Nepal (K. Sherchand, Nepal), AgACIS – The Agricultural Applied Climate Information System (J. Marron, USA), Hydrologic Simulation Modeling for Streamflow Forecasting and Evaluation of Land and Water Management Practices in the Spague River, Upper Klamath Basin, Oregon (D. Garen, USA), Agrometeorological Perspective for the Conservation of Natural and Environmental Resources in Harmony with Agricultural Production Systems (Z. Dunkel, Hungary), The Australian National Agricultural Monitoring System – An Approach to Climate Risk Management (A. Leedman, Australia), Recent Analysis and Improvements of the Statistical Water Supply Forecasts for the Upper Klamath Lake Basin, Oregon and California, USA (J. Lea, USA), Use of the Object Modeling System for Operational Water Supply Forecasting (T. Perkins, USA), Mapping of Climate Information with PRISM (C. Daly, USA), Spatial Quality Control of SNOTEL and Other Data Networks (C. Daly, USA), Snow Modeling and Observation at NOAA's National Operational Hydrologic Remote Sensing Center (T. Carroll, USA), Trends in Land Degradation (G. Hugo, Chile), Review of Case Studies of Successful Measures to Manage Land Use, Protect land and Mitigate Land Degradation (B. Petja, South Africa), Natural Disaster Reduction in Coastal Lowland Areas (S. Huang, China), Natural Disasters and their Mitigation for Sustainable Agricultural Development (M.V.K. Sivakumar, Switzerland), Weather Technology for Fire Weather Agrometeorology Operations (F. Fujioka, USA) and Disseminating Fire Weather/Fire Danger Forecasts through a Web GIS (A. Wilson, USA).

## **AGENDA ITEM 10 (1) – SUPPORT SYSTEMS FOR AGROMETEOROLOGICAL SERVICES**

### **ICT 2.1 SUPPORT SYSTEMS FOR AGROMETEOROLOGICAL SERVICES**

#### **CAgM-XIV /Rep. 10(1)**

#### **PROGRESS/ACTIVITY REPORT**

1. The Implementation Coordination Team on Support Systems for Agrometeorological Services (ICSAS) of the Open Programme Area Group 2 on Support Systems for Agrometeorological Services was established by the thirteenth session of CAgM held in Ljubljana, Slovenia in October 2002 (*see reference*). The membership of the ICSAS included Giampiero Maracchi (Italy, Chair), Orivaldo Brunini (Brazil, Co-chair), Edna Juanillo (Philippines), Edward Kanemasu (USA), Alexander Kleshenko (Russian Federation), Svetlana Kosakova (Ukraine), and Benjamin Razafindrakoto (Madagascar).

2. A Meeting of the ICT on Support Systems for Agrometeorological Services was held in Florence, Italy, from 25 to 27 January 2006, at the kind invitation of the Institute of Biometeorology

(IBIMET), Florence. Nine participants from nine countries attended the meeting. The meeting was chaired by Drs Giampiero Maracchi and Orivaldo Brunini, chair and co-chair of the ICT.

3. The group reviewed the terms of reference (TOR) of the ICT and discussed how the TORs were approached in different regions. One of the major issues that was addressed concerned the current constraints in the delivery of agrometeorological products and advisories. The group recognized the need to establish partnerships between the private sector and agrometeorological services. This can be demonstrated through case studies on socio-economic benefits of agrometeorological services which were identified for different regions. Dr Federica Rossi, Leader of the Expert Team on Techniques (including technologies such as GIS and Remote Sensing) for Agroclimatic Characterization and Sustainable Land Management (ETAC) made a presentation at the ET meeting held in Bologna in 2005. She referred to various recommendations made at this ET meeting. The Secretariat made a presentation at the meeting of the ET on Database Management, Validation and Application of Models and Research Methods at the Eco-Regional Level (ETDM), which was held in Gaborone, Botswana in November 2006.

4. The group reviewed the recommendations from the meetings of ETAC and ETDM and prioritized them using a group approach. Based on this exercise, the group identified two projects for the ETAC and five projects for the ETDM, for regional implementation.

5. The group then reviewed the Operational Applications of Current Agrometeorological Data, Analytical Tools, and Information Delivery Systems at the National and Regional Levels. One of the major issues that was addressed concerned the current constraints in the delivery of agrometeorological products and advisories.

6. On the issue of recommendations on Procedures, Methodologies and Resources to Improve the Regional-Based Capability for Operational Applications, presentations were made by A. Kleschenko (Russian Federation), O. Brunini (Brazil), E. Juanillo (Philippines) and E. Kanemasu (USA).

## **AGENDA ITEM 10(2) – SUPPORT SYSTEMS FOR AGROMETEOROLOGICAL SERVICES**

### **ET 2.2 TECHNIQUES (INCLUDING TECHNOLOGIES SUCH AS GIS & REMOTE SENSING) FOR AGROCLIMATIC CHARACTERIZATION AND SUSTAINABLE LAND MANAGEMENT**

#### **CAGM-XIV /Rep. 10(2)**

#### **PROGRESS/ACTIVITY REPORT**

1. The Expert Team on Techniques (including technologies such as GIS & Remote Sensing) for Agroclimatic Characterization and Sustainable Land Management (ETAC) was established by the thirteenth session of CAgM held in Ljubljana, Slovenia in October 2002 (*see reference*). The membership of ETAC included Federica Rossi (Italy, Leader), Barnabas Chipindu (Zimbabwe), Jin Yun (Republic of Korea), Eduardo Delgado Assad (Brazil), Felix Kogan (USA), Gregory Laughlin (Australia), and Frédéric Huard (France).

2. To achieve its terms of reference, a Workshop on Climatic Analysis and Mapping in Agriculture was held at the Institute of Biometeorology of the Italian National Research Center in Bologna, Italy, from 14 to 17 June 2005. This workshop, which was co-sponsored by COST Action 718 of the European Science Foundation, brought together members of ETAC as well as experts of COST Action 718 from Europe, and several researchers from Italian institutions operating in agrometeorology (both Research Centers, Universities and Services). Fifty-five participants attended the workshop.

3. Presentations at the workshop were given in the following sessions: (a) remote Sensing, GIS and ground based monitoring technologies to assess land use and surface-atmosphere interactions; (b) mapping technique to forecast extreme events and crop vulnerability; (c) national surveys and pilot projects of agroclimatic mapping and sustainable land management; and (d) procedures and guidance of appropriate zoning methodologies and promotion of their application. Proceedings will be published by WMO.

### **AGENDA ITEM 10(3) – SUPPORT SYSTEMS FOR AGROMETEOROLOGICAL SERVICES**

#### **ET 2.3 EXPERT TEAM ON DATABASE MANAGEMENT, VALIDATION AND APPLICATION OF MODELS, RESEARCH METHODS AT THE ECO-REGIONAL LEVEL**

##### **CAGM-XIV /Rep. 10(2)**

##### **PROGRESS/ACTIVITY REPORT**

1. The Expert Team on Database Management, Validation and Application of Models, Research Methods at the Eco-Regional Level (ETDM) was established by the thirteenth session of CAGM held in Ljubljana, Slovenia in October 2002 (*see reference*). The members of the ET included: Elijah Mukhula (Zimbabwe, Leader), Michele Bernardi (Italy), Orivaldo Brunini (Brazil), Huailang Chen (China), Thelma Cinco (Philippines), Koffi Koussi (Côte d'Ivoire), and Roger Stern (UK).

2. A meeting of ETDM was organized in Gaborone, Botswana, from 21 to 23 November. The Botswana Department of Meteorological Services hosted this ET meeting. Twelve participants from seven countries attended the meeting. Several experts from southern Africa, especially from the Southern Africa Development Community (SADC) also participated and gave presentations.

3. The meeting reviewed the terms of reference for the ETDM established by CAGM and then considered the report of the Leader of the Expert Team. Presentations were given by the following ET members and invited experts: Efficient ways and means of database management including computer technology, standardized analytical techniques and integrated information management systems (R. Stern, UK and K. Kouassi, Côte d'Ivoire), Database Management System at the Botswana Meteorological Service (S. Machua, Kenya), Operational requirements for the validation of selected models in agriculture, rangelands, forestry and fisheries and methodological developments to apply these models at a regional scale (T. Cinco, Phillipines), Needs of agriculture, rangelands, forestry and fisheries in future agrometeorological information management systems (M. Bernardi, Italy), Eco-regional research at the national and regional levels that may serve as models for broader application (H. Chen, China), Status of geospatial data for natural resource management and food security assessment in the SADC Region (T. Magadzire, Botswana), and Meta Data Activities in the SADC Region (D. Nyamhanza, Botswana).

**AGENDA ITEM 11(1) – OPAG 3 - CLIMATE CHANGE/VARIABILITY AND NATURAL DISASTERS IN AGRICULTURE****ICT 3.1 CLIMATE CHANGE/VARIABILITY AND NATURAL DISASTERS IN AGRICULTURE****CAgM-XIV /Rep. 11(1)****PROGRESS/ACTIVITY REPORT**

1. The Implementation Coordination Team on Climate Change/Variability and Natural Disasters in Agriculture (ICCND) of the Open Area Programme Group 3 (OPAG 3) on Climate Change/Variability and Natural Disasters in Agriculture was established by the thirteenth session of CAgM, which was held in Ljubljana, Slovenia in October 2002. The membership of the ICCND included James Salinger, Chair (New Zealand), Shili Wang, Co-chair (China), Emmanuel Cloppet (France), Haripada Das (India), Fulgencio Garavito (Guatemala), Bernard Edward Gomez (Gambia), and Lourdes Tibig (Philippines).
2. A Meeting of the ICT on Climate Change/Variability and Natural Disasters in Agriculture was held in Auckland, New Zealand, from 21 to 23 February 2005, at the kind invitation of the New Zealand National Institute of Water and Atmospheric Research (NIWA). Nine participants from nine countries attended the meeting. The meeting was chaired by Drs James Salinger and Shili Wang.
3. Prior to the meeting, ICT members assessed regional information on the state of climate change/variability studies and impacts, mitigation and adaptation strategies for their Regions. Reports were presented at the meeting of the discussions and recommendations from the three OPAG ETs from which recommendations for implementation were drawn for each of the Regions. The current capabilities in the analysis of climate change/variability and natural disasters were considered and the ability of climate change scenarios and climate variability studies at the regional level to assist agrometeorological adaptation strategies was assessed.
4. Deficiencies in the operational applications of seasonal forecasts for agriculture were identified before a list of recommendations was drawn up on the Terms of Reference for implementation in different Regions. Three potential pilot projects were identified and two new focus areas recommended for the constitution of Expert Teams for the next intersessional period. One of the focus areas recommended for the Commission is on climate Change and Variability, and the other on Natural Disasters.
5. In view of the high complexity of communicating climate related information to non-professionals, as well as the multiplicity of end-users, implementation of a number of actions may significantly contribute to bridge the agricultural and climate science communities. These include:
  - (a) Efforts to accommodate the needs of the various end-users wherever possible;
  - (b) Timely production of forecast products;
  - (c) Need for climate information producers to classify/categorise end-users in order to feed them better;
  - (d) Regular provision of updated products and making them available to the broadest audience possible;

- (e) Need for climate information producers to provide information on the characteristics of season types in terms of length, dates of onset and cessation, frequency of dry spells, chances of flooding, storms, etc.;
- (f) Regular dissemination of weather information especially hazardous weather may help in confidence building;
- (g) Education of end-users to distinguish between short- and longer-term predictions and how these are compiled.

**AGENDA ITEM 11(2) – OPAG 3 - CLIMATE CHANGE/VARIABILITY AND NATURAL  
DISASTERS IN AGRICULTURE**

**ET 3.2 IMPACT OF CLIMATE CHANGE/VARIABILITY ON MEDIUM- TO LONG-RANGE  
PREDICTIONS FOR AGRICULTURE**

**CAGM-XIV /Rep. 11(2)**

**PROGRESS/ACTIVITY REPORT**

1. The Expert Team on the Impact Of Climate Change/Variability On Medium- To Long-Range Predictions For Agriculture (ETCMLP) was established by the Thirteenth Session of CAgM held in Ljubljana, Slovenia in October 2002 (*see reference 1*). The members of the ETCMLP included: Holger Meinke, Leader (Australia), Ismail Demir (Turkey), Josef Eitzinger (Austria), Jürgen Garbrecht (USA), Taslima Imam (Bangladesh), Adriana Marica (Romania), and Alan Porteous (New Zealand).

2. A meeting of ETCMLP was organized from 15 to 18 February 2005 in Brisbane, Australia at the Department of Primary Industries and Fisheries. Twenty-six participants from 9 countries attended the meeting. In addition to the members of the ET, a group of 17 Australian and New Zealand scientists working on climate forecasting and agricultural applications also participated in the meeting.

3. The meeting reviewed the terms of reference for the ETCMLP established by CAgM and then considered the report of the Leader of the ET. Participants gave presentations that exchanged experiences on the value of climate forecasts and their application in agriculture. Specifically, the presentations addressed the current capabilities in climate change/variability analyses and long-range prediction studies related to agriculture, rangelands, forestry and fisheries, the current status of methodologies for the presentation of seasonal to interannual prediction products to agricultural users, applications to the agricultural users and availability of software packages, and research and development activities needed to improve the technology for the benefit of agriculture, rangelands, forestry, and fisheries. A total of 24 presentations were delivered and discussed and the ET then synthesised the important points made during the presentations and developed recommendations for all organisations involved in climate forecast applications.

**AGENDA ITEM 11(3) – OPAG 3 - CLIMATE CHANGE/VARIABILITY AND NATURAL DISASTERS IN AGRICULTURE****ET 3.3 REDUCTION OF THE IMPACT OF NATURAL DISASTERS AND MITIGATION OF EXTREME EVENTS IN AGRICULTURE, FORESTRY AND FISHERIES****CAgM-XIV /Rep. 11(3)****PROGRESS/ACTIVITY REPORT**

1. The Expert Team on Reduction of the Impact of Natural Disasters and Mitigation of Extreme Events in Agriculture, Forestry and Fisheries (ETRND) was established by the thirteenth session of CAgM held in Ljubljana, Slovenia in October 2002 (*see reference*). The membership of ETRND included H.P. Das, Leader (India), Bernard Edward Gomez (Gambia), Rita Guerreiro (Portugal), Liliana Nunez (Argentina), Allen Riebau (USA), William Wright (Australia), and Yanxia Zhao (China).
2. To address its terms of reference, a meeting of ETRND was held in Beijing, China, from 16 to 20 February 2004. Fifty-four participants from eight countries, including forty-five from China, attended the meeting. In addition to the members of ETRND, three experts nominated by JCOMM also participated in the meeting.
3. Nineteen papers were presented on the issue of impacts of natural disasters, disaster prevention and preparedness as they relate to agriculture, rangelands and forestry. Three papers were presented on predictability, early detection, and monitoring of extreme events. Four papers reviewed the impact assessment of natural disasters with particular reference to agriculture and coastal lands and three papers reviewed the adaptation strategy and policy issue associated with natural disasters, particularly drought and significance of training and education. Four papers were presented on the current capabilities in management and mitigation of and preparedness for natural disasters and three papers reviewed the application of remote sensing techniques in early detection and monitoring of natural disasters.
4. Proceedings of the ETRND meeting were published as a book entitled “Natural Disasters and Extreme Events in Agriculture” by Springer (Germany) and copies were widely distributed to all the members.
5. Several meetings and workshops were held in response to the Desert Locust plague in 2004:
  - (a) Expert Meeting on Meteorological Information for Locust Control in Geneva, Switzerland, from 18 to 20 October 2004 in which representatives from FAO, AGRHYMET, Italy, and India participated;
  - (b) WMO/FAO Regional Training Workshop for the Francophone Countries on Meteorological Information for Locust Monitoring and Control, from 18 to 21 April 2005 in Niamey, Niger, hosted by the Regional AGRHYMET Centre. The Workshop brought together experts and representatives of the NMHSs and Locust Control Centres (LCCs) of 11 countries in Africa;
  - (c) WMO/FAO Regional Training Workshop for the Anglophone Countries on Meteorological Information for Locust Monitoring and Control, from 9 to 12 April 2006 in Muscat, Oman. The Workshop was hosted by the Omani Meteorological Department and Ministry of Agriculture. The Workshop brought together experts and representatives of NMHSs and National LCCs of 11 Anglophone countries in North-eastern Africa and South-western Asia.

6. Progress has been made with respect to the development of a new cross-cutting WMO DPM Programme:

- (a) Fourteenth Congress (Geneva, May 2003) through Resolution 29 decided to initiate a major crosscutting programme on Natural Disaster Prevention and Mitigation (DPM);
- (b) EC-LVI (Geneva, June 2004) established the Executive Council Advisory Group on Disaster Prevention and Mitigation (EC AG DPM) providing a mechanism for review and advise on development of WMO DPM;
- (c) EC-LVII (Geneva, June 2005) endorsed the recommendations of the First Meeting of the EC AG DPM (Geneva, March 2005) and adopted the Revised Implementation Plan of DPM Programme;
- (d) EC-LVIII (Geneva, June 2006) established a clear crosscutting framework involving the WMO Scientific and Technical Programmes, Technical Commissions (TCs), Regional Associations (RAs) and strategic partners.

7. The DPM-related coordination structure within WMO has progressed as follows:

- (a) In the Secretariat, the Steering Committee for Disaster Reduction (SCDR) has been established; involving Directors to provide guidance on crosscutting DPM related activities of their Programmes;
- (b) The DPM Programme Department is responsible for coordination and facilitation of the process to identify strategic priorities and related crosscutting projects and activities that are implemented through the WMO Scientific and Technical Programmes, Technical Commissions, Regional Associations and partners;
- (c) All WMO Scientific and Technical Departments have established DPM focal points;
- (d) As of July 2006, WMO Permanent Representatives have nominated 141 National DPM focal points;
- (e) As of July 2006, RAs II, IV, V, and VI have established regional DPM Working Groups;
- (f) As of July 2006, CBS and CIMO have formally designated their DPM focal points or coordinators within their Management Group. CAgM, CAeM, CCI, JCOMM, and CHY have designated interim DPM focal points until a focal point is formally established through the Commission.

8. The Third Early Warning Conference (EWC-III) held in Bonn, Germany, from 27 to 29 March 2006, selected a project entitled "Early Warning Systems for Desert Locusts – A West Africa Pilot Project" prepared by the Agricultural Meteorology Programme (AGMP) as one of the 15 projects for presentation in the Plenary Segment of the Conference. The presentation and discussion of the project was held during the plenary session on 29 March 2006, which was moderated by Sir Trevor McDonald. The presentation highlighted introduction to locusts and the damage caused by them; importance of meteorological information for locust monitoring and control; technological advances and operational tools in meteorology that facilitate locust monitoring and prediction; the objectives of the West Africa pilot project; and technology transfer. Following the presentation, several delegations highlighted the need for more effective early warning systems for locust control in Africa and supported the proposed pilot project. The Département des Relations Extérieures de la Principauté de Monaco expressed an interest in implementing the project in Africa.

9. During the Second World Conference on Disaster Reduction (Hyogo, Kobe, Japan, 18-22 January 2005), 168 countries adopted the Hyogo Framework for Action 2005-2015 (HFA), providing a framework for development of disaster risk management capacities at national, regional and international levels. In HFA five main action areas have been identified for implementation, including:

- (a) Ensure that disaster risk reduction (DRR) is a national and a local priority with a strong institutional basis for implementation;
- (b) Identify, assess and monitor disaster risks and enhance early warnings;
- (c) Use knowledge, innovation and education to build a culture of safety and resilience at all levels;
- (d) Reduce the underlying risk factors;
- (e) Strengthen disaster preparedness for effective response at all levels.

10. AGMP was invited by the Hydrology and Water Resources Programme of WMO to organize a Topic Session on "Managing Drought Risks - Role of Improved Preparedness and Management" at the Fourth World Water Forum held in Mexico City, from 16 to 22 March 2006. The Topic Session was organized in cooperation with the National Drought Mitigation Center (NDMC), University of Nebraska and the United States Department of Agriculture (USDA) on 21 March 2006. This session focussed on risk-based management of droughts and how better preparedness and management strategies can help cope with drought risks. Two local actions were presented in the topic session by Dr Sergio Reyes, CICESE, Mexico on "Desarrollo de proyectos de investigacion cientifica sobre los fenomenos meteorologicos y climatologicos que afectan la region noroeste de mexico" and by Mr Jan van Wonderen, Mott MacDonald, United Kingdom and Dr Adelia Branco, Gender and Water Alliance, Brazil on "Sustainable Use of Water Resources - Role of Environmental Education and Gender Roles".

## **AGENDA ITEM 11(4) – OPAG 3 - CLIMATE CHANGE/VARIABILITY AND NATURAL DISASTERS IN AGRICULTURE**

### **ET 3.4 CONTRIBUTION OF AGRICULTURE TO THE STATE OF CLIMATE**

**CAGM-XIV /Rep. 11(4)**

#### **PROGRESS/ACTIVITY REPORT**

1. The Expert Team on the Contribution of Agriculture to the State of Climate (ETCAC) was established by the thirteenth session of CAgM held in Ljubljana, Slovenia in October 2002 (see *reference*). The members of the ET included: Ray Desjardins, Leader (Canada), Richard Betts (UK), Paulo Caramori (Brazil), Richard Raddatz (Canada), Keith Lassey (New Zealand), Bernard Seguin (France), and Chaodong Zhou (China).

2. A meeting of ETCAC was organized from 27 to 30 September 2004 in Ottawa, Canada, at the Central Experimental Farm of Agriculture and Agri-Food Canada (AAFC). The meeting brought together ET members as well as experts from Agriculture and Agri-Food Canada, Environment Canada, USA, and the United Kingdom. Twenty-five participants from eight countries attended the meeting.

3. The meeting reviewed the terms of reference for the ETCAC established by CAgM and then considered the report of the Leader of the ET. The contribution of agriculture to the state of climate has not been an area of concern in the past because there has been more interest in the impact of climate on agriculture; however, it is now becoming important as we seek to ensure environmental sustainability of agricultural practices. The experts were invited to prepare state-of-the-art presentations on the following topics: agriculture's contribution to climate; assessing feedback mechanisms from human activities; quantifying greenhouse gas emissions from agriculture; improving management practices to reduce GHG emissions and increase C sequestration; and awareness building and education.

4. Topics discussed at the workshop included the development of agriculture, land use change, the interactions between physiological properties of vegetation, ecosystem physical properties and climate, the impact of agriculture on weather and climate, interactive mechanisms resulting from human activities, the acquisition of relevant greenhouse gas (GHG) emission data, and the promotion/adoption of management practices to reduce the impact of agriculture on the environment. Several presentations demonstrated that important biophysical forcing with significant climate feedback exist as a result of agriculture-related land use change.

5. The meeting concluded that biogeochemical forcing is usually treated extensively but that biophysical impacts are not well characterized; and that few studies have included both of these aspects. It was emphasized that human disturbances of the Earth's surface that affect the energy budget might be as important climatologically as GHG emissions arising from land disturbance. It was suggested that current GHG mitigation practices should be reassessed to account for both the biogeochemical and the biogeophysical forcing, and that there are significant opportunities and risks that occur due to the complex interactions between agriculture and the environment.

## **AGENDA ITEM 12(1) – ETs REPORTING DIRECTLY TO THE PRESIDENT AND/OR THE MANAGEMENT GROUP**

### **ET ON THE GUIDE TO AGRICULTURAL METEOROLOGICAL PRACTICES**

**CAgM-XIV /Rep. 12(1)**

#### **PROGRESS/ACTIVITY REPORT**

1. The Expert Team on the Guide to Agricultural Meteorological Practices (ETGAMP) was established by the Thirteenth Session of CAgM held in Ljubljana, Slovenia in October 2002 (see *reference 1*). The members of the ET included: with Prof. C.J. Stigter, Leader (Netherlands), Dr H. P. Das (India), Prof. A. Garcia (Brazil), Dr R. Gommès (Italy), Dr B.-L. Lee (South Korea), Dr R.K.M. Vasiraju (India), and Mr R. Stefanski (Switzerland).

2. A meeting of ETGAMP was held at the WMO Headquarters in Geneva, Switzerland, from 21 to 23 August 2005. Seven participants from five countries attended the ET meeting.

3. The meeting reviewed the terms of reference for the ETGAMP established by CAgM and then considered the report of the ET Leader. Progress reports were then given by the ET Leader and ET members on their corresponding chapters. The meeting also included a history of the GAMP Revision along with discussions on the appendices and authors.

4. The following is a summary of the progress of the GAMP chapters as of May 2006.

- Completed Chapters already externally reviewed: Chapters 1, 3, 7 (including 16), 11, and parts of 13 (maize, potato)

- Chapters under external review: Chapters 4, 9, parts of 13 (cotton, wheat, groundnut)
- Chapters nearly ready for external review: Chapters 2, 8, 10, parts of 13 (rice, sorghum), 14, 15, 17
- Chapters under internal review: Chapters 6, 12
- Chapters still in writing stage: Chapters 5, 18
- Chapters without authors: part of Chapter 13 (millet)

## **AGENDA ITEM 13 – REPORT OF THE COORDINATOR FOR SUPPORT SYSTEMS FOR POLICY MAKING**

### **CAGM-XIV /Rep. 13**

#### **PROGRESS/ACTIVITY REPORT**

1. The Coordinator for Support Systems for Policy Making was established by the thirteenth session of CAgM held in Ljubljana, Slovenia in October 2002 (*see reference*). Prof. C.J. Stigter (Netherlands) was appointed as the Coordinator.
2. Prof. Stigter gave his first report entitled “Support systems in policy making for agrometeorological services: bringing the work of CAgM OPAGs, ICTs and ETs in a diagnostic and conceptual framework for action support”, at the first meeting of the Management Group of CAgM in Washington, D.C. in June 2003. He stated that the coordinator for policy making in agricultural meteorology should not concentrate on the means, but should concentrate on goals. This implies that the coordinator should concentrate on agrometeorological services as the main goal in agrometeorology. It should be possible to give the work of CAgM OPAGs, ICTs and ETs a not too complicated framework and this will make it easier to see how the actual support systems can work for the establishment of agrometeorological services.
3. During the second CAgM Management group meeting held in Guarujá, Brazil in March 2005, Prof. Stigter gave a presentation on the “Support Systems In Policy Making For Agrometeorological Services: The Role Of Intermediaries”. He explained the diagnostic and conceptual framework of support systems to agrometeorological services. He noted that farmers in developing countries do not get any benefits out of research based extension services that address farmers’ needs. It would help if we create a database of sound and dependable supportive research applications. He noted that CAgM and INSAM should support attempts to strengthen policies as a building block to aim at filling gaps between producers of the products. These policies should improve the adaptation and preparedness of communities to better face social and environmental constraints. One positive influence on agricultural management operations is through the application of agrometeorological services derived from environment based decision systems and innovations from within farming systems. A major problem is insufficient education and training of the user community. Intermediaries should be the ones in direct contact with agricultural communities. The first kind of agrometeorological intermediaries would be close to the centres where the agrometeorological information useful for decision makers in agricultural production is generated. One of the challenges of the Commission is to fill the gaps between the producers of agrometeorological knowledge and the actual agrometeorological services in the livelihood of farmers. Intermediaries need a good education in farmers’ needs as well as in how agrometeorology can be used.

**AGENDA ITEM 14(1) – TRAINING AND EDUCATION MATTERS****EVALUATION OF TRAINING, EDUCATION AND CAPACITY BUILDING  
PROJECTS/PROGRAMMES IN AGROMETEOROLOGY****CAGM-XIV /Rep. 14(1)****PROGRESS/ACTIVITY REPORT**

1. The Coordinator for Capacity Building was established by the thirteenth session of CAgM held in Ljubljana, Slovenia in October 2002 (*see reference 1*) and Dr Wolfgang Baier (Canada) was appointed as the Coordinator. Dr Baier presented a report at the CAgM Management Group meeting held from 3 to 6 June 2003 in Washington DC, USA. Unfortunately, for health reasons, Dr Baier could not attend or prepare a report for the subsequent CAgM Management Group meeting held in March 2005 in Brazil. Dr Baier passed away in January 2006.

2. In the CAgM Management Group meeting held in June 2003, Dr Baier provided a discussion paper on capacity building addressed by UN organizations including WMO and CAgM and recommended coordination measures for education, training and extension services across the three OPAGs. One of his suggestions was that the vice-president would be responsible for the oversight of education/training/extension activities as in the past, whereas the coordinator could be responsible for the oversight of capacity building for all OPAG/ETs, in particular, providing support to CAgM members from developing countries in their efforts to strengthen capacity building. It is expected that the vice-president and coordinator would work closely together as a sub-team advising the president of CAgM on these matters.

**AGENDA ITEM 14(2) – TRAINING AND EDUCATION MATTERS****WMO ACTIVITIES ON TRAINING IN AGRICULTURAL METEOROLOGY****CAGM-XIV /Rep. 14(2)****PROGRESS/ACTIVITY REPORT****Surveying Members training needs and providing guidance**

1. Periodic Surveys provide useful information with respect to the priority training subjects, category and number of personnel to be trained, level of training, teaching language, etc.

2. A revised edition of the Guidelines (WMO-No. 258) was issued during 2002/2003, together with an auxiliary publication WMO/TD-No. 1101; the first volume - Meteorology was translated in Russian, Spanish and French (2003-2005).

3. The Expert Team on Accreditation and Certification in Meteorological Education and Training held its first meeting in Geneva in January 2005; the team reviewed the WMO requirements for the training and qualification of aeronautical meteorological personnel, and drafted a Supplement to WMO-No. 258. The EC Panel of Experts at its extraordinary session in November 2005 suggested that the Supplement should be circulated to all WMO Members to collate any comments and suitably modify the Supplement by April 2006 and communicate it to the Panel Members by May 2006. The Supplement is now in print and will be translated to all working languages of WMO and distributed to all WMO Members before the end of 2006.

### **Training events organized/co-sponsored by WMO**

4. The following training events among others were organized for the benefit of the Commission Members:

- Training Workshop (RA II) on Satellite Remote Sensing and GIS Applications in Agricultural Meteorology, Dehradun, India, 7–11 July 2003;
- Training Seminar (RA I) on Information Technology related to Internet for Agricultural Meteorology, Nairobi, Kenya, 1-5 December 2003;
- Roving Seminar on the Application of Climatic Data for Desertification Control, Drought Preparedness and Management of Sustainable Agriculture, St John's, Antigua, 21-30 April 2004;
- WMO/FAO AGRHYMET Regional Training Workshop for the Francophone Countries on Meteorological Information for Locust Monitoring & Control, Niamey, Niger, 19-22 April 2005;
- WMO/FAO Training Workshop on Remote Sensing and GIS Applications in Agricultural Meteorology for Southern Africa, Gaborone, Botswana, 14-18 November 2005;
- WMO/FAO Regional Training Workshop for the Anglophone Countries on Meteorological Information for Locust Monitoring and Control, Muscat, Oman, 8-12 April 2006.

### **Sharing training resources and promoting distance learning**

5. Four CD-ROMs with training modules prepared by COMET during 2002-2004 were distributed to all WMO-RTCs. A CD-ROM presenting 49 training publications from the WMO ETR "Blue Series" was distributed to all WMO Members. Thirteen training software packages and 58 publications were provided to training institutions and WMO-RTCs in the Region.

6. The ETRP Website was reviewed to include online information about the training courses planned by WMO-RTCs for the current and the following year, as well as specific training guidance and links to web-based training resources in meteorology and hydrology.

### **WMO Regional Training Centres (WMO-RTCs)**

7. The WMO Regional Training Centres continued to offer training at various levels in different fields of specialization. In the area of agrometeorology, the following RTCs are offering courses for the period 2006-2009: Algeria, Argentina, China, Egypt, India, Islamic Republic of Iran, Israel, Italy, Kenya, Niger (AGRHYMET), Nigeria, Philippines, Russian Federation, and Uzbekistan. (See WMO-No. 240, Part V Training Programmes of WMO RMTCs 2006-2007).

### **Awarding and implementation of fellowships**

8. Since the last session of the Commission, WMO has continued to award fellowships in various fields to assist Members in the development and strengthening of trained human resources of their NMHSs. Short-term (less than six months) and long-term fellowships have continued to be effective in assisting where necessary, WMO Members with their training requirements. Supporting funds have come from the UNDP, Trust Funds (TF), the Voluntary Cooperation Programme (VCP(F) and the WMO Regular Budget (RB). The Secretary-General has also made efforts to increase the traditional fellowship financial sources by tapping extrabudgetary resources and new sources of funding for this programme.

9. During 2004 and 2005, about 5% of WMO supported training fellowships were on applied meteorology and agrometeorology.

### **AGENDA ITEM 14(3) – TRAINING AND EDUCATION MATTERS**

#### **SYMPOSIA, SEMINARS AND WORKSHOPS IN AGRICULTURAL METEOROLOGY**

##### **CAGM-XIV /Rep. 14(3)**

##### **PROGRESS/ACTIVITY REPORT**

1. The Commission continued to assign high priority consideration in its agenda to the education and training activities in agricultural meteorology. The CAgM-XIV/Doc. 14(2) gives detailed information on the various WMO training facilities available for agrometeorology (see *reference 1*). The training events carried out during the intersessional period (training seminars/workshops and roving seminars) (see *reference 2*) are included in the document on agenda item 6.
2. One of the significant developments during the intersessional period is the organization of six training events. Preparation and publishing of the training manuals and the organization of the training seminars involved active collaboration with FAO and the Institute of Agrometeorology and Environmental Analysis for Agriculture (Italy). FAO provided financial support for the organization of some of the training events. The training manuals consisting of lecture notes and practical exercises proved quite useful and were well appreciated by the participants in the training events. These training manuals will be continuously updated for future seminars.
3. Two international workshops, one inter-regional workshop, three expert group meetings, and two regional technical meetings were held during the intersessional period on a range of topics of interest to members of CAgM. Proceedings of all these events were published and distributed.
4. Participant's evaluation of the workshops conducted by WMO indicates a high degree of satisfaction with the activities carried out. For example, at the Inter-Regional Workshop on Strengthening Operational Agrometeorological Services (Manila, Philippines, 22-26 March 2004), all the participants responded that the knowledge acquired during the workshop would help them contribute more effectively to their work, and 90% of the participants found the information acquired during the workshop was relevant to their work. Regarding the final rating of the workshop, 95% of the participants rated the workshop as very good to good.

### **AGENDA ITEM 15 – COLLABORATION WITH INTERNATIONAL ORGANIZATIONS**

##### **CAGM-XIV /Rep. 15**

##### **PROGRESS/ACTIVITY REPORT**

1. One of the important ways of ensuring the effective use of agrometeorological knowledge and information is to maintain close collaboration and coordination with the user community. In this context, close collaborative activities have been in progress for more than two decades with UN Organizations such as FAO, UNDP, the Secretariats of the United Nations Convention to Combat Desertification (UNCCD) and the Convention on Biological Diversity (CBD) and other international organizations such as the Global Change System for Analysis, Research and Training

(START) and the International Research Institute for Climate and Society (IRI).

## **IPCC**

2. The Intergovernmental Panel on Climate Change (IPCC) 4th Assessment Report (AR4) will become available in 2007 and will provide comprehensive and up-to-date information about climate change, its causes, impacts and possible response measures based on the latest scientific technical and socio-economic literature. AR4 will consist of three Working Group contributions and a Synthesis Report. In early April 2006, the second draft of Working Group 1's contributions (physical science basis) to AR4 was circulated for review – a process still in progress. Second drafts of Working Group 2 (addressing impacts, adaptation and vulnerability to climate change) and Working Group 3 (mitigating climate change) were delivered. The Report of Working Group 1 will be finalized in early February 2007. The Working Group 2 Report will be completed in early April 2007, the Working Group 3 Report in early May 2007 and the Synthesis Report by mid-November 2007.

## **FAO**

3. WMO collaborates actively with FAO and has participated in the following meetings organized by FAO during the intersessional period:

- (a) 24<sup>th</sup> FAO Regional Conference for Europe, Montpellier, France, 5-7 May 2004;
- (b) 30<sup>th</sup> Session of the Committee on World Food Security, Rome, 20-23 September 2004;
- (c) Workshop on Reducing Food Insecurity associated with Natural Disasters in Asia and the Pacific, FAO Regional Office for Asia and the Pacific (RAP), Bangkok, Thailand, 27-28 January 2005;
- (d) 25<sup>th</sup> FAO Regional Conference for Europe, Riga, Latvia, 8-9 June 2006.

4. FAO's involvement in the activities of CAgM continued during the present intersessional period. FAO co-sponsored the following workshops/seminars organized by WMO:

- (a) Inter-Regional Workshop on Strengthening Operational Agrometeorological Services, Manila, Philippines, 22-26 March 2004;
- (b) Regional Workshop on Meteorological Information for Locust Monitoring and Control, Niamey, Niger, 19-22 April 2005;
- (c) Workshop on Climatic Analysis and Mapping in Agriculture, Bologna, Italy, 14-17 June 2005;
- (d) Training Workshop on Remote Sensing and GIS Applications in Agricultural Meteorology for Southern Africa, Gaborone, Botswana, 14 - 18 November 2005;
- (e) Regional Training Workshop for the Anglophone Countries on Meteorological Information for Locust Monitoring and Control, Muscat, Oman, 8 - 12 April 2006.

## **UNDP**

5. In 1999, WMO was actively involved, along with UNDP/UNSO, in a programme to improve farmer accessibility and use of climate forecasts to strengthen farmer drought preparedness and mitigation. The project preparatory phase involved a literature review, conducting a survey in six

African countries (Ethiopia, Kenya, Mali, Mozambique, Senegal, and Zimbabwe) and planning and designing an International Workshop on this subject. The International Workshop was subsequently held in Kadoma, Zimbabwe, from 4 to 6 October 1999. It was co-sponsored by WMO, UNDP/UNSO, NOAA, USAID, and IFAD. The above activities were summarized in a publication entitled "Coping with Drought in sub-Saharan Africa: Better Use of Climate Information" (see reference 1).

6. In November 2005, UNDP/GEF initiated a project on "Coping with Drought and Climate Change" in four African countries (Kenya, Ethiopia, Mozambique, and Zimbabwe) to support their efforts to develop and pilot a range of coping mechanisms for reducing the vulnerability of farmers and pastoralists to future climate shocks. The project focuses on addressing the impacts of climate change specifically aiming at: (a) piloting community and household drought coping strategies; (b) improving early warning systems; (c) implementing Drought Preparedness and Mitigation policies; and (d) replicating and disseminating successful approaches of adaptation. At the invitation of UNDP, WMO agreed to participate in this project in both the preparatory phase and the project implementation phase.

7. WMO was represented at the First Project Steering Committee (PSC) Meeting of the Project on Capacity-Building in Drought Preparedness in Asia and the Pacific organized by UNDP in Bangkok, Thailand (24 January 2005).

## **UNESCO**

8. The conference on the Future of Drylands was held in Tunis, Tunisia, from 19 to 21 June 2006. WMO provided support to the conference by participating in the organizing committee and by financially supporting a representative from the Cuban Institute of Meteorology to attend the meeting. The conference was sponsored by UNESCO, the Tunisian Ministry of Environment and Sustainable Development, GEF, DDPA, and the Flemish Government of Belgium. Besides WMO, other partner organizations included CMS, FAO, ICSU, IFAD, NORAD, OSS, UN/ISDR, UNCCD, UNDP, UNEP, UNU, and the Office of Arid Land Studies at the University of Arizona (USA).

## **UNCCD**

9. WMO collaborates actively with the Secretariat of the United Nations Convention to Combat Desertification (UNCCD) and participated in a number of meetings related to UNCCD (see reference 2).

10. WMO was represented at the Sixth Conference of the Parties (COP-6) to the UNCCD held in Havana, Cuba (25 August-6 September 2003) and the Seventh Session of the Conference of Parties (COP-7) held in Nairobi, Kenya (17-28 October 2005). For COP-7, WMO produced an Information Brochure on "Climate and Land Degradation" (see reference 3) and a side event on the same topic was held on 18 October 2005 at COP-7. The side event was chaired by H.E. Prof. Mark Mwandosya, Minister of Communications and Transport, Government of Tanzania. H.E. Dr Chris Murungaru, EGH, M.P., Minister of Transport, Government of Kenya gave the welcoming remarks.

11. COP-7 recognized the importance of climatic factors in land degradation and in its Decision on the Programme of Work for the Committee on Science and Technology (CST), the Conference of Parties decided that the priority theme for discussion by the CST at its eighth session will be "The effects of climatic variations and human activities on land degradation: assessment, field experience gained, and integration of mitigation and adaptation practices for livelihood improvement". COP-7 also invited the CST to work in collaboration with WMO and other relevant

organizations to address the interactions between climate, land degradation and livelihood security.

12. In the spirit of implementation of the International Year of Deserts and Desertification (IYDD) in 2006 WMO undertook the following activities:

- (a) COP-7 invited WMO to organize and find the necessary funding for an International Workshop on Climate and Land Degradation in 2006 in the spirit of implementation of IYDD. WMO and the Secretariat of UNCCD are jointly organizing this workshop from 11 to 15 December 2006 in Arusha, Tanzania;
- (b) Given that the priority theme for discussion by the CST at its eighth session includes integration of mitigation and adaptation practices for arresting land degradation, WMO prepared a brochure on "Drought Monitoring: Progress and Challenges" (*see reference 4*);

In cooperation with the Kenya Meteorological Department, a DVD on "Climate and Land Degradation" based on the side event organized by WMO at COP-7 of UNCCD in Nairobi in October 2005 was prepared. The DVD contains a video of the Side Event, the WMO press conference held at COP-7 and also all the PowerPoint presentations made at the Side Event.

13. The UNCCD Secretariat and WMO jointly organized the Second Technical Workshop on the Establishment of a Sub-regional Drought Management Centre for South Eastern Europe in Sofia, Bulgaria (26-28 April 2006). Following the workshop, four countries (Hungary, Romania, Slovenia and Turkey) submitted their proposals to host the Centre and a decision on the country selected to host the Centre will be made at a meeting to be held by the end of September 2006 in WMO.

14. Through his circular letters (*see reference 5*), the Secretary-General kept the Members informed of the latest developments with regard to the Convention and the actions to be taken.

## **CBD**

15. WMO collaborated actively with the Secretariat of the Convention on Biological Diversity (CBD). WMO was represented at the Eighth and Eleventh Meetings of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA-8) to CBD held in Montreal, Canada (10-14 March 2003 and 28 November-2 December 2005).

16. The impacts of climate change on biodiversity are of major concern to CBD. The Conference of Parties (COP) to CBD turned its attention to the potential impacts on biodiversity and ecosystems of the various options for mitigating or adapting to climate change and requested SBSTTA to develop scientific advice on these issues. SBSTTA established an ad hoc technical expert group to carry out an assessment of the inter-linkages between biodiversity and climate change. C/AGM participated in the meeting of this ad hoc group and was a Lead Author of the Technical Report on Inter-linkages between Biodiversity and Climate Change published in 2003 (*see reference 6*). The Report focused primarily on the impacts of climate change mitigation options on Biodiversity, and the links between them, in the context of the Kyoto Protocol.

17. At its seventh meeting in 2004, the COP to CBD welcomed the report and requested its wider dissemination. At the same meeting, in decision VII/15, the Conference of the Parties further requested SBSTTA, as the next stage of its work on the interlinkages between biodiversity and climate change, to develop advice or guidance for promoting synergy among activities to address climate change at the national, regional and international level, where appropriate, including activities to combat desertification and land degradation, and activities for the conservation and

sustainable use of biodiversity. An Ad Hoc Technical Expert Group (AHTEG) was appointed to address these issues.

18. C/AGM participated in the Meeting of the AHTEG on Biodiversity and Climate Change held in Helsinki, Finland (13-16 September 2005) and contributed actively to the preparation of the report of AHTEG. The report of the AHTEG was published as a Technical Report on Guidance for Promoting Synergy Among Activities Addressing Biological Diversity, Desertification, Land Degradation and Climate Change (*see reference 7*).

## **START**

19. AGMP continued its strong collaboration with the Global Change System for Analysis, Research and Training (START) in enhancing applications of climate prediction in agriculture. START, the International Research Institute for Climate and Society (IRI) and WMO co-sponsored the International Workshop on Climate Prediction and Agriculture: Advances and Challenges Geneva from 11 to 13 May 2005. The main objective of the workshop was to review advances in application of seasonal climate prediction in agriculture over the past 5 years, and identify challenges to be addressed in the next 5-10 years to further enhance operational use of climate prediction in agriculture in developing countries. Forty-eight participants from 22 countries participated in the workshop. The workshop recommended the establishment of a CLIMAG Working Group that brings together representatives of the different international agencies, regional organizations and national programmes engaged in promoting climate forecasting applications in agriculture to discuss the future course of action. The CLIMAG Task Force of START, which met after the workshop, designated WMO as the Convenor of the CLIMAG Working Group. Proceedings of the workshop and the papers presented at the Synthesis Workshop (see below) were published as a book by Springer and all the invited papers of the workshop were published in a Special Issue of the Climate Research journal.

20. A Synthesis Workshop of the Advanced Institute on Climatic Variability and Food Security (initiated by START in July 2002) was organized from 9 to 10 May 2005 in WMO, Geneva. The workshop brought together twenty-one participants from 11 countries. Participants in the workshop recommended that a CLIMAG (Climate Prediction and Agriculture) Network be established to promote active cooperation among members in the exchange of information to identify, develop and evaluate suitable methods for the assessment of the impacts of climate variability and climate change in agriculture and to facilitate collaboration. The main objective of the network is to promote communication and interaction between researchers in the areas of climate, agriculture and socioeconomics.

## **IRI**

21. Experts from IRI participated actively in the Regional Technical Meetings on CLIPS and Agrometeorological Applications for the Andean Countries held at the Centro Internacional para la Investigación del Fenómeno El Niño (CIIFEN) in Guayaquil, Ecuador (8-12 December 2003) and at the University of Campinas (UNICAMP) in Campinas, Sao Paulo, Brazil (13-16 July, 2005).

## **European Science Foundation**

22. WMO collaborated actively with COST Action 718 on "Meteorological Applications for Agriculture" of the European Science Foundation. The main objective of the Action is to improve the meteorological applications to agriculture and environment protection by identifying and defining the requirements in terms of scale and time resolution and end-users' needs. In addition the Action will demonstrate the practicality of such applications to management and planning of agriculture sector at the national/regional/local level.

23. COST Action 718 co-sponsored two WMO events: the Meeting of Expert Team on Weather, Climate and Farmers held in Geneva, Switzerland (15-18 November 2004) and the Workshop on Climatic Analysis and Mapping in Agriculture held at the Institute of Biometeorology of the Italian National Research Center in Bologna, Italy (14-17 June 2005) and also provided financial support in publishing the proceedings of these two events.

24. WMO was represented at the Meeting of the Management Committee (MC) of COST Action 718 held in Brussels (4-5 March 2004). C/AGM delivered a lecture entitled "Satellite Remote Sensing and GIS Applications in Agricultural Meteorology and WMO Satellite Activities" on 30 September 2005 at the Summer School on Applications of GIS in Meteorology and Climatology of COST Action 719 of the European Science Foundation.

### **ACMAD**

25. AgMP continued its collaborative activities with the African Centre of Meteorological Applications for Development (ACMAD) located in Niger. C/AGM is a member of the Scientific Advisory Committee (SACOM) of the African Centre of Meteorological Applications for Development (ACMAD). SACOM advises the governing council of ACMAD on all scientific and technical aspects of ACMAD's programmes. C/AGM participated in the seventh (Niamey, 14-17 September 2004) session of SACOM. A number of issues including the evaluation of the current programmes of ACMAD, implementation plans for 2005-2006, and nomination of senior professional staff were discussed at this meeting.

### **ICID**

26. The Working Group on Irrigated Agriculture under Drought and Water Scarcity (WG-IADWS) of the International Commission of Irrigation and Drainage (ICID) met at the 19<sup>th</sup> International Congress of ICID held in Beijing, China, 11-14 September 2005. The objectives of the WG-IADWS is to identify and study the phenomena of drought and water scarcity in the context of irrigated agriculture and to provide guidelines for the formulation of policies and decision support strategies for the management and utilization of water resources for irrigation under conditions of drought and water scarcity.

### **Other Organizations**

27. WMO participation in meetings of other organizations was reported in CAgM-XIV/INF. 2.

## **AGENDA ITEM 16 – REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE COMMISSION AND OF RELEVANT EXECUTIVE COUNCIL RESOLUTIONS**

### **CAgM-XIV /Rep. 16**

### **PROGRESS/ACTIVITY REPORT**

4. In accordance with Regulation 189 of the General Regulations (*see reference 1*), technical commissions, at their sessions, should normally review their previous resolutions and recommendations and the relevant Executive Council resolutions. The aim in reviewing the past resolutions and recommendations and their state of implementation is to enable the Commission to prepare, by the end of the session, a coordinated set of decisions, brought up-to-date in the light of the latest developments regarding each subject.

### **Resolutions of the Commission**

2. In accordance with Regulation 32 of the General Regulations (*see reference 1*) working groups are established (rapporteurs are appointed) to act until the following session of the constituent body concerned. Therefore, the resolutions adopted by the Commission for this purpose at CAgM-XIII become automatically obsolete at CAgM-XIV, and the establishment of Expert Teams or rapporteurs should be made by the new resolutions. The one remaining resolution referred to the above, which deals with the review of previous resolutions and recommendations, becomes similarly obsolete at the time of CAgM-XIV, and should be replaced by a new resolution as a result of the review to be carried out by the session.

### **Recommendations of the Commission**

3. A recommendation, by definition, is a decision of a body that requires approval by a higher body before implementation (*see reference 1 - Definitions*). The past recommendations of the Commission have all been examined by the Executive Council and either incorporated in a resolution of the Executive Council or simply approved for implementation. Thus, from the procedural point of view, these recommendations cease to be a concern of the Commission. However, the Commission may wish to review the action taken on these past recommendations, and, if it considers that the results, which it had in mind when passing the recommendations have not been produced or that there is a need to propose modification on the earlier proposed action, a new recommendation on the same subject may be prepared.

4. In connection with the formulation of resolutions and recommendations by the Commission, attention is invited to the instructions on the subject, which are contained in Regulation 180 of the General Regulations (*see reference 1*).

### **Resolutions of the Executive Council related to the field of activity of CAgM**

5. In reviewing past Executive Council resolutions, the principles listed below should be followed (*see reference 2*):

- (a) Past resolutions be incorporated as far as possible in any subsequent resolution taken on the same subject; resolutions thus incorporated will not be kept in force;
- (b) As far as appropriate, the substance of the Executive Council resolutions should be included in an appropriate publication of the WMO;
- (c) Resolutions that are partly obsolete should be replaced by revised texts containing only those parts, which are maintained.

### **Procedure for carrying out the review**

6. In accordance with the directives of the Executive Council (*see reference 2*), the resolutions and recommendations to be reviewed should be examined during the study of the corresponding agenda items, and each working committee should make specific proposals regarding the action to be taken by the Commission on those past resolutions and recommendations relevant to the agenda items allocated to it; these proposals should be included in the working committee's reports to plenary.

7. To help the Commission in carrying out the required review, lists of resolutions and recommendations concerned, with suggestions regarding the action to be taken on each of them, are given on pages 3 and 4 of this Appendix. The results of the review could be suitably recorded in the formats given in Appendices B and C of CAgM-XIV/Doc. 16.

**SUGGESTED ACTION FOR THE REVIEW OF PREVIOUS RESOLUTIONS AND  
RECOMMENDATIONS OF THE COMMISSION ADOPTED PRIOR TO THE THIRTEENTH  
SESSION**

<b>Resolutions / Recommendations</b>	<b>Title</b>	<b>To be considered under agenda item</b>	<b>Action proposed</b>
Res. 1 CAgM-XIII	Review of Previous Resolutions and Recommendations of the Commission for Agricultural Meteorology	16	To be replaced
Res. 2 CAgM-XIII	Working Structure of the Commission for Agricultural Meteorology	17	To be replaced
Res. 3 CAgM-XIII	Management Group of the Commission for Agricultural Meteorology	17	To be replaced
Res. 4 CAgM-XIII	Open Programme Area Groups of the Commission for Agricultural Meteorology	17	To be replaced
Rec. 1 CAgM-XIII	National Progress Reports Made in Agricultural Meteorology	4	To be replaced
Rec. 2 CAgM-XIII	WMO Activities on Training in Agricultural Meteorology	14(2)	To be replaced
Rec. 3 CAgM-XIII	Review of Resolutions of the Executive Council Based on Previous Recommendations of the Commission for Agricultural Meteorology	16	To be replaced with a new recommendation

**SUGGESTED ACTION FOR THE REVIEW OF RESOLUTIONS OF THE EXECUTIVE COUNCIL  
STILL IN FORCE AND RELEVANT TO THE CAgM ACTIVITIES**

<b>Resolutions</b>	<b>Title</b>	<b>To be considered under agenda item</b>	<b>Action proposed</b>
Res. 5 (EC-LIV)	Drought and Desertification	16	To be replaced
Res. 6 (EC-LIV)	Training and Education in Agricultural Meteorology	16	To be replaced

**AGENDA ITEM 17 – REVIEW OF CAgM TERMS OF REFERENCE AND STRUCTURE**

CAgM-XIV /Rep. 17

**PROGRESS/ACTIVITY REPORT****1. PROGRESS/ ACTIVITY REPORT FOR THE PERIOD – 2002-2006**

<b>Expected results</b>	<b>Performance indicators</b>	<b>Activity and Progress Report Related to the Expected Results November 2002 – August 2006</b>
<p><b>17.2</b> Review of existing and establishment of new CAgM OPAGs, Expert Teams, including ToRs for each</p>		
<p>The CAgM Management Group was tasked with keeping under review the internal structure and working methods of the Commission, and to assess and evaluate progress achieved in the work of the OPAGs. The OPAG chairs were to report on progress and assessments regularly to the CAgM Management Group.</p>	<p>Regular reports of the OPAG chairs, assessment of the results by the CAgM MG, and decisions regarding structure and priorities of the Commission for the next intersessional period.</p>	<p>At its thirteenth session, the Commission for Agricultural Meteorology (CAgM-XIII, October 2002) adopted a new working structure through Resolution 2 CAgM-XIII; established a CAgM Management Group (CAgM MG) through Resolution 3 CAgM-XIII; and established three Open Programme Area Groups (OPAGs) through Resolution 4 CAgM-XIII, on Agrometeorological Services for Agricultural Production; Support Systems for Agrometeorological Services; and Climate Change/Variability and Natural Disasters in Agriculture. The Annex to Resolution 2 described the role and functions of the CAgM MG, the OPAGs, the Implementation/Coordination Teams (ICTs), the liaison between the CAgM and the regional associations and the role of developing countries in the work of the Commission.</p> <p>As part of their assessment and reporting function, the Chairs of the CAgM OPAGs evaluated the performance of the working structure of the Commission, and recommended amendments to improve it. This included structural changes, and changes to the Terms of Reference of the teams, to reflect priorities for the work, and practical matters including available resources to carry out the work in an efficient manner. In April 2005, the CAgM Management Group agreed on a revised structure for the Commission, and this is reflected in Doc. 17, and in its three resolutions and Annexes.</p>

