



**WORLD METEOROLOGICAL ORGANIZATION**

**INFORMAL PLANNING MEETING ON THE  
VOLUNTARY CO-OPERATION PROGRAMME (VCP) AND  
RELATED TECHNICAL CO-OPERATION PROGRAMMES**

**Tokyo, Japan, 8-11 March 2005**

**FINAL REPORT**

## GENERAL SUMMARY OF THE WORK OF THE MEETING

### 1. OPENING OF THE MEETING (*Agenda item 1*)

1.1 The 2005 Informal Planning Meeting (IPM) on the Voluntary Co-operation Programme (VCP) and related Technical Co-operation Programmes was held at the Japan Meteorological Agency, Tokyo, Japan, from 8 to 11 March 2005. The meeting was attended by 20 participants representing 14 WMO Members and three collaborating technical co-operation organizations, as well as the Chairman of the EC Advisory Group of Experts on Technical Co-operation. The list of participants is given in Annex I to this report.

1.2 The meeting was opened at 10.00 a.m. on 8 March 2005. Mr Koichi Nagasaka, Permanent Representative of Japan with WMO, welcomed all participants to the Japan Meteorological Agency (JMA), and was pleased to note that this was the first occasion that the Informal Planning Meeting had been held in RA II. He expressed his gratitude for the excellent work traditionally carried out over many years by the EC Panel on the VCP and the Informal Planning Meeting on the VCP. Mr Nagasaka informed that further to the contribution to the WMO Voluntary Co-operation Programme by Japan over the last three decades, it has actively implemented technical co-operation in the national scheme operated by the Japan International Cooperation Agency (JICA), who, from 1995-1998 supported the enhancement of RSMC Nadi for Tropical Cyclones; in 2003 and 2004, offered the establishment of the upper-air observation network and meteorological telecommunication facilities in Mongolia; and is now providing technical co-operation on the installation of a meteorological radar system and a satellite data receiving/analysis system in Lao People's Democratic Republic. Mr Nagasaka stated that further efforts would be made for the improvement and enhancement of meteorological services of the world. Mr Nagasaka expressed his condolences to the victims of the Tsunami that occurred in December 2004, an event which has renewed awareness of the severity of natural hazards and, at the same time, the urgent need to reinforce the activities for disaster prevention and mitigation. Mr Nagasaka informed that as one of the follow-up actions of the UN World Conference on Disaster Reduction, the JMA and the Pacific Tsunami Warning Center in Hawaii would jointly initiate the provision of the Tsunami Watch Information for the region, and that the JMA would actively contribute to the enhancement of the Tsunami early warning capability in the region. Finally, Mr Nagasaka wished the participants a fruitful and successful meeting and assured them of the full support of the JMA staff.

1.3 On behalf of Mr M. Jarraud, Secretary-General of WMO, Dr Rodolfo A. de Guzman, Acting Director of the Regional and Technical Co-operation Activities for Development Department (RCD) added his welcome and thanks to the participants to the meeting, as well as expressed his gratitude to Mr K. Nagasaka for hosting the meeting, the arrangements made and the hospitality extended. He expressed appreciation to the participants and the countries they represented for their contribution to the realization of the WMO goals, particularly relating to the Technical Co-operation Programme. He noted that the programmes and activities realized through the VCP should be seen as contribution to the implementation of the Sixth WMO Long-Term Plan, together with its vision, desired outcomes and strategies. These, together with the work and results of the IPM, should be seen in the light of the Members' desire to have a more proactive, responsive and relevant Organization. He also underscored the importance of viewing these in the context of the very significant social and economic benefits of meteorological, hydrological and related services. Moreover, he encouraged exploring additional resources in support of VCP and other technical co-operation activities in general, from other national institutions like those responsible for overseas development assistance, regional development banks and international financing institutions.

1.4 The Chair, Dr V. Tsui (Australia), congratulated Japan for the successful launch of MTSAT-1R on 26 February 2005. He reported on his participation at EC-TC 2004 and EC-LVI on behalf of IPM. He pointed out that by coming to Tokyo, the IPM had now been convened in five out of the six WMO Regions (apart from Africa). Finally, he praised the late Mr Harouna Diallo, former Director of the WMO Technical Co-operation Department, and of the Regional and Technical Co-operation Activities for Development Department for his immense contributions to VCP.

## **2. ORGANIZATION OF THE MEETING** (*Agenda item 2*)

### **2.1 Adoption of the agenda** (*Agenda item 2.1*)

2.1.1 The agenda adopted is given in Annex II to this report.

### **2.2 Working arrangements** (*Agenda item 2.2*)

2.2.1 The meeting agreed on its working hours and to its work programme during the session.

## **3. EVALUATION OF THE VCP AND RELATED TECHNICAL CO-OPERATION ACTIVITIES IN 2004** (*Agenda item 3*)

### **3.1 Evaluation of VCP activities in 2004**

#### ***Support to VCP projects***

3.1.1 The meeting reviewed the Members' contributions to the VCP in 2004 given in Annex III and the evolution of the support to the VCP over the past 20 years given in Annex IV. It noted that the total yearly contribution in 2004 increased compared to that in 2001-2003.

3.1.2 The meeting noted that in 2004, 49 VCP projects (excluding requests for fellowships) were newly circulated amongst donor Members and, out of about 340 valid outstanding projects circulated during the past five years, 26 VCP projects obtained partial or full support. The support received for these projects grouped by fields of co-operation during the period 1988-2002, and in 2004 is given in Annex V.

3.1.3 During 1988-2004, a total of 1,541 VCP projects was circulated amongst donors. About 48% of the VCP projects received support: VCP projects related to surface observing stations, upper-air observing stations, telecommunication systems, CDMS and climatological activities, and meteorological applications activities (including Aeronautical Meteorology and Public Weather Services Programmes) have received a high level (48-62%) of support, while those for weather radar stations and GAW activities received a lower level (7-22%) of support. In 2004, VCP projects for upper-air observing stations (in particular under co-ordinated projects for GCOS upper-air network stations) and for the modernization of telecommunication systems received more support.

#### ***Support to education and training fellowships***

3.1.4 The meeting was informed that during 2004, a total of 76.7 person x months of fellowships of different durations was awarded to fellows under the VCP and 327.5 person x months under the Regular Budget (RB) with the VCP. The meeting further noted that other efforts were made by Members for training, in particular for long-term fellowships, and

requested the Secretariat to encourage Members to provide full information for distribution to other Members.

### ***Effectiveness of the Voluntary Co-operation Programme***

3.1.5 The meeting was pleased to note that new TCO and VCP web pages have been developed and made available ([www.wmo.int/web/tco](http://www.wmo.int/web/tco) and [www.wmo.int/web/tco/vcp](http://www.wmo.int/web/tco/vcp)), with a new look, in March 2004 in collaboration with Weathernews Inc., Japan, which enabled easier access to the necessary information. The VCP web pages have been regularly updated during 2004. The distribution of VCP-related documents and publications continued to be made in 2004 through the Internet and in print. Full information on VCP project requests circulated in 2000, 2001, 2002, 2003 and 2004; Consolidated Report on the VCP; Consolidated List of Projects and Status of Implementation; a PDF version of the VCP Brochure; as well as Guidelines for submission of requests and Request Forms are now accessible on the VCP Home Page. With appreciation for the Secretariat efforts, in view of the usefulness of the on-line information and materials for publicity and resource mobilization, the meeting encouraged the Secretariat to continue to increase the availability of on-line information on the VCP and related technical co-operation activities.

### ***Evaluation of VCP projects***

3.1.6 The meeting expressed its appreciation to the sub-group, established by the 2003 IPM, composed of representatives of France, UK, USA, WMO and the IPM Chairman, for the completion of the revision of the evaluation report form, given in Annex VI, which would further improve the evaluation report process. The revised evaluation report includes: summary of outcomes; assessment (quantified if possible) of the means of verification; unforeseen consequences; and follow-up activities or projects for sustainability. The meeting further noted that the sixth evaluation of VCP projects completed in the last five years would be carried out in July-October 2005 using the revised evaluation form. In this connection, a WMO circular letter informing of the revision of VCP Rules and VCP request and evaluation forms has been sent to Members in February 2005, with guidance for the preparation of the new VCP request form.

3.1.7 The meeting noted that a simpler questionnaire continued to be sent to recipient countries in 2004 requesting information on the completion, expected results, degree of satisfaction to the arrangements (for delivery and training), etc. for supported projects. Replies were received from a number of countries giving updated useful information for monitoring and evaluating VCP projects.

### ***VCP co-ordinated programmes***

3.1.8 The meeting was informed of the various activities of VCP co-ordinated programmes carried out during 2004 (as given in Annex VII).

3.1.9 The meeting noted that a number of activities continued to be carried out at ACMAD with the support of partners and based on the approved work programme for 2004 and 2005. It noted, in particular, the capacity building activities, including the organization of regional fora of seasonal forecast and its applications; training sessions in the field of climate prediction; and the second capacity building workshop for Directors of NMSs on resource mobilization and strategic plan design and implementation (ARCADIA-02) held in Nairobi, Kenya in April 2004 for English-speaking countries. The meeting also noted that ACMAD explored new opportunities for opening new perspectives for the benefit of African NMSs and the international meteorological community. The meeting encouraged Members to continue their support to relevant ACMAD activities.

### ***Utilization of the Voluntary Co-operation Fund (VCP(F))***

3.1.10 The meeting was informed of the provisional status of the VCP(F) at the end of 2004. In 2004 eight Members made cash contributions amounting to about US \$213,400 to

the VCP(F). The expenditure and obligations for approved projects amounted to about US \$230,000 in 2004. The funds were used mainly for expert services, short-term fellowships, TCDC activities, and high priority programmes, in particular for support to upper-air and surface observing stations, for the improvement of GTS, support to CDMS and climatological activities, operational hydrology activities, and emergency assistance activities, in accordance with the guidelines approved by EC-XLVIII. The meeting was concerned about the uncommitted balance in the VCP(F) and felt that the management of the VCP(F) should aim to use as much of this as possible for project support, thus improving the turnover, which should attract more donor contributions to the VCP(F).

### ***WWW Implementation Support Revolving Fund***

3.1.11 The meeting noted that since its establishment in 1985, the WWW Implementation Support Revolving Fund of the VCP has permitted the provision of urgent assistance to Members of WMO for the operation and the maintenance of WWW facilities through loans for the purchase of spare parts and consumables for a total amount not exceeding US \$10,000 per loan. During the period 1985-2000, 27 loans were granted to 21 countries for temporary assistance to purchase spare parts and consumables for continued operation of existing vital WWW key elements. In 2004, Egypt utilized the Revolving Fund for the purchase of electric recording charts for an anemograph. The status report of the Fund as at 31 December 2004 is given in Annex VIII. A WMO circular letter encouraging the use of the Fund will be distributed to Members in May 2005.

### ***Funding of projects - resource mobilization for the VCP***

3.1.12 The meeting expressed its appreciation to the efforts of the VCP programme manager for resource mobilization for the VCP by convincing potential donors for the VCP in Japan including the private sector. The meeting was pleased to note that the Presidents of TOTEX Corporation, EKO Instruments Trading Co. Ltd, and Koshin Electric Co. Ltd, confirmed their continued support in kind for the WMO VCP by providing meteorological balloons, solar radiation instruments and an anemometer, respectively in 2005 for countries seeking support. During the missions by the VCP programme manager, to Kenya and China, the VCP Programme was promoted with English-speaking African countries and China.

3.1.13 The meeting recognized that there are a number of opportunities for mobilizing resources and working together at country level with other organizations and the private sector. It considered that in the case of donation by the private sector, ownership should be clarified and maintained within the recipient country.

## **3.2 Review of other related technical co-operation activities in 2004**

### ***WMO Technical Co-operation Activities in 2004***

3.2.1 The meeting was informed that the WMO technical co-operation activities continued to be carried out in 2004 within the framework of the WMO Voluntary Co-operation Programme (VCP), Regular Budget co-operation activities, and other components of the Programme, such as Trust Funds; the United Nations Development Programme (UNDP); the Global Environment Facility (GEF); the World Bank; regional development banks; and others. Special efforts have been made to explore new sources of funding and to establish new linkages with various agencies and organizations as well as the private sector.

3.2.2 The meeting was further informed that total technical assistance activities during 2004 amounted to US \$20.51 million, of which US \$8.57 million was from the Voluntary Co-operation Programme, US \$3.32 million was from the UNDP, US \$7.89 million was from Trust Funds and approximately US \$0.72 million was from the WMO regular budget. The list of on-going UNDP and Trust Fund projects is given in Annex IX.

***UNDP and related activities***

3.2.3 The meeting was informed that in Libyan Arab Jamahiriya, within Phase II of the project aimed at enhancing the capacity of the National Meteorological Centre (NMC), six automatic weather stations, an integrated terminal weather system for Tripoli airport and a calibration and maintenance workshop were installed. Related training activities were conducted for the staff members. Five staff members of NMC completed an MSc/Diploma course at the University of Reading in UK. A new contract for Phase III.A of the project was signed in July 2004 to enhance the meteorological infrastructure and human resources of NMC, including the installation of 11 automatic weather stations and a new MSG receiving system, training activities and project management.

3.2.4 The meeting noted that a project to enhance the capacity of the Bahrain Directorate of Meteorology (BDM) was completed. Within this project, seven consultancy missions in agrometeorology, marine meteorology, radar meteorology, satellite meteorology and climatology were carried out. Five staff of BDM received fellowships support for their studies at the University of Bahrain. A number of staff members participated in the various short-term training courses. Specifically, all the junior staff of BDM completed basic training courses in general meteorology. An automatic weather station network composed of six stations has been established. A TV weather presentation system and a Climate Database Management System (CDMS) have been installed.

3.2.5 The meeting further noted that in the United Arab Emirates, within Phase III of a project aimed at strengthening meteorological services for the Armed Forces, an evaluation was made for a numerical weather prediction (NWP) system for short- and medium-range forecasts (up to 120 hours). A WMO consultant was assigned at the Armed Forces as Training Director.

3.2.6 The meeting was also informed that in Maldives, under a project for capacity building for the Department of Meteorology of Maldives (DMM), consultancy missions in the areas of human resources development, climate data management, marine meteorology and seismology were carried out. Equipment for meteorological observation and training was procured. Three staff members of DMM completed long-term training courses in meteorology, climatology and computer systems, and 15 staff members participated in the nine short-term training courses.

3.2.7 Under the UNDP/Global Environmental Facility project "Capacity Building for Observing Systems for Climate Change", two regional workshops were organized for Central Asia and South-Southwest Asia to develop regional action plans for the two regions. Follow-up meetings were also organized for Central Asia and South America. The second meeting of the Workshop Advisory Committee was held at the UNDP Headquarters in New York in November 2004 to review the status of implementation of the project and draw up the plan of work for 2005.

***Trust-fund projects, including bank funded projects***

3.2.8 The meeting was informed that, in Eastern and Southern Africa, the Intergovernmental Authority on Development (IGAD) Climate Prediction and Applications Centre (ICPAC: formally known as the Nairobi Drought Monitoring Centre) and the Southern African Development Community (SADC) Drought Monitoring Centre based in Harare, Zimbabwe continued to provide weather and climate information, products and early warning advisories on extreme climate events. ICPAC conducted several workshops to train regional scientists in dynamical and statistical climate modelling techniques, and organized two regional climate outlook forums to develop consensus climate outlooks for the region. In addition, the Centre's computing facilities were enhanced through the procurement and installation of additional software and hardware. These activities were carried out within the framework of two projects, funded by the US Agency for International Development (USAID), which were extended by a further two-year period to 2006. The SADC Drought Monitoring

Centre organized the eighth Regional Climate Outlook Forum for Southern Africa (SARCOF8) in Harare, Zimbabwe on 1-2 September 2004 to develop a consensus forecast for the October 2004-March 2005 rainfall season over Southern Africa. Participants included climate scientists and stakeholders from various sectors including agriculture, health, water resources and the media.

3.2.9 The meeting noted that, in West Africa, implementation of the project for Vulnerability Monitoring in the Sahel continued satisfactorily, with Italy's contribution of €2.7 million. The project aims at providing the nine Member countries of the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS) with the tools developed to evaluate the region's vulnerability as regards food security and to ensure better management of natural resources. Two projects in Chad and Mali, to strengthen operational meteorological assistance to rural communities as regards both crops and livestock, were implemented with the support of the Swiss Department of Co-operation for Development (DDC).

3.2.10 The meeting further noted that in Region III, in Brazil, the project on Technological Modernization of the National Institute of Meteorology of Brazil (INMET) continued its implementation. Technical specifications for the acquisition of an additional 40 automatic weather stations were completed. The INMET project also made progress on activities related to numerical weather prediction, computer and data archiving systems, and continued with the ISO 9001/2000 Project entitled "Numerical Forecasting System". Under the Project ANEEL/WMO, the second edition of the book "*Atlas de Energia Elétrica do Brasil*" printed and in CD-ROM in English and Portuguese was completed as well as the delivery of monthly reports. In 2004 preparatory assistance with the purpose of formulating a new project on environmental quality that would have national coverage was carried out with the assistance of WMO in collaboration with IBAMA.

3.2.11 The meeting was further informed of the activities of the International Research Centre on El Niño (CIIFEN) in Guayaquil, Ecuador on the development of innovative products with regional impact. It developed the Virtual Collaborative Environment of Research and Development (VCERD), a computational system that simultaneously allows working of groups geographically separated, remote management of research projects, and dissemination to society of the results of this research. The Climate Outlook Forum (COF) for the West Coast of South America was organized in 2004 and a Virtual Outlook has been developed using updated data from 74 meteorological stations covering the whole region. The amount of data and the scheme being used is without precedent on the history of COFs around the world. A model to determine the special behaviour and tendencies of malaria in Manabi, Ecuador has been developed. The model is intended to become an operative instrument for support planning, monitoring and selection of strategies of control to be used by the services of health, local and national authorities. CIIFEN has also developed a product based on multivariate analysis of environmental and oceanographic variables to establish a risk index for rice crops, estimated on the basis of input parameters forecasted by statistical or dynamical models. The index is a tool for decision-making process in the sector. In addition, CIIFEN has implemented several regional workshops that have resulted in networks of scientists working on particular issues. Two regional projects were being implemented with funding from the "Cooperacion Andina de Fomento" (CAF) and UNDP. Full details are available at the CIIFEN web page ([www.ciifen-int.org](http://www.ciifen-int.org)). In this light, CIIFEN is in a stage of consolidation where the support of WMO Member countries is essential to enable it to achieve its objectives, the donor Members were invited to consider possible support to CIIFEN in several ways: through provision of staff on a temporary basis, assistance in fund-raising activities and collaborative agreements.

3.2.12 The meeting noted that in Region IV, under the Water Resources Management Project (PROMMA) in Mexico funded by the World Bank, a total of 31 international and 42 national consultants carried out some 80 missions in the areas of meteorology, operational hydrology, groundwater, water quality, water resources planning and sustainable use of

groundwater. WMO provided assistance to the National Water Commission of Mexico for the preparation of the Fourth World Water Forum planned for March 2006 in Mexico City.

3.2.13 The meeting was pleased to note that the regional project "Preparedness to Climate Variability and Global Change in Small Island Developing States, Caribbean Region" (SIDS-Caribbean) funded by Finland was completed in 2004 with measurable success in the implementation of all components. The project benefited the Caribbean Meteorological Organization (CMO) countries, Cuba, Dominican Republic and Haiti. The main achievements included the upgrade of the ISCS workstations for meteorological telecommunications; and installation of 29 automatic weather stations in 12 countries as well as installation of conventional meteorological equipment in 11 countries. Three more students completed the BIP-MT training course in operational forecasting at the University of Costa Rica. Short training courses were organized on TV/media presentations, operation and use of AWS, and data rescue. A decision-makers seminar for participating countries was also organized in Barbados in May 2004. The meeting further noted that, considering the capacity built and the results achieved under the SIDS-Caribbean Project, and the interest expressed by the participating countries through the Association of Caribbean States, Finland approved US \$445,000 for the development of a pilot project on Automated Weather Service Production System for the Caribbean Area using the capacity that is now available in the region. The pilot project will be implemented in 2005 in two-three selected countries in the first phase, and extended later to the rest of the NMSs in the Caribbean region. The Finnish Meteorological Institute (FMI) and CMO are to collaborate with WMO in the implementation of the project. The pilot project is expected to contribute to the sustainability, visibility and development of the Meteorological Services and allow the establishment of partnerships offering better products and services to potential partners (public and private sectors).

3.2.14 The meeting was pleased to note that, following funds provided by Norway to the Trust Fund set up for MSG Central and Eastern Europe, three countries, Latvia, Bosnia and Herzegovina, and Serbia and Montenegro are in the process of being equipped with ground receiving equipment by Kongsberg-Spacetec Company.

#### ***Programme development activities***

3.2.15 The meeting noted that in Region I, two co-operation agreements were signed between the Economic and Monetary Community of Central Africa (CEMAC) and WMO as well as between the Government of Burkina Faso and WMO under Burkina Faso's cloud-seeding project, SAAGA. In Region III, a joint mission of WMO and the National Meteorological Institute of Spain was carried out in Bolivia to assist in the implementation of the project "Modernization of the Bolivia Meteorological and Hydrological Service", in particular the training programme and capacity building. The project has received funds from Spain and is being executed by the company Telvent of Spain.

3.2.16 In Region IV, following the floods which affected Dominican Republic and Haiti in May 2004, a WMO mission was organized in early June to identify the requirements. WMO missions were also organized to Bolivia, Dominican Republic, Guatemala, Mexico and Panama, aimed at assisting the NMHSs of these countries in the preparation and follow up of projects for development and modernization of meteorological and hydrological observing networks which will allow the NMHSs to provide information for the prevention of natural disasters as well as other types of weather and climate information for the various socio-economic sectors.

#### ***Regional collaboration***

3.2.17 The meeting was informed that the sixth Sectoral Committee meeting on Meteorology (SCOM) was held in Gaborone, Botswana from 17 to 19 March 2004. The meeting was attended by Directors of NMSs of eight SADC countries namely, Angola, Botswana, Lesotho, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe, and



representatives from ICAO and WMO. The meeting discussed various issues, which had implications on the functioning and operation of NMSs in the region.

3.2.18 The meeting noted that In Region IV, the second meeting of Directors of NMHSs of Ibero-american countries was organized in Cartagena de Indias, Colombia from 7 to 9 July 2004, by the National Meteorological Institute of Spain and co-sponsored by WMO. The main result of the meeting was the approval of an Ibero-american programme of co-operation among NMHSs of the region. WMO continued to collaborate with the various economic and technical organizations in the development and implementation of meteorology programmes and projects. These included the Association of Caribbean States (ACS) who chairs the Supervisory Board of the SIDS-Caribbean Project, CARICOM, SICA, CRRH, CMO and CEPREDENAC.

3.2.19 The meeting further noted that following the installation of measurement instruments in Indonesia and Malaysia, training courses for the use of the instruments were implemented under a project entitled "Support to the Implementation of the Regional Haze Action Plan of ASEAN Member Countries" financially supported by Australia.

#### ***Highlights of other on-going projects***

3.2.20 The meeting was also informed of the highlights of on-going projects for the replacement of current meteorological satellite ground receiving systems in NMHSs in Africa; and the radar project for CARICOM countries, as given in Annex X.

## **4. ASSESSMENT OF THE PRIORITY REQUIREMENTS FOR TECHNICAL ASSISTANCE IN SUPPORT OF WMO PROGRAMMES (*Agenda item 4*)**

### **4.1 Priority VCP requirements in support of WMO Programmes for 2005**

#### ***Generalities***

4.1.1 The meeting was informed of the priorities for assistance required to implement the WMO Programmes in the fields of co-operation covered by the VCP as given in the VCP rules: the World Weather Watch Programme, the Applications of Meteorology Programme, the World Climate Programme, the Hydrology and Water Resources Programme, the Atmospheric Research and Environment Programme, the Education and Training Programme and the Regional Programme. A summary of the information on the specific Programme needs is given in Annex XI.

#### ***World Weather Watch Programme***

4.1.2 The meeting reviewed the priorities in the implementation of the World Weather Watch Programme, which were confirmed by CBS-XIII, in particular for:

- (a) Integrated Observing Systems (IOS) (see paragraph 1.1 of Annex XI);
- (b) Information Systems and Services (ISS) (see paragraphs 1.2-1.3 of Annex XI); and
- (c) Data-processing and Forecasting Systems (DPFS) (see paragraph 1.4 of Annex XI).

#### **Transition to the Vaisala RS92 series of radiosondes**

4.1.3 The meeting noted with great concern that RS80-15G (GPS radiosonde) will not work correctly when Galileo-series satellites start transmitting, probably from December 2005. The RS92 radiosondes provide technological advancements in both data quality and transmission. However, this transition will necessitate upgrades of currently used ground stations to be compatible with RS92 sondes, or their total replacement in the case of some

older systems, such as CORA (1973), MicroCORA (1981) and PC-CORA (1990), as no upgrade options would be made available.

4.1.4 The meeting was informed that based on the WMO Radiosonde Catalogue, Vaisala RS80 radiosondes are used at about 447 (45.0%) and RS90 at about 78 (7.8%) upper-air stations out of 994 upper-air stations worldwide as at the end of December 2004. Of those stations more than 80 ground systems would need to be replaced and the rest would need different levels of upgrades. Due to the short notice given in early 2004, numerous stations would most likely not be timely upgraded or replaced due to lack of funds. It is anticipated that many VCP requests will be submitted over the next few months.

4.1.5 In view of the above, the meeting requested the WMO Secretariat to establish the facts including more detailed information from Vaisala, Oy and inform IPM members urgently of a possible contingency plan to alleviate the risk of a prolonged loss of upper-air data, especially in developing countries.

4.1.6 The meeting was concerned about the late and partial information received on this instrument problem and deprecated the assumption that VCP donors would fund the replacement.

*WMO's Action Plan for an operational GTS for the Indian Ocean Tsunami Warning System*

4.1.7 The meeting was informed of WMO's contributions to and Action Plan on Tsunami Warning Systems. WMO will ensure that GTS is expanded to accommodate tsunami-related data, advisories and warnings; priority Indian Ocean within the next six months, followed by the Atlantic region. Relevant data will be collected and transmitted via the GTS. The estimated total financial resources required to implement the WMO Action Plan is about US \$1.4 million which includes US \$900,000 for the implementation of about 14 country projects for upgrading the GTS capability of their NMHSs.

***Applications of Meteorology Programme***

**Aeronautical Meteorology Programme**

4.1.8 The meeting was informed that although currently over 160 countries in the world have installed around 200 very small aperture terminals (VSAT) to access WAFS data and products, new developments related to WAFS implementation have led to a number of VCP requests being submitted to the WMO Secretariat. These requests related mainly to the acquisition and installation of upgraded satellite terminal equipment and new workstations to access, process and display the WAFS information. Furthermore, although training on workstation operations and display of WAFS products using GRIB and BUFR code forms has been completed in all WMO Regions, assistance for additional training on the use of this equipment would still be required.

4.1.9 The meeting was further informed that new WAFS developments referred to above included the implementation of SADIS Second Generation (SADIS 2G) broadcasts and the enhancement of the US International Satellite Communications System (ISCS) broadcasts of WAFS and OPMET information over the Western Atlantic that serves the Americas as well as WAFS broadcasts over the Eastern Pacific that serves the Eastern part of Asia and the Pacific areas. The ISCS system had successfully undergone an upgrade to an IP based system, after a transition period with parallel operations of both the previous X.25 and new TCP/IP procedures. In Region IV, most countries are reported to be equipped with TCP/IP compatible PC-based workstations, and the upgrade of existing installations has been supported under international co-operation projects (SIDS from Finland and VCP from USA).

4.1.10 The meeting noted that the two World Area Forecast Centres (WAFCs), Washington and London, had plans to stop issuing all WAFS products in chart format. By the new target date of 31 December 2006, the two WAFCs will have to produce graphical

SIGWX charts required for flight documentation using the global gridded model output in the BUFR codes. It is therefore imperative for all countries relying on WAFS broadcasts to provide service to aviation to have access to the GRIB and BUFR coded information and to be able to prepare locally WAFS charts by 31 December 2006. Therefore, there may be a need for further assistance in training and the provision of workstations and visualization software.

### **Marine Meteorology and Oceanography Activities Programme**

4.1.11 The meeting noted that large parts of the world's oceans and coastal waters are seriously data deficient, for both surface meteorological and oceanographic observations. The meeting further noted that the in situ ocean observations are crucial to global programmes such as the WWW, WCP, GOOS and GCOS, as well as to individual Members. They would benefit directly from VCP support in the provision of hardware, technical assistance and training.

4.1.12 The meeting also noted that many different types of numerical models are now available to generate wave and storm surge analyses and prognoses on local, regional and global scales, and a number of countries recognize the needs of wave and/or storm surge models adapted to the local institutional and environmental conditions.

### **Public Weather Services Programme**

4.1.13 The meeting noted that VCP priorities in the PWS Programme are geared to support the need of WMO Members, particularly those in small and developing countries, for assistance to acquire, replace or upgrade computing and communications systems in order to cater for the increased universal demand for high quality public weather services, as well as to keep up with the rapid advances in technology. These priorities include the following:

- (a) TV/Media Presentation Systems comprising high performance computing and communications hardware, peripherals and software, video equipment for television production and assorted relevant accessories, as well as the requisite training of staff to use the systems for production;
- (b) Computer systems at meteorological workstations that allow forecaster interaction and enable the creation of new or enhanced products; these will include systems to access satellite imagery (inputs) and the preparation of processed products (outputs) for users;
- (c) Increased Internet access for NMSs which can be used as a fundamental communications tool to improve their data access, as well as expand the dissemination methods of their public weather services, and promote the use of official consistent information;
- (d) Fixed and mobile communication systems including modern telephone services preferably utilizing digital processes, mobile telephones, pagers/short message system (SMS) and fax-on-demand;
- (e) VHF radios to provide simple radio broadcast and warning alert systems; and
- (f) Training related to national PWS plans; this includes training in media skills (writing and presentation), product design, and public education and awareness among other things.

### **Tropical Cyclone Programme**

4.1.14 The meeting was informed that emphasis will be placed on sustainable development on: training support for the attachment of tropical cyclone forecasters from Bangladesh, Myanmar, Pakistan and Sri Lanka as trainees at the RSMC - tropical cyclones

New Delhi for two weeks in October 2005 (US \$7,000); and installation of sophisticated PC-based telecommunication equipment for Hydrometeorological Services of Cambodia and Lao PDR, with a view to helping improve their effective tropical cyclone and flood warning dissemination systems (US \$30,000).

4.1.15 The meeting recalled that the sixth biennial Southern Hemisphere Training Course on Tropical Cyclones is planned for May 2005 at the Australian Bureau of Meteorology for English-speaking meteorologists of tropical cyclone forecasters in the South-West Indian Ocean and the South-West Pacific. The main purpose of this training is to assist the trainees of tropical cyclone forecasters in their efforts to improve national tropical cyclone warning systems and services.

### ***World Climate Programme***

#### *Climate Database Management Systems (CDMS) and Data Rescue (DARE) projects*

4.1.16 The meeting noted the progress made in the implementation of the CDMS. The meeting was informed of the installation of CLIMSOFT in Botswana, Kenya, Uganda and Tuvalu.

4.1.17 More than 50 countries are currently using digital cameras to rescue and preserve their climatological records by creating digital climate archives. The US informed the meeting of the replacement of the digital cameras of the US Data Rescue project in Africa and Latin America, the old cameras having reached the end of their lifetime.

4.1.18 In this regard, the meeting recognized that the highest priority should be given to activities related to climate data rescue and digitization by providing digital imaging capability to all countries to help them preserve their data; and a high priority should be given to projects in climate data management in providing new CDMS (equipment, software and training) and also providing computer resources (equipment and software).

#### *Climate Information and Prediction Services (CLIPS)*

4.1.19 The meeting was informed that the CLIPS Project Office has initiated a programme to establish national CLIPS Focal Points and, in some cases, regional CLIPS Focal Points, and that for these focal points to be able to carry out their responsibilities effectively there was a need to undergo training on matters related to CLIPS through workshops specifically planned for that purpose. The meeting recommended that support be provided to the organization of two workshops in eastern RA II and RA IV (Central America and the Caribbean) in 2005.

4.1.20 The meeting noted the requirements for VCP donors' support for activities of Regional Climate Centres; for CLIPS experts in understanding probabilistic forecast output, and decision-making under uncertainty; and for raising awareness of young people of the benefits and challenges of climate, and the need for public and community involvement in prevention and mitigation efforts related to climate hazards.

### ***Agricultural Meteorology Programme***

4.1.21 The meeting was informed that the main priority activities in the Agricultural Meteorology Programme, which should be considered for VCP support, are: Regional Workshops in Africa on Capacity Building for Locust Control; Agrometeorological Information Service (WAMIS); and Training to NMHSs in the use of new methodologies and tools available on WAMIS.

4.1.22 The meeting noted that NMHSs need to strengthen their collaboration with the National Locust Control Centres (LCCs) and provide near real-time daily rainfall and temperature observations and forecasts at a centralized location to provide easy access for the LCCs, regional organizations and international agencies such as FAO. To accomplish

this task, WMO and FAO should jointly organize Regional Workshops on Improved Meteorological Support to National LCCs for the Francophone and Anglophone countries which would bring together staff of NMHSs and the LCCs. VCP support is being requested for the organization of these two Regional Workshops, estimated at US \$20,000 for each workshop.

4.1.23 The UK informed the meeting of a new initiative between the AGRHYMET, Met Office and the World Bank to develop locust control plans.

4.1.24 The meeting was informed that WAMIS is now fully operational and can be accessed on: [www.wamis.org](http://www.wamis.org). Funding for WAMIS for the first year was provided by the National Weather Service of the United States. VCP support is being requested for the maintenance and improvement of WAMIS for 2005, estimated at US \$10,000.

4.1.25 The meeting noted that a number of training workshops are proposed to be organized in different Regions to train staff in the NMHSs in the use of improved methodologies and tools available on WAMIS for the preparation of agrometeorological bulletins and advisories. VCP support is being requested for the organization of two training workshops in RA II and RA III in 2005. Estimated funding needed is US \$10,000 for each of the two training seminars.

### ***Hydrology and Water Resources Programme***

4.1.26 The meeting recalled that, in the Hydrology and Water Resources Programme, the main priority activities, which should be considered for VCP support, are: (a) hydrological observing systems (in particular, automatic stations, satellite transmission equipment for automatic stations, gauging equipment); (b) data acquisition and processing systems (software and hardware for database management, with particular emphasis on those countries which still maintain, partly or totally, their data bank on paper support; Geographical Information System (GIS) and Remote Sensing (RS) application to hydrology; (c) training in operational hydrology with emphasis at the technician level; and (d) expert services for the formulation of technical assistance projects and feasibility studies.

4.1.27 The meeting was informed that the hydrological data rescue pilot project in Africa was successfully implemented and contributed to: strengthening the human and institutional capacity of the National Hydrological Services (NHSs) in many African countries; strengthening the capacity of trainers in Africa; and the modernization of data archiving systems in the Region. The impact of the project in the participating countries is being assessed by the Secretariat. A larger project to cover other interested countries in Africa was developed and the project proposal was submitted to UN - Water/Africa for possible implementation as a UN joint activity. Many other requests have been received from countries in other regions. During CHy-XII, Members supported the project and requested WMO to expand the project to other regions.

4.1.28 The meeting noted that the hydrological data rescue projects for Egypt and Nigeria were supported with the VCP(F) in 2004. The project was completed successfully in the NHS in Egypt and trainers obtained certificate for training other staff in the NHSs in the Nile Basin with the new HYDATA windows version for data management. Nigeria has received the equipment and arrangements are underway for organizing a similar training.

### ***Atmospheric Research and Environment Programme***

4.1.29 The meeting recalled that Thirteenth Congress in its Resolution 10 had requested WMO Members to give all possible support to the Atmospheric Research and Environment Programme, with a high priority to the Global Atmosphere Watch (GAW) and the World Weather Research Programme (WWRP). Fourteenth Congress recognized that the GAW programme had a prominent role to play in monitoring global atmospheric composition and urged members to contribute to dedicated central Trust Funds through

which their contributions could be focused on outstanding infrastructure problems in the global GAW network.

4.1.30 The meeting noted that, within the GAW Programme, the main priority activities which should be considered for VCP support are: (a) Enhancement of the GAW network of monitoring stations; (b) Support to improvements in quality of GAW data; (c) Further development of activities in the field of atmospheric urban environment; and (d) Enhancement of GAW training opportunities.

4.1.31 The meeting also noted that, within the WWRP, priorities should be considered for VCP support for: (a) Enhancement of developing least developed countries services for their sustainable development; (b) Enhancement of WWRP training activities; and (c) Societal impact research.

### ***Education and Training Programme***

4.1.32 The meeting was informed that the Secretariat continued the promotion of cost-sharing arrangements and the use as far as possible and when available, of extra-budgetary funds for the fellowship programme. These measures should complement the traditional fellowship financial resources including the VCP fellowship funds.

4.1.33 The meeting noted that the main priority activities requiring VCP support are:

- Long-term fellowships (more than six month's duration) for basic education in meteorology and hydrology;
- Short-term fellowships (less than six month's duration) for continuing education and training (CET) in specialized fields, including the effective use of the new technologies in those fields and the training of trainers on new and advanced topics;
- Introduction of modern teaching techniques and technologies at WMO RMTCs in order to improve their Internet connectivity and to develop distance education activities; and
- Support to enhance RMTC Angola activities for RA I Portuguese-speaking countries.

### ***Regional Programme***

4.1.34 The meeting was informed that a number of high-priority needs have been identified by Members at sessions of Regional Associations. The identified priorities for each region are given in Annex XI, paragraphs 7.2 - 7.12.

## **4.2 Special items requiring urgent action under VCP**

### **4.2.1 Implementation of WAFS/RMTN systems**

#### ***ISCS and RMTN***

4.2.1.1 The meeting noted that at all sites equipped with the International Satellite Communication System (ISCS), VSAT in Region IV, including some centres in Region III (Colombia, Venezuela, Guyana, French Guiana), for the RMTN (two-way), new PC-based workstations were implemented, mainly under international co-operation projects (SIDS-Caribbean project with funding from Finland and VCP co-ordinated project supported by USA). Most NMHSs in Region III and Region V that are equipped with an ISCS VSAT receive-only station had upgraded VSAT terminals, but several sites still require assistance to carry out the required replacement of workstations. The technical and operational co-ordination of the ISCS upgrade is undertaken by the US NWS, in co-ordination with WMO.

The completion of the provision and installation of new PC-based workstations for the ISCS upgrade, for both WWW and WAFS services is of the highest priority.

4.2.1.2 The meeting also noted that as a result of the decision to use the BUFR code form for the transmission of all WAFS SIGWX forecasts and the phasing out of all current T4 Chart broadcasts planned for 1 July 2005, Members were requested to take urgent actions to upgrade their current software with the latest versions of the GRIB and BUFR visualization software to enable them to receive these broadcasts, preferably well before the target date of 1 July 2005. Consequently, it is incumbent upon each Member to find ways and means to upgrade their workstations, as necessary, and to train local staff in various Meteorological Services to enable them to access and process the binary information and display and use the WAFS products generated from the binary information. The new workstations that were installed under the above-mentioned ISCS upgrade projects include this capability. Both the London and Washington WAFCs have indicated that they are prepared to provide experts to train staff from Member countries; however funding is still needed to support participants to attend such training events.

#### *Emergency Management Weather Information Network (EMWIN) in the Pacific*

4.2.1.3 The meeting recalled that the Emergency Managers Weather Information Network (EMWIN) uses a dedicated channel of the GOES-East, GOES-West and PeaceSAT satellites for the distribution of meteorological information to support NMHSs and emergency management, including warnings. Over 30 EMWIN systems were implemented in 23 Pacific countries. The relatively low cost of the equipment, its simple installation, operation and maintenance had greatly facilitated its implementation, even in very small Pacific islands. The EMWIN implementation has dramatically improved the distribution of meteorological information and warnings of vital importance, and has demonstrated its importance during recent tropical cyclone events.

4.2.1.4 The meeting further noted that significant changes in the technical specifications of EMWIN, (reduced power level, new carrier frequency, and new binary modulation scheme) must take place and the transition, which is planned for 2007, needs the replacement of the current EMWIN receivers. The new EMWIN receivers would be downward compatible. The establishment of an EMWIN co-ordinated co-operation project would facilitate an adequate planning and support for the upgrade of all EMWIN receivers that are of vital importance for the Pacific countries, as well as for small islands in the Caribbean.

## **4.2.2 Implementation of integrated global observations for climate**

4.2.2.1 The meeting was pleased to note that the GCOS Implementation Plan supported by COP-10 (Buenos Aires, December 2004) provides a detailed framework for improving global observing systems for climate and is an important contribution to 'climate' societal area of GEOSS.

4.2.2.2 The meeting recognized the need to improve the co-operation mechanism by creating an inventory of donors (national and international) investing in climate activities and suggested that members of the IPM provide information on their contribution in the VCP as well as bilateral projects.

4.2.2.3 It was also suggested that WWW be involved in the project for transition to non-GPS radiosondes to lower the costs of radiosondes.

## **4.2.3 Response to requirements of countries affected by natural disasters and those emerging from conflict**

WMO Disaster Assistance Fund for Meteorological and Hydrological Services

4.2.3.1 The meeting noted that since its establishment, the emergency assistance under the WMO “Emergency Assistance Fund” (officially entitled “WMO Disaster Assistance Fund for Meteorological and Hydrological Services”) scheme has been provided through voluntary contributions, in cash or in kind, to 23 Member countries with support by donor Members (Australia, China, Malaysia, the Netherlands, Norway, Portugal, Republic of Korea, UK and USA) and private companies (French, Japanese and UK instrument manufacturers) as well as funding from the VCP(F).

4.2.3.2 The meeting recalled that during 2004, a number of countries were affected by natural disasters. In early 2004, Tropical Cyclone “Heta” seriously affected island States in the South-West Pacific, in particular Cook Islands, Niue, Samoa and Tonga, and Tropical Cyclone “Ivy” hit Vanuatu causing serious damage to the meteorological observation network. In September 2004, Hurricane “Ivan” affected parts of the Caribbean, in particular British Caribbean Territories of the Cayman Islands and Grenada. In addition, serious floods associated with torrential rains also affected Bangladesh, the Democratic People's Republic of Korea, Haiti and Madagascar. Emergency assistance was/is being provided under the Emergency Assistance Fund scheme and the VCP to the NMHSs in Democratic People's Republic of Korea and some island States in the South-West Pacific to meet the urgent requirements for the restoration of basic facilities affected by natural disasters in line with the established procedures.

4.2.3.3 The meeting expressed its concern about the slow process of implementation of assistance under the Emergency Assistance Fund scheme. It considered that the emergency assistance should be intended for only very short-term requirements. A back-up system in case of disasters should be developed or strengthened in individual countries. In view of the need for the involvement of meteorological experts in the assessment and resource mobilization teams, the meeting considered that contribution of Regional and Subregional Offices in emergency assistance activities should be enhanced. Experience should be shared across the regions.

4.2.3.4 The meeting was pleased to note that further to the fact-finding mission to Haiti in June 2004, the second WMO expert mission was carried out from 25 January to 2 February 2005 in collaboration with UNDP and with the assistance and participation of WMO partners, Météo-France and the Inter-American Development Bank (IDB). The expert team, composed of experts in hydrology, meteorology and institutional issues, collected information through meetings with governmental institutions, international organizations and international funding agencies to prepare a project proposal for development of meteorological and hydrological services in Haiti for the prevention and mitigation of natural disasters. Early warning systems will be developed and implemented at two basins (Fond Verretes and Camp Perrai) with funding from UNDP in an immediate phase and those for other 13 priority basins of Haiti will be financed by IDB. IDB is also expected to provide the funds for the flood forecasting system and the development of meteorological and hydrological services in Haiti.

Response to Tsunami

4.2.3.5 The meeting also recalled that following the huge earthquake which occurred on 26 December 2004 off Sumatra, Indonesia, several countries in South Asia and East Africa were seriously affected by subsequent tsunamis, including Indonesia, India, Maldives, Malaysia, Myanmar, Seychelles, Somalia, Sri Lanka, Thailand and United Republic of Tanzania. The meeting noted that WMO, in consultation with the National Meteorological and Hydrological Services (NMHSs) concerned, is assessing the damage to the infrastructure of NMHSs affected. Requests for assistance have been received from Maldives and Seychelles, and it was informed that one station in Sri Lanka is in need of restoration. In this connection, donor Members were invited to consider possible support for



the restoration of meteorological and hydrological services in the above countries after consolidation of the priority meteorological and hydrological equipment and instruments.

4.2.3.6 The meeting was informed that WMO looks forward to collaborating with potential donors and affected countries in rehabilitating NMHSs, developing multi-hazard early warning capabilities, technology transfer and capacity building and raising public awareness for NMHSs. For WMO disaster prevention activities, WMO will be setting up a new Trust Fund "WMO multi-hazard disaster prevention fund" in due course.

*Response to requirements of countries emerging from conflict*

4.2.3.7 The meeting noted that the VCP Programme has played an important role in supporting countries emerging from conflict, including Guinea Bissau and Sierra Leone. In this regard, EC-LVI expressed its appreciation to Members for their contributions in cash and in kind for technical assistance activities and noted the on-going assistance through the Emergency Assistance Response Team (EART) activities to countries emerging from conflict, such as Afghanistan, Liberia and Sierra Leone.

4.2.3.8 The meeting was pleased to be informed that assistance is being provided to Afghanistan. The urgent requirements for the Afghan Meteorological Authority (AMA) were reassessed with the PR of Afghanistan in May 2003. Assistance for the Internet connection; provision of CDMS equipment and training in SADIS and CDMS were identified as the highest priority. The equipment for the Internet connection and CDMS is being provided in 2004-2005 with the support of UK and the funds allocated for emergency assistance activities. China, Germany, Islamic Republic of Iran and UK provided meteorological instruments for surface observing stations, and Islamic Republic of Iran carried out a refresher training course for observers/technicians.

4.2.3.9 A WMO expert mission to Kabul was carried out from 5 to 13 February 2005, to assess the most urgent needs and requirements of AMA and to assist AMA in the identification of medium- and long-term requirements and in the formulation of project proposals. The mission team, composed of the experts from the Islamic Republic of Iran Meteorological Organization, the UK Met Office and WMO, identified urgent requirements for, among others, (1) new synoptic stations using existing equipment; (2) forecaster display and production system in the Headquarters with access to the Internet, SADIS and satellite imagery; (3) direct satellite imagery reception; and (4) relevant training activities. A draft Master Plan for the rehabilitation of AMA is being prepared by the mission team.

4.2.3.10 A representative of UK, who participated in the above mission as an expert, informed the meeting of the current situation of AMA and Afghanistan. Twenty-five years ago AMA were well equipped, but have since lost almost everything. Access and security for sites is likely to remain a problem for some time. The AMA has probably missed the main opportunities for gaining a major project at present, but there are many projects which have a linkage. Projects directly linked are with AFRANE (French aid funded) which has set up 15 observing stations and HQ facilities; FAO agromet data project and IRIMO-mediated project covering equipment for ten synoptic stations and observer training. There is a parallel World Bank project in the Ministry of Irrigation, and also an Asian Development Bank project for civil aviation which is in the planning stage. The major issue for AMA is to position themselves institutionally, and deliver services into all these projects. A useful contact was made with ISAF, who are keen to start handing over aviation observing and forecasting. JICA were sympathetic to considering projects.

4.2.3.11 The meeting further noted that WMO is also playing a lead role in co-ordinating efforts aimed at the rehabilitation of the Meteorological Service of Iraq. A WMO EART for the Reconstruction of IMO (EART-IMO) was established to develop and finalize a Master Plan for the reconstruction of IMO and to assist in the mobilization of the necessary resources for the implementation of the Master Plan. The first meeting of the Steering Committee of EART-IMO was held on 23 April 2004, with 13 participants from Member countries including

PR of Iraq, and 10 staff members from the WMO Secretariat, to review the steps taken so far, to plan for the mission(s) to assess the status of infrastructure, facilities and human resources and to initiate the development of a Master Plan for the reconstruction of IMO. As agreed by the Steering Committee, a project was implemented for the installation of the Horace Linux Forecasters' workstation; and a forecaster refresher training course was provided to five IMO forecasters from 18 October to 19 November 2004 in Exeter, UK.

4.2.3.12 A WMO Trust Fund for the Reconstruction of IMO was established on 9 March 2004, and UK and China contributed £100,000 and US \$10,000, respectively, to the Trust Fund. The USA will make an in-kind contribution of US \$20,000 to IMO under the VCP. Italy is collaborating in the fields of water and environment with IMO and the Ministry of Environment of Iraq through the Ministry of Environment of Italy. Italy is expected to provide support to the Iraqi Government for airport meteorological equipment, 50 AWSs, etc. and training and expert services. The Netherlands will make an in-kind contribution by detaching an expert to participate in EART-IMO activities. The meeting welcomed the planned contributions indicated during the meeting by Australia and Japan.

4.2.3.13 The meeting was pleased to note some on-going and completed activities for assistance to IMO. Jordan provided an intensive training course to 10 observers from IMO from 13 June to 1 July 2004. The trainees from IMO received theoretical and practical training on various methods of meteorological observations. The trainees were also introduced to the recent developments and procedures in meteorological practices, in particular telecommunication, satellite and aviation meteorology. The Islamic Republic of Iran is ready to accept the staff members of IMO for the training of at least 20 observers/technicians and 10 forecasters/technical experts. The Islamic Republic of Iran is expected to provide IMO with the meteorological equipment, and send their technical experts in various fields to IMO. Germany is providing conventional meteorological instruments to equip 60 synoptic stations.

#### **4.2.4 Requirements of NMHSs in LDCs**

##### *WMO Programme for the Least Developed Countries (LDCs)*

4.2.4.1 The meeting noted that since the establishment of the WMO Programme for the Least Developed Countries (LDCs) in May 2003, a number of actions have been initiated to implement the programme as follows:

(a) A WMO Trust Fund on the LDCs was established in 2003 to receive contributions from Members, bilateral and multilateral funding agencies. An amount of US \$20,000 from the VCP(F) was used to launch the Fund. Furthermore, several countries (Australia, China, Colombia, Egypt, Pakistan and Turkey) have offered cash and in-kind contributions to the Fund.

(b) For the period 2004-2005, a selected number of LDCs have been targeted for special attention under the programme. These include Angola, Central African Republic, Guinea, Guinea Bissau, Liberia, Madagascar, Malawi, Sao Tome and Principe, Sierra Leone and Zambia in RA I; Bhutan, Cambodia, and Myanmar in RA II; and Haiti in RA IV.

4.2.4.2 Regarding the targeted countries, it was also noted that WMO missions were carried out to several LDCs in Africa (Angola, Liberia, Madagascar, Sierra Leone, Malawi and Zambia) to assess the status of the National Meteorological Services (NMSs) and to prepare appropriate project proposals for rehabilitating and enhancing their infrastructure and human resource capacity. These missions were funded through the WMO's VCP Programme. Further to the above efforts, a workshop was organized in 2004 to enhance the capabilities of Directors of NMSs in Africa in strategic planning and resource mobilization.

4.2.4.3 In RA II, WMO missions visited Bhutan (July 2004), Cambodia (March 2003 and August 2004) and Afghanistan (February 2005) to assess the status of the NMHSs and to discuss with government authorities concerned on the strengthening of NMSs in these countries.

4.2.4.4 In Haiti, an expert team (hydrology, meteorology and institutional) visited the country from 25 January to 2 February 2005 to obtain information for preparing a project proposal for the development of meteorological and hydrological services in Haiti for the prevention and mitigation of natural disasters. Future actions would be carried out in three distinct phases. For the first phase, with funding from UNDP, WMO will provide technical expertise for installing and putting in operation the corresponding systems. The second phase will involve the installation of early warning systems for the 13 priority basins in Haiti to be financed by the Inter-American Development Bank. The final phase will develop plans for the Meteorological and Hydrological Services to be implemented in several phases over a period of three to five years.

4.2.4.5 It was noted that there are great expectations on the part of most of the LDCs of receiving assistance under the programme. There is, therefore, a need for instituting appropriate measures to speed up implementation of the programme.

#### VCP requirements of NMHSs in LDCs

4.2.4.6 The meeting considered the outstanding VCP projects for LDCs given below:

RA I: Angola, Benin, Burundi, Comoros, Eritrea, Ethiopia, Gambia, Guinea, Guinea Bissau, Madagascar, Malawi, Mali, Mauritania, Niger, Sao Tome and Principe, Sierra Leone, Sudan, Uganda, United Republic of Tanzania;

RA II: Bangladesh, Cambodia, Maldives, Myanmar, Republic of Yemen;

RA V: Kiribati, Samoa, Solomon Islands, Vanuatu.

### **4.2.5 Education and training fellowships activities**

4.2.5.1 The Meeting noted that the Education and Training Fellowships Programme continued to make essential contributions to enhancing capabilities of NMHSs and that the emphasis is placed on using, as a first priority, the training facilities within the Regions concerned, in particular those of the Regional Meteorological Training Centres (RMTCs).

#### VCP priority areas

4.2.5.2 The Meeting agreed that the main priority areas for VCP support to education and training are long-term fellowships for basic education in meteorology and hydrology; short-term fellowships for training in specialized fields; continuing education and training (CET) and group training to meet the emerging new needs of Members for education and training in fields such as information and communication technologies and the economic aspects of Meteorological Services, satellite meteorology, new telecommunication systems, computer technology and modern data processing systems, climate change and the atmospheric environment, in particular for personnel from developing countries. The meeting also recognized the need for support to RMTCs for the improvement of training facilities and the performance of instructors.

#### Implementation of fellowships during 2004

4.2.5.3 The Meeting was informed that during 2004, a total of 804.7 person x month of fellowships was awarded. Out of this, 691.6 person x month of fellowships were granted for long-term studies and 113.1 person x month for short-term training and study tours on the

management of Meteorological Services. The funding sources under which these fellowships were granted included cost-sharing arrangement between Regular Budget (RB) and VCP (40.7% of cases), RB (22.36%), UNDP (14.56%), Trust Funds (12.85%) and VCP (9.53%). The RB/VCP cost-sharing arrangement takes into account the use of RB funds to complement the stipend, insurance and book allowance, and in some cases the air-ticket of those fellows studying mainly in the Russian Federation and to a limited extent, India and Philippines.

4.2.5.4 The Meeting noted with satisfaction that the VCP(F) annual allocations for short-term fellowships and group training activities have continued to satisfy some of the urgent and pressing training needs of developing Member countries. It noted further that there are still many more pressing needs to be met particularly from countries affected by civil strife such as Afghanistan, Iraq, Liberia and Sierra Leone. In this regard, VCP donor Members were invited to consider maintaining, and, if possible, further increasing their contributions to the fellowships programme.

*New measures to improve the fellowships programme*

4.2.5.5 The Meeting expressed satisfaction with the new initiatives and appropriate measures being taken by the Secretary-General to ensure the highest possible level of effectiveness and fairness of the WMO Education and Training Fellowships Programme. Measures are aimed at increasing the efficiency and transparency of the fellowships programme and assisting Members in their requests for WMO fellowships and study tours and include the introduction of new procedures for the award and monitoring of fellowships.

4.2.5.6 The Meeting recognized the importance of strategic planning in the selection of fellows and implementation of fellowships as well as monitoring and evaluation of the fellowship activities. It agreed that these should be carried out in collaboration with the relevant training institutions and the Permanent Representatives of benefiting Members. Post-fellowship evaluation to assess the impact of the fellowship on the NMHSs for up to two years after the training was emphasized. The Meeting also agreed on the need to improve information exchange between the Secretariat and donors regarding fellowship activities.

## **5. MAJOR TRENDS, DEVELOPMENTS AND OPPORTUNITIES**

5.1 The Meeting considered information on major trends and opportunities as part of a strategic framework to guide the planning, implementation and evaluation of pertinent VCP activities, particularly with respect to the provision of needed resources for their realization.

5.2 The meeting recognized that WMO and the NMHSs are being called upon to be more proactive, responsive and relevant. The effectiveness of WMO and NMHSs in making concerted responses to societal issues deserved a closer look, in the light of recent challenges. The strategy and resource allocation for pertinent activities should take into account the following areas of concern, among others:

- (a) Changes in policy actions at country level due to prevailing socio-economic developments which are peculiar to various sovereign nations and states;
- (b) Need for strengthening capacity of NMHSs as part of national recurrent and development infrastructure and service delivery;
- (c) Positioning of various NMHSs to be more relevant players amongst those that deal with multilateral environment and development issues, particularly those related to poverty alleviation and other socio-economic concerns;

- (d) Resource mobilization in support of human resource development and modernization of hydrometeorological infrastructure;
- (e) Need to strengthen the scientific base of various services as front-liners in the development of geosciences.

5.3 The meeting considered developments relating to the following relevant recent initiatives:

- (a) (Future) WMO Information System (FWIS);
- (b) Quality Management Framework (QMF);
- (c) Space Programme;
- (d) Group on Earth Observations (GEO) and the Global Earth Observation System of Systems (GEOSS);
- (e) Natural Disaster Prevention and Mitigation Programme;
- (f) World Conference on Disaster Reduction (WCDR);
- (g) International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States.

5.4 The meeting recognized that the implementation of FWIS would build upon the most successful components of existing WMO information systems. It further considered that significant additional work was required from the individual WMO Programmes, as well as through a common effort, to consolidate a comprehensive and consistent status of data exchange and data management requirements, as well as a mapping of information functions of WMO Programme centres to the functional components of FWIS.

5.5 The meeting recalled that Congress decided (Resolution 27 (Cg-XIV)) that WMO should work towards a Quality Management Framework (QMF) for NMSs that would eventually include and develop the following distinct, though related, elements, which could be addressed, possibly on a phased basis:

- (a) WMO technical standards;
- (b) Quality management system(s) including quality control; and
- (c) Certification procedure(s).

5.6 The meeting was informed that guidance material in the form of the first WMO Technical Report on QMF (on CD-ROM) had already been published, which contained, *inter alia*, basic QM documentation offered by several Members, several technical reports and the final report of the WMO Workshop on Quality Management held in Kuala Lumpur, Malaysia in November 2004.

5.7 It concurred that the development and implementation of QMS is a particular challenge for NMSs, especially in developing countries, but this would be primarily a national responsibility. It is envisaged that those NMSs which had successfully implemented a QMS, or completed a QMS certification according to ISO 9001, would share their experiences with others by making available relevant documents for information and guidance. It is particularly important that the WMO QMF should provide clear and unambiguous guidance on QMS and show that the WMO QMF is complementary and not exclusive to QMS according to ISO 9001. The WMO QMF should also identify options for pursuing ISO 9001 QMS and certifications at reasonable cost, and it should address quality control aspects related to forecasting and warning products and services in order to achieve quality improvement in the outputs of the NMSs.

5.8 The meeting was informed of activities for the new, crosscutting WMO Space Programme during 2004 towards meeting the goals of the Implementation Plan. It was particularly interested in activities within the WMO Space Programme in support of the WMO Strategy for Education and Training in Satellite Meteorology. The next training event to be held in Costa Rica in March 2005 would test the development and use of an electronic notebook (laptop computer) for the students to use during the workshop and in their country for training more people on what was learnt during the workshop. By providing a pre-configured notebook with all the lectures, data and applications to the participants, it should make the training event and follow-on training much more streamlined and effective. In many ways this is just a continuing evolution from providing course participants with written material (pre-1990s) to floppy discs (pre-1995) to CDs and DVDs but would imply additional cost (approximately US \$2,000 per person).

5.9 Concerning the GEO, the meeting took note of developments that marked substantial progress including the Ministerial Level Third Earth Observation Summit recently concluded in Brussels. The Summit created a formalized Group on Earth Observations with 60 Member States and 40 participating organizations from the original intergovernmental ad hoc GEO. The co-location of the GEO Secretariat with the WMO Secretariat, the establishment of the GEO Trust Fund, a staffing plan for the GEO Secretariat and the identification of the 2006 Workplan Drafting Team are in progress. The meeting underscored one of the stated aims of GEO, as noted in the Washington Declaration of 31 July 2003, to build capacity, particularly in developing countries, to capture, and process Earth observation data and to exploit the resultant information and products emanating from the GEOSS to achieve socio-economic benefits across a variety of themes including weather, climate and water. It was determined that GEO presents enormous opportunities for capacity building in support of NMHSs enhancement. The first meeting of GEO will take place at WMO Headquarters in Geneva, 3-4 May 2005.

5.10 The meeting was informed that the Natural Disaster Prevention and Mitigation Programme is developing a user-driven and co-ordinated framework, with the following goals:

- (a) To promote greater emphasis on proactive strategies for prevention and preparedness;(b) To ensure that WMO core technical and scientific capabilities, particularly early warning systems, are integrated optimally in all relevant phases of disaster risk management at the international, regional and national levels;
- (c) To promote and enhance the role of NMHSs as critical components of the national disaster risk reduction platforms, particularly within developing countries;
- (d) Raise awareness to the benefits from investments in natural disaster prevention, particularly in early warning systems; and
- (e) To work together with international, regional and national partners and the private sector.

5.11 The programme's activities emphasize on pre-disaster preparedness and are based on the activities within a number of WMO programmes, including the Public Weather Services and other components of the Applications of Meteorology Programme. The programme serves as a vehicle for enabling the delivery of increasingly accurate and reliable warnings of severe events, especially through co-ordinating WMO actions towards improving mechanisms and communication for the delivery, use and evaluation of warnings, provision of prompt advice and assistance to Members; and enhancing effective international co-operation and collaboration. Its implementation is being coordinated with other interested international organizations and programmes, in particular with ISDR.

5.12 The meeting noted that there is a range of hazards, both natural and human induced, that can cause disastrous impacts on communities, with meteorological and hydrological disasters constituting a large majority (about 90%).

5.13 An important element in ensuring a better appreciation of the role and contribution of NMHSs in natural disaster risk reduction and other areas, is by conducting multi-sector studies on the economic value and benefits of meteorological and hydrological services. The meeting agreed on the need for support for pilot studies in this area in the developing countries, particularly for the Least Developed Countries (LDCs), and the Small Island Developing States (SIDS). This would also be part of the preparation for the International Conference on Economic and Social Benefits of Meteorological and Hydrological Services, planned for 2007.

5.14 The World Conference on Disaster Reduction (WCDR), Kobe, Hyogo, Japan, 18 to 22 January 2005, provided an excellent platform to present WMO's Natural Disaster Prevention and Mitigation Programme, and to promote and enhance the visibility of WMO and the NMHSs. WMO's overall considerations and key messages were reflected in the outcome of the Conference particularly related to the importance of risk assessment and early warnings for weather-, climate- and water-related hazards. (An annotated copy of the Hyogo Declaration and Hyogo Framework of Action 2005-2015 was provided to the meeting.)

5.15 WMO participated in the expert panels at two Thematic Tsunami Sessions in WCDR, discussing WMO's relevant contributions to the tsunami early warning initiative, and stressed the critical need for strong partnerships, multi-hazard approach and building on the current capabilities including the GTS. A WMO project on this topic has been developed.

5.16 The meeting recognized that as an outcome of WCDR, there are significant opportunities for WMO to take the lead role in enhancing risk assessment and early warning system for multiple hazards related to weather-, climate- and water-related hazards, including benefits from developing its multi-hazard strategy for disaster reduction.

5.17 The International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States approved the Mauritius Declaration and the Mauritius Strategy for the further implementation of the Programme of Action for the Sustainable Development of Small Island Developing States.

5.18 The Mauritius Declaration reaffirmed the Barbados Programme of Action as the blue print for the implementation of the Mauritius Strategy. The Meeting through the Declaration expected a growth in the vulnerability of SIDS, reaffirmed its commitment to support SIDS, and called for the establishment of a natural disaster early warning system. The Declaration called for enhanced international cooperation and partnership, technology development and transfer and capacity building, and expressed appreciation to the UN and its specialized agencies for their contributions in support of SIDS.

5.19 The Mauritius Strategy addresses issues related to climate change and sea-level rise, natural and environmental disasters, management of wastes, coastal and marine resources, freshwater resources, land resources, energy resources, tourism resources, biodiversity resources, transport and communication, science and technology, graduation from least developed country status, trade: globalization and trade liberalization, sustainable capacity development and education for sustainable development, sustainable production and consumption, national and regional enabling environments, health, knowledge management and information for decision-making, and culture.

5.20 It is planned to develop a WMO Action Plan aimed at assisting NMHSs of SIDS in the implementation of the Strategy. This will include the development of relevant partnerships with the United Nations system organizations, with relevant regional and international organizations and development partners in areas of concern to the NMHSs. The Plan will take into account WMO's Programmes and activities including that for LDCs, the crosscutting strategies being developed in relation to disaster mitigation, climate, water, the Global Earth Observation System of Systems as well as other relevant regional and global initiatives such as the Millennium Development Goals and the World Summit on

Sustainable Development. Members will be invited to assist in the development and implementation of the Action Plan so that tangible results would be achieved in support of the sustainable development objectives of SIDS.

5.21 The meeting agreed that the pressing need to support NMHSs and their activities nowadays also engender the need for a more strategic approach, increased partnership and enhanced resources. Given the challenges posed by various recurrent and development issues at national level, it was therefore essential that facilities and capacities of NMHSs are strengthened so that they could play a crucial role as part of a consortium of development partners at national, regional and global levels.

5.22 In this regard, the meeting also noted that one of the areas in which changes have been introduced at the WMO Secretariat is via the enhancement of the use of matrix approach, particularly for crosscutting issues. A number of Secretariat Steering Committees, including on resource mobilization has been established. Improved delivery of activities is also expected through a restructured Regional and Technical Cooperation Activities for Development Department. With further emphasis on development in the Department, therefore, it is expected that the new technical cooperation activities, including VCP, will also be further targeted at development issues, in addition to enhancing various competencies of, and co-operation between NMHSs in developed and developing countries alike.

## **6. OUTLOOK OF VCP AND OTHER RELATED TECHNICAL CO-OPERATION PROGRAMMES FOR 2005**

### **6.1 VCP activities for 2005 with emphasis on the 2005 VCP theme, "Technical Co-operation for sustainable development".**

#### ***Expected Members' support to the VCP in 2005***

6.1.1 The lists of VCP project requests which have not yet received full support were presented to the meeting to invite donors' consideration of support. It noted that there are 248 VCP projects for equipment and services which still require support from donor Members.

6.1.2 The information on VCP donor Members' expected contributions to the VCP in 2005 is given in section 6.2 below. The meeting noted that the total contribution in 2005 is expected to be at the same level as in 2004.

#### ***Effectiveness of the Voluntary Co-operation Programme***

##### **Management of the VCP Programme**

6.1.3 The meeting noted that, following the approval of Cg-XIV, the VCP Programme in 2005 will continue to be implemented and managed in accordance with the approved Programme and Budget for the fourteenth financial period and established Procedures and Rules of the VCP (with amendments agreed by EC-LVI).

6.1.4 Promotion of the VCP Programme will continue to be made through: (1) issuing regularly VCP-related publications to Members in print and through the Internet: VCP News (monthly); "Consolidated Report on the Voluntary Co-operation Programme including Projects approved for Circulation in 2004" (January 2005); and "VCP Consolidated List of Projects and Status of Implementation 2005", and its "Supplements"; (2) the further enhancement of Internet TCO and VCP web pages; (3) the VCP manager's missions to potential donor countries for expanding donor base; and (4) increased participation of Regional and Subregional Offices in the implementation of VCP projects, including project formulation, monitoring and evaluation processes.



6.1.5 A further enhancement of the related web pages with regular updates, in particular for TCO web pages, is planned to be made in 2005. VCP web pages will include "List of outstanding VCP projects" (with regular updates).

#### Restructuring of RCD Department

6.1.6 The meeting was informed that, in order to improve the delivery of services to Members and to enhance partnerships with national, regional and international institutions and organizations, a new Department of the Regional and Technical Co-operation Activities for Development (RCD) was created in January 2004. The new structure and mode of operation for the RCD Department were defined in December 2004, taking into account the experiences gained in the harmonization process of the functions of Regional and Subregional Offices with those of the Technical Co-operation Department. The organigramme of the RCD Department is given in Annex XII. In order to enhance the delivery of regional and technical co-operation activities and to discharge efficiently the functions assigned, the Department will operate through core Offices/Units based at Headquarters and Field Offices located in the respective regions. These Offices/Units should collaborate closely in areas of mutual interest. The meeting noted that the new organization of the RCD Department is being implemented by stages.

6.1.7 The respective RCD Field Offices are responsible for the implementation of both regional and technical co-operation activities in the regions. This includes, among others, the support to Regional Associations, the development and implementation of technical assistance projects and programmes in support of NMHSs, the liaison with regional and subregional institutions and organizations and resource mobilization in the region, in accordance with the new functions of the Department. Considering various implications and to allow for the necessary preparations for the out-posting of Field Offices, the implementation of the new organization of the Department is being processed by stages.

6.1.8 The Regional Activities Co-ordination (RAC) Unit provides full backup and liaison services between the Field Offices and the relevant Departments and Offices at Headquarters, and should ensure coherence and co-ordination in the implementation of the Regional Programme including assistance in the preparations for sessions of Regional Associations. It provides support for the co-ordination of common regional issues. The Unit is responsible for the implementation of the WMO Programme for the LDCs and support for SIDS in close collaboration with VGP Office, Field Offices and scientific and technical Departments.

6.1.9 The meeting noted that the Voluntary Co-operation Programme, Global Programmes and Strategic Partnerships (VGP) Office is responsible for the management and implementation of the WMO VCP Programme, in close collaboration with the Field Offices. In addition, it provides support to the implementation of a certain number of technical co-operation activities including the support to the EC Advisory Group of Experts on Technical Co-operation, contributions and documentation to various WMO meetings and workshops, the management of the statistical database, and the preparation of inputs to the WMO regular publications and web pages. The Office is also responsible for the response to disasters and relevant assistance to NMHSs of affected Members.

6.1.10 In this regard, the meeting recognized that increased participation is expected of Regional and Subregional Offices in the implementation of VCP projects including the identification of requirements, assistance to PRs in the preparation of VCP requests and VCP project formulation, and monitoring and evaluation of VCP projects.

6.1.11 The other functions of the Office relate to the implementation of cross-cutting technical co-operation activities, especially inter-regional and global projects and programmes, the co-ordination and implementation of resource mobilization activities within the Secretariat and in support of the Field Offices, and the development of stronger and effective strategic partnerships with relevant institutions and organizations, including those of

the UN system and bilateral and multilateral funding agencies. The Office is also responsible for liaising with the Procurement and Travel Office on matters related to the procurement of equipment and services for global and regional projects, technical co-operation-related activities for the Department, Offices/Units at Headquarters and Field Offices.

6.1.12 The meeting recalled that procurement of equipment and services was a crucial component in the implementation of VCP projects and related technical co-operation activities. It noted that there were changes in the processing of procurement in the WMO Secretariat in light of the need for enhanced internal control to meet audit requirements.

6.1.13 In view of the formation of the RCD Department, the changes in procurement, and the changes in VCP Fellowships and Training noted in paragraphs 4.2.5.5 and 4.2.5.6, IPM requested the Secretariat to provide documentation of the processes involved in the development, implementation (including procurement) and evaluation of VCP projects in both Equipment and Services and Fellowships and Training areas. IPM suggested that these documents should be in a process-oriented form amenable to a Quality Management System approach. In developing these Process Documents, the Chairman was requested to be involved, and to keep members of the IPM informed. It requested its IPM members to provide their comments and suggestions to the Chairman of the IPM and for the latter to communicate these comments to the WMO Secretariat.

#### VCP Requests and Evaluation

6.1.14 Since January 2005, VCP projects have been formulated by the VGP Office in accordance with the revised VCP project request format, as agreed by the 2004 IPM and EC-TC-V. A WMO circular letter informing of the revision of VCP request and evaluation forms has been sent out to Members in February-March 2005, to facilitate PRs' preparation of VCP requests using the new request form. The sixth evaluation of VCP projects completed in the last five years will be carried out in July-October 2005 using the revised evaluation form.

6.1.15 The VCP monitoring process will be strengthened, in collaboration with RCD Field Offices, through the continued utilization of a simpler completion report containing information on the completion, expected results, degree of satisfaction to the arrangements (for delivery and training), etc. for supported projects.

#### ***VCP co-ordinated programmes***

6.1.16 The meeting noted that various technical projects including training have satisfactorily been implemented under the currently approved VCP co-ordinated programmes by EC-LVI, as given below, and the priority areas are still valid, the meeting felt that it would be appropriate to maintain the list of VCP co-ordinated programmes during 2005-2006:

- Improvement of the global network of observing stations with special emphasis on the GCOS upper-air network and HYCOS stations
- Improvement of the telecommunication systems, including common carrier technologies and the use of Internet technology, specifically for transmission of satellite data
- Improvement of the performance of NMCs
- Support to the Tropical Cyclone Programme (TCP)
- Support to public weather services (PWS) activities
- Support to climate data management and CLIPS

- Support to training and human resources development for meteorology and operational hydrology
- Support to ACMAD activities

#### ***Allocation of the Voluntary Co-operation Fund (VCP(F)) for 2005***

6.1.17 The meeting reviewed the proposal for the allocation and adjustment of VCP(F) for 2005. New allocations and adjustments are proposed based on the projected contribution to the VCP(F) in 2005 (estimated to be about US \$220,000), taking into account the expenditures over the past years and priorities in support (in view of the VCP theme for 2005 "Technical Co-operation for Sustainable Development"), mainly for short-term fellowships; expert services, improvement of observing system of GOS and GCOS; TCDC activities; CDMS and climatological activities; Internet capabilities; and hydrological activities.

#### ***WWW Implementation Support Revolving Fund***

6.1.18 The meeting considered the issue of long-term unpaid loans which were provided under this Fund. As discussed in the 2004 IPM and EC-TC-V and agreed by EC-LVI that the Members who were not able to pay the outstanding reimbursements due to special circumstances such as civil strife, Guinea Bissau, as a LDC emerging from conflict, has submitted a normal VCP request for the provision of five anemographs and recording charts. In this regard, the meeting welcomed Australia's willingness to consider supporting this VCP project request for Guinea Bissau to reimburse the outstanding amount of US \$10,091 since 1989.

#### ***Funding of projects - resource mobilization for the VCP Programme***

6.1.19 The meeting recalled that EC-XLVI (Geneva, June 1994) felt that the assistance of the donor Members to the resource mobilization efforts of WMO could be of great benefit, and agreed to invite the donor Members to focus their VCP resource mobilization activities on the assistance to VCP co-ordinated programmes. Cg-XIV welcomed the publication of the VCP Brochure entitled "Working together - Partnerships in weather, climate and water for development" aimed at highlighting the success of the Programme and the advantages of participating in the VCP Programme. In this regard, Congress encouraged Members to carry out resource mobilization activities in their countries with the on-line information and materials available.

6.1.20 The meeting was informed that the Secretariat Steering Committee on Resource Mobilization was established in 2004 to develop and implement WMO's overall policy and strategy for resource mobilization, and to co-ordinate the Secretariat resource mobilization activities. Its first meeting held in November 2004 discussed and considered the terms of reference of the Committee and its work plan. The Committee noted some of the best practices and examples from the past and on-going resource mobilization activities and recognized the need to identify focal points in Member countries and funding organizations; to identify and take into account the priority areas of donor agencies; to develop joint projects with other organizations and financial institutions on areas of mutual interest with specific targets; and to increase WMO visibility and national visibility of NMHSs for resource mobilization.

6.1.21 Two Task Teams at working level, *i.e.*, Task Team to define the WMO policy and related strategy on resource mobilization (TTRM-PS); and that for operations (TTRM-OP), have initiated their duties. TTRM-PS will design and develop an implementation plan for the WMO policy and strategy on resource mobilization, and TTRM-OP will co-ordinate the Secretariat resource mobilization activities and develop and implement a plan to improve existing resource mobilization activities making use of best practices including the development of project proposals at departmental or interdepartmental level. Resource mobilization activities for the VCP will be carried out in line with the work plan of the Committee, and with increased participation of RCD Field Offices.

6.1.22 The meeting noted that mission(s) by T. Toya, VGP Office, will continue to be carried out for the promotion of and resource mobilization for the Programme. Missions to developing countries carrying out TCDC activities and regional development banks are also planned in 2005.

***Co-operation with other funding/technical co-operation organizations***

6.1.23 As agreed at the 2004 IPM, representatives of several partner organizations (funding institutions, technical co-operation organizations and the private sector) based in Japan and Asia were invited to the meeting in order to foster close co-operation with these agencies and exchange information on relevant activities. In this context, a special session was dedicated to presentations of activities of: the Japan International Co-operation Agency (JICA), the Asian Disaster Reduction Centre (ADRC), and the instrument manufacturing company (EKO Instruments Co. Ltd).

6.1.24 The meeting was given a brief introduction by Mr I. Adachi, Group Director, Water Resources and Disaster Management, JICA, of JICA's mission, co-operation policy, main programmes, procedures and an overview of technical co-operation projects including training in the fields of meteorology and hydrology.

6.1.25 Dr T. Hatori, ADRC made a presentation of the main activities of ADRC focussing on recent disaster reduction activities related to climate/hydrological disaster in the Asian region. Dr Hatori explained "town-watching for disaster reduction" as a practical tool for efficiently implementing "community-based hazard mapping" in Japan, Viet Nam, Indonesia, etc.

6.1.26 The major advantages of town-watching are that people are better able to: (1) develop a concrete image of disaster reduction activities among all stakeholders including government officials, experts, local residents, etc.; (2) autonomously identify problems in their own communities; and (3) share opinions and reach a reasonable social consensus through face-to-face discussions. He repeatedly emphasized the importance of the participatory education and training on how to use hazard maps through the town-watching approach. The meeting felt that the concept of town-watching for floods and earthquakes is very useful and should be applied to other areas.

6.1.27 The meeting was informed by Mr T. Hasegawa of the activities of the Association of Hydro-Meteorological Equipment Industry (HMEI), Japanese Association Meteorological Instruments Engineering (JAMIE), and EKO's involvement in VCP. The establishment of HMEI was brought about by Prof. Obasi, Secretary-General of WMO in March 2000 by a letter bringing to the attention of instrument and equipment manufacturers the possibility of establishing an association of manufacturers as a way to enhancing collaboration with WMO. In June 2002, consultative status at the WMO was granted to HMEI at EC-LIV. The association holds a general assembly that is organized to coincide with a major international industry equipment exhibition. As of 9 March 2005, 71 companies are registered as a member of HMEI. By joining the HMEI, each member can benefit from and contribute to knowledge gathered worldwide.

6.1.28 JAMIE was founded in 1953 by Japanese meteorological instruments companies (at present 44 companies). The objectives of JAMIE are the development, improvement, and progress of accuracy of hydrological and meteorological equipment; cultivation of demands; and spreading of and educating on hydrological and meteorological equipment. In order to strengthen its international as well as domestic activities, JAMIE plans to establish an International Technical Committee for Meteorological and Hydrological Equipment. EKO has been a member of JAMIE for about 40 years.

6.1.29 EKO Instruments Co., Ltd was founded in Osaka, Japan in 1927. It developed and manufactured the first dome pyranometer in Japan in 1955. It was certified ISO 9001 by Quality Management Systems, Japan in 1997, awarded an ASOS/NOAA contract to supply MS-092 sunshine duration meter in 1998, and developed Lidar System to measure

temperature/humidity/aerosol profile up to 5,000m in 2003. EKO provided pyranometers and solar radiation meters to Thailand, Ukraine, Mongolia and Indonesia in 1995, Swaziland and Republic of Yugoslavia (Serbia and Montenegro) in 2001, and Guinea Bissau and Serbia and Montenegro in 2003. EKO expressed its intention to remain involved in VCP activities in the future.

6.1.30 The IPM, noting with appreciation the information provided, encouraged the WMO Secretariat to continue its collaboration for mutual benefits to concerned organizations and to invite technical co-operation organizations to future meetings.

6.1.31 The meeting also reviewed success stories related to the VCP and technical co-operation projects which could serve as examples in the design and implementation of future projects. The following presentations were made: "A successful Partnerships SIDS and NOAA for the ISCS systems transitions and STAR4 workstation replacement" by Mr R. Masters, USA and "Enhanced application of climate prediction in Pacific island countries" supported by AusAID, by Dr V. Tsui.

### **Outstanding technical co-operation projects**

6.1.32 At the request of Members and in collaboration with regional and subregional organizations, WMO Secretariat has prepared draft project proposals (project briefs) in support of national and regional meteorological and hydrological activities linked to priority themes.

6.1.33 A list of some pipe-line technical co-operation projects is given in Appendix C. The list and individual project briefs are available on the TCO web page. WMO will continue assisting mobilizing resources for these projects.

## **6.2 Donors' contributions for 2004 and perspectives of VCP donors' contributions for 2005**

6.2.1 The meeting was informed of the VCP and related technical co-operation activities in 2004 and the plans of donor Members to support some of these VCP projects in 2005 and beyond and expressed the views that these plans could not be considered as firm commitments on the part of the donor Members as conditions could change and result in re-adjustment of their plans.

6.2.2 The statements related to the co-operation activities in 2004, and outlook for 2005 of Argentina; Australia; Canada; Chile; China; Finland; France; Germany; Hong Kong, China; Japan; New Zealand; Norway; Philippines; Republic of Korea; Russian Federation; South Africa, Spain; Switzerland, United Kingdom; and USA, including their contributions to the VCP(ES) and VCP(F) and information on bilateral activities, are given in the following paragraphs. The meeting was pleased to note that many donor Members contributed and plan to contribute to various trust funds, tsunami-related WMO initiatives and the transition to RS92 as well as the general contributions to the VCP.

### ***Argentina***

6.2.3 In 2004, Argentina continued its activities as a donor to the Spanish-speaking countries of Regions III and IV (cost estimated at US \$12,200).

6.2.4 The following co-operation activities were carried out:

(a) Internships and short- and medium-term courses at RMTTC Buenos Aires. Two participants from other countries of RA III attended each of the following two courses in Buenos Aires (US \$5,600 for tuition fees):

- Meteorological Inspector (four months);
- Analysis and Interpretation of Satellite Imagery (six weeks);
- Operational Aeronautical Meteorology (two weeks);

(b) Granting to certain Members of RA III of password-protected access to value-added products developed by RSMC Buenos Aires, which are published on the restricted-access Internet site of the Servicio Meteorológico Nacional (SMN) of Argentina;

(c) Installation and instruction of an Observational Meteorological System (SOM) for access and automated consistency of meteorological data developed by SMN to one of the associated NMCs;

(d) Missions by Argentine experts to other NMHSs. The estimated Argentine share of the cost for these activities was US \$2,600.

- An expert in Numerical Weather Products and Data Processing was commissioned for two weeks to one of the associated NMCs;
- An expert in Radar and Meteorological Satellite was commissioned for three days to one of the associated NMCs;
- An expert in Data Processing and Verification Systems was commissioned for one week to one of the associated NMCs;
- An expert in Meteorological Instruments was commissioned for two weeks to one of the associated NMCs;

(e) Standard calibration and repair of other Members' meteorological instruments by the Regional Instrument Centre (RIC) in Buenos Aires. The cost of repairs and consumables was borne by Argentina, estimated at US \$4,000.

6.2.5 In 2005, the contributions are hopefully expected to be increased, and new activities will also be organized:

- Seminary on Basic Interpretation Radar (one week).

Also, offering the software and instructions to implement other SOMs for access and automated consistency of meteorological data developed by SMN to the NMHSs in Regions III and IV will be continued.

### ***Australia***

6.2.6 Australia's total VCP contribution in 2004 was US \$370,250, of which US \$30,000 was for VCP(F). Australia completed two VCP(ES) projects through WMO:

- (a) Papua New Guinea OB/1/2/4 - Rehabilitation of Port Moresby GUAN Station; and
- (b) Fiji AEM/3/1/2 - Replacement of the WAFS STAR4 Workstation (jointly with Japan).

Total contribution in 2004 in these areas amounted to US \$27,250.

6.2.7 A number of bilateral projects implemented were related to the 2004 VCP theme on bridging the gap in the information age (e.g., SATAID, RANET, Registered User Internet Services, transfer of tropical cyclone module). For the Pacific, in addition to a continuation of the AusAID-funded project on "Enhanced Applications of Climate Predictions in Pacific Island Countries", a senior forecaster was seconded to RSMC Nadi to assist with forecasting during the 2004 tropical cyclone season, and spares and radiosonde consumables were provided to Fiji and Papua New Guinea respectively. Also, the AusAID-funded Sea Level and Climate Monitoring Project for the Pacific continued in 2004. Bilateral co-operation was carried out with a number of other developing countries, such as Indonesia and Viet Nam on radar-related activities.

6.2.8 A breakdown of bilateral/multilateral contributions to technical co-operation (amounting to US \$181,200) is as follows:

- Activities associated with AusAID-funded Project "Enhanced Applications of Climate Predictions in Pacific Island Countries": US \$25,000;
- Satellite Animation and Interactive Diagnosis (SATAID) Project: US \$12,000;
- AusAID-funded RANET Project: US \$57,000;
- Secondment of senior forecaster to RSMC Nadi: US \$32,000;
- Spares/radiosonde consumables to Fiji/Papua New Guinea: US \$18,700;
- Contribution to AMDAR/DBCP/IO-GOOS: US \$36,500.

6.2.9 Considerable resources were devoted to training and fellowships (e.g., for Papua New Guinea, Samoa, Tonga, Namibia, Philippines, ACMAD and WMO Technical Conferences). There were eight overseas students in the Bureau of Meteorology Training Centre's Graduate Diploma in Meteorology Course 2004. The total contribution for training was US \$131,800.

6.2.10 Since several AusAID projects will be implemented in 2005, the prospects for Australian contribution on technical co-operation under VCP in 2005 are good. Lesotho has been awarded a bilateral fellowship to participate in the Graduate Diploma in Meteorology Course 2005.

### **Canada**

6.2.11 In 2004, the Canadian Climate Change Development Fund (CCCDF) funded projects related to VCP totalling US \$100,000. Canada entered into the third year of a four-year project with the Agrhymet Regional Centre, a specialized technical institution of CILSS (Permanent Interstate Committee for Drought Control in the Sahel) located in Niamey, Niger. Projects totalling some US \$235,000 were conducted under this agreement to strengthen the capacity in addressing climate change. These, along with some training activities, (e.g., management of NMHSs, technical training) result in total disbursements for 2004 of US \$385,000.

6.2.12 In 2005, Canada will focus on how the activities contribute to Sustainable Development, particularly how VCP and other instruments can work with the Global Earth Observing Systems of Systems (GEOSS) to improve access, volume and quality of data and products. As such, Canada shall be communicating its activities as responses to the Millennium Development Goals and the G8 S&T Action Plan for Sustainable Development as a means of attracting new investment. Proposals are being developed under the auspices of the Canadian Group on Earth Observations in partnerships with other sectors.

6.2.13 Canada is seeking to renew its commitment to the Agrhymet Centre to the end of 2005 for approximately US \$300,000. CIDA is expected to continue its funding through the Canadian Climate Change Development Fund (CCCDF) in 2005. With this and potential funding through the Canadian Group on Earth Observations, the expected total disbursements for 2005 are expected to amount to some US \$500,000.

### **Chile**

6.2.14 In May 2004, training courses have been carried out for professional staff from the Meteorological Service of Uruguay in areas of upper-air observations, aeronautical meteorology and satellite meteorology.

6.2.15 In 2005, fellowships will be provided for staff from RA III NMHSs within the framework of the "Seminar on operation of work stations for WAFS data and products using GRIB and BUFR" through the South American Office of the Organization of International Civil Aviation in Lima.

### **China**

6.2.16 China contributed actively to the WMO VCP Programme and related technical co-operation activities in 2004. This included a study tour, training courses, fellowships and donation of instruments and equipment, as well as cash contributions to the VCP(F), IPCC Trust Fund and IMO reconstruction Trust Fund, and also to the THORPEX Programme.

#### Study tour

6.2.17 A study tour was organized in conjunction with the International Symposium on Sand and Dust Storm in September 2004. Eight PRs/senior officials from WMO's six regions, as well as one representative from WMO, attended the study tour. The participants of the study tour visited the relevant CMA operation centres in Beijing and the meteorological services of various levels in Jiangsu and Liaoning Provinces and Shanghai, including RMTTC Nanjing.

#### Fellowships

6.2.18 Three training courses on satellite meteorology, long-range weather forecast and agrometeorology were held respectively in RMTTC Nanjing in 2004. A long-term fellowship for one graduate student from Yemen was provided. In addition, financial support to the seventh AMDAR Panel Meeting and the seventh Regional Workshop on Asian/African Monsoon Emphasizing Training were provided through VCP/China 2004.

#### Instruments and equipment

6.2.19 In 2004, through WMO VCP projects and bilateral agreements, China provided 300 radiosounds, ten transceivers and 50 radio telephones to the Democratic People's Republic of Korea (DPRK), an automatic weather station and a PC VSAT system to Myanmar, a PC VSAT system to Cambodia, two PCs to Kazakhstan, one network server, one workstation for modelling, one colour printer and one UPS to the United Republic of Tanzania. China also assisted DPRK by upgrading the GTS links between Beijing and Pyongyang, including training in Beijing.



Cash contribution

6.2.20 Contributions of US \$10,000 to the VCP(F), US \$10,000 to IPCC Trust Fund, US \$10,000 to IMO reconstruction fund and US \$10,000 to the THORPEX Programme were made in 2004.

6.2.21 In 2005, China will continuously commit itself to the WMO VCP and related technical co-operation activities. A study tour will be organized (late August/early September), three international training courses on monsoon meteorology, administration and the detection of severe convective storms by Doppler radar will be held in RMTTC Nanjing and Beijing, respectively. Equipment and instruments will be donated to Cambodia, DPRK, Maldives, Myanmar, etc. In addition, cash contributions will also be made to the IPCC Trust Fund, VCP(F), THORPEX and WMO Emergency Assistance Fund.

**Finland**

6.2.22 In 2004, Finland continued to support the meteorological reconstruction programme of the Mozambique Meteorological Service with €765,000. Furthermore, Finland, in collaboration with WMO, continued to support the preparedness to climate variability and global change in Small Island Developing States (the total budget of the project 2001-2004 amounts to US \$3.4 million).

6.2.23 Finland has also supported a preparatory phase for a Pilot Project for the Development of an Automated Weather Service Production System for the Caribbean area by an amount of €100,000.

6.2.24 In 2005, Finland continues to provide support to the meteorological reconstruction programme of the Mozambique Meteorological Service with an amount of €950,000. The Pilot project for the Development of an Automated Weather Service Production System for the Caribbean area in cooperation with WMO will be supported by an amount of approximately €250,000.

**France**

6.2.25 In 2004, France has continued support to the VCP(ES) Programme and its active technical policy including the support of many WMO activities and programmes such as the WMO Volta-HYCOS project for which the French Ministry of Foreign Affairs contributes €1 million.

Support to VCP(ES) projects

6.2.26 In 2004, France has finalized and implemented the following projects:

*(a) Projects completed*

- Bosnia and Herzegovina TE/6/3/2 - Implementation of a RETIM2000 receiver and a Synergie forecaster workstation
- Madagascar WCP/2/1/1 - Implementation of the CLISYS system
- Dominica OB/2/3/2 - Provision of a terminal Aeroview
- Egypt - Expert mission for barometers calibration

*(b) Projects almost completed (purchase orders placed, work in progress)*

- Bolivia TE4/2/2 - Automation of the Telecommunication Centre of La Paz including an Automatic Message Switching System and a Forecaster Workstation Synergie working under Linux
- Automation of NMC in Armenia (TE/1/1/3 (Revised)), Georgia (TE/6/3/2) and the Republic of Moldova (TE/4/2/1 (Revised))
- Armenia OB/1/3/1 - Provision of spare parts for the electrolytic hydrogen generator

*(c) On-going project (project funded, but not yet initiated)*

- Kenya - provision of a Transmet system

6.2.27 Within the framework of the RETIM Africa project, France has supported the second meeting of the Co-ordination/Steering Committee on RETIM Africa, which was established by RA I at its thirteenth session (Mbabane, Swaziland, November 2002) and took place in Paris, France from 3 to 4 June 2004.

Support to WMO programme activities*(a) Support to workshops and training events*

6.2.28 In 2004, France supported several workshops, in general by allocating funds for the participation of meteorologists from developing countries:

- Dakar, Senegal, Seminar for Weather Presenters (€1,500)
- Langen, Germany, First RA VI Training Workshop on PWS (€2,000)
- St Petersburg, Russian Federation, support of the CBS Technical Conference (€3,500)

*(b) Support to WMO activities and programmes through trust funds*

6.2.29 In 2004, France has contributed an amount of €23,000 to the trust fund of the AMDAR panel and an amount of €10,000 to the trust fund of the THORPEX project.

*(c) Support to the Volta-HYCOS project*

6.2.30 France contributes, through the French Development Agency (the operator of the French Ministry of Foreign Office for the implementation of co-operation) €1 million to a WMO HYCOS project for West and Central Africa.

Bilateral co-operation

6.2.31 In 2004, France welcomed many trainees and scientists from foreign countries, notably for the ALADIN project, such as the Albania, Algeria, Austria, Belgium, Benin, Bulgaria, Burundi, China, Croatia, Czech Republic, Estonia, Germany, Hungary, Italy, Côte d'Ivoire, Morocco, Poland, Republic of Moldova, Romania, Slovakia, Slovenia and Tunisia. The time spent in Météo-France by the trainees amounts to a total of 257 months, with 219 meteorologists from several countries in most cases with financial support from France.

Expert services

6.2.32 In 2004, Experts from Météo-France made assistance missions in several developing countries, in some cases with the financial support of WMO. A list of the countries is as follows: Algeria, Bulgaria, China, Cuba, Egypt, Madagascar, Morocco, Niger, Poland and Tunisia. The total time involved is about six months.

Technical co-operation activities for 2005

6.2.33 In 2005, France will maintain its support for many training actions and common research actions, in particular with the ALADIN project. France will also continue its support to the trust funds of AMDAR, THORPEX, and IPCC and to training assistance to the ACMAD Centre.

6.2.34 The French Ministry of Foreign Affairs has initiated a new research project on climate variability and global change in West Africa. This project entitled "Ripiecsa" will have a component of support and capacity building of the Meteorological Services in the Region. It is planned that the first meeting of this project should take place in Niamey at the beginning of 2005. The Ministry of Foreign Affairs has also announced an increase of the voluntary contributions of France to the technical co-operation UN bodies in 2005.

Assistance to the South-West Pacific Islands

6.2.35 France has applied for a project of rehabilitation of meteorological infrastructure and equipment in Vanuatu and Samoa through the Pacific Fund. If accepted, this support could amount to €300,000 for Vanuatu and €50,000 for Samoa. Under the Pacific fund, France also requested support for the RANET Project and the organization in French Polynesia of a training course on maintenance for technicians from South Pacific Islands Meteorological Services.

6.2.36 It is expected that the Ministry of the Overseas Territories, through the Pacific fund, will contribute to the rehabilitation of the Meteorological Services of Vanuatu, Fiji and Samoa in 2005.

**Germany**

6.2.37 Germany has continued to provide assistance in education and training and fellowships, mostly on a bilateral basis, and especially for short-term fellowships on a cost-sharing basis in the field of research and development.

6.2.38 In connection with the tasks to which it is committed within the framework of WMO, Germany continues to support, for example, the WMO RA VI Regional Dobson Calibration Centre, and the GAW Training and Education Centre, both at Hohenpeissenberg.

6.2.39 Fourteen countries are being supported in their operational use of the "HRM" NWP model by special provision of boundary data. In 2005, in the framework of the Emergency Assistance Response Team (EART) for the Reconstruction of the Iraqi Meteorological Organization (IMO), Germany is prepared to provide IMO with meteorological equipment for approximately 60 weather stations.

6.2.40 From early 2005, Germany will be providing through WMO every Member country with the "METDATA Monitor" software, which offers the possibility to use on a standard PC the same procedures for the global and special monitoring of the data traffic as in an RTH. The use of the software is free for all WMO Members.

6.2.41 With regard to training, Germany increased its efforts in support of WMO-sponsored training courses. In 2004 the international seminar for participants from central and Eastern European countries on the Design, Products and Operational Use of the NWP Model-chain of RSMC Offenbach again took place. In addition, the WMO PWS Workshop was organized in October 2004 with many participants from central and Eastern Europe. In September 2004, the first HRM workshop was carried out together with INMET, Brazil, in Rio de Janeiro.

6.2.42 In the area of Operational Hydrology, Germany concentrated on supporting participants to give them the possibility to join WMO-sponsored conferences. The International Conference on Hydrology of Mountain Environments took place in Berchtesgaden from 27 September to 1 October 2004. It was convened and organized by the German IHP/HWRP National Committee together with, among others, WMO. Travel and accommodation expenses for two participants from India and Uzbekistan to the amount of €2,500 were borne by the IHP/HWRP Secretariat.

6.2.43 Similarly, the support of €2,500 was provided to two participants from Nepal and Cameroon to attend the International Workshop on Hydrological Extremes - Modelling and Managing Low Flows, Droughts and Floods, which was held in Koblenz from 5 to 8 July 2004. This workshop was convened and organized by the German IHP/HWRP National Committee in co-operation with the IHP of UNESCO and the HWRP of WMO.

6.2.44 Among the bilateral technical co-operation projects the following should be mentioned:

- Support to the Water Management Authority in Kenya to establish a hydrological network;
- Support to the Hydrological Service of Algeria, especially "Integrated Water Management"; and
- Support to prepare an air quality measurement programme in Damascus, Syria.

6.2.45 In 2005, Germany will also be participating in the follow-up activities for the Tsunami disaster of December 2004. Germany will continue to provide technical assistance, mostly on a bilateral basis, and taking into consideration the relevant recommendations of WMO bodies. In addition, emphasis will be placed on support to WWW System Support Activities by means of seconded experts, training, etc.

### ***Hong Kong, China***

6.2.46 Hong Kong, China continued to contribute to VCP(ES) in 2004 by offering training fellowships to 19 meteorologists from Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, China, Iran, Lao People's Democratic Republic, Latvia, Lithuania, Malaysia, Myanmar, Russian Federation, Sri Lanka, United Republic of Tanzania, Thailand, Uruguay, Vanuatu, Socialist Republic of Viet Nam and Zimbabwe. Two training courses were conducted, namely, "Provision of Weather Service via the Internet" from 8 to 12 March 2004 and "Aviation Meteorological Services" from 22 to 26 November 2004. Through lectures and practical sessions, the training courses aimed at enhancing the capability of trainees in providing weather information via the Internet and increasing their knowledge on the provision of aviation weather services respectively. The total contribution in monetary terms for these two courses was US \$48,000, inclusive of per diem allowances, accommodation costs, a limited number of air passages, and staff and preparation costs.

6.2.47 In 2005, Hong Kong, China will continue to contribute to VCP by repeating the course on aviation meteorological services. This arises from the overwhelming response to the course held in 2004. Hong Kong, China also plans to conduct in late 2005 a course on the design and operation of meteorological warning systems.

### ***Japan***

6.2.48 In 2004, Japan made a cash contribution of US \$165,000 to the VCP Programme and supported training/fellowship activities to the value of US \$250,000.

6.2.49 The training courses and workshops hosted and financially supported by Japan in 2004 were as follows:

- (1) A three-month Group Training Course in Meteorology, funded by the Japan International Cooperation Agency (JICA), was offered to eight participants from eight countries from 21 September to 18 December 2004. In this training, course lectures and exercises were made on the application techniques of NWP products, satellite images, and climate analysis and prediction products.
- (2) On-the-job training for typhoon forecasters was offered to two woman forecasters from Malaysia and Hong Kong, China from 28 July to 6 August 2004.
- (3) The International Training Seminar on Typhoon Monitoring and Forecasting in the western North Pacific was held from 12 to 27 February 2004 with the participation of four countries in the Asia-Pacific region.

6.2.50 The bilateral/multilateral technical cooperation activities carried out by Japan in 2004 and their prospects for 2005 are as follows:

- (1) In July 2004, Japan approved to implement a Grant Aid Project in Lao People's Democratic Republic aiming at improvement of the weather monitoring system. This two-year (2004-2005) project includes installation of a meteorological radar system and a MTSAT data receiving/analysis system at Vientiane, and training of meteorological personnel for the operation and maintenance of the system.
- (2) A two-year (2003-2004) Grant Aid Project in Mongolia to improve the meteorological observation network ended in November 2004. Installation of 14 AWSs, upgrading of three upper-air observation stations and installation of a VSAT system were completed. To ensure the effective use of the above system, another three-year technical cooperation project to improve the capacity for weather forecasting and analysis was launched in January 2005.
- (3) The upgrading of the GTS circuit between Tokyo and Manila was conducted through a JICA technical cooperation project. Migration to TCP/IP (64K bps) procedure was completed in September 2004.
- (4) A project to support a training programme conducted by the Fiji Meteorological Services (FMS) for the participants from the Pacific Meteorological Services is being implemented. This is a five-year (2001-2005) project of JICA and a Japanese expert is dispatched to the annual seminar as a lecturer.
- (5) Three meteorological instruments companies in Japan provided in-kind supports to the following countries through VCP:

Vanuatu	meteorological balloons,
Mozambique	meteorological balloons,
Guinea-Bissau	pyranometer with radiation integrator,
Serbia and Montenegro	pyranometer with radiation integrator, and
Kiribati	anemometer.

6.2.51 In 2005, Japan will continue to contribute to the VCP(F) and training/fellowship activities at the current level. In addition, meteorological instruments companies in Japan will continue their support through VCP projects.

**New Zealand**

6.2.52 New Zealand's assistance to developing NMS is nearly all bilateral in nature. The necessary funding to provide this assistance continues to be secured through both a supply contract with the New Zealand Government for "public good" services and through other New Zealand agencies on a project basis. Outputs are defined and New Zealand does not have access to discretionary funding to provide assistance through funding streams such as VCP(F). In addition to the support provided with New Zealand funding, MetService also provides substantial technical resource for routine operational support and project implementation in the South Pacific region which is funded from agencies outside of New Zealand. The value of this work is not included in the New Zealand financials, but should be noted in this report.

6.2.53 During the 2004 calendar year, New Zealand continued to advise and assist the Pacific countries of Cook Islands, Kiribati, Niue, Samoa, Tokelau, Tonga and Tuvalu. All countries received remote on-going advice and assistance for computer and other operational problems, and an annual re-supply of meteorological forms. MetService continues to monitor surface observation reporting performance for the assisted countries and provides an email gateway to the GTS. Internet usage in countries is outstripping capacity and the use of email for operational traffic is becoming problematic.

6.2.54 Country visits were made to Cook Islands, Tokelau Islands, Niue, Kiribati, Tuvalu and Vanuatu. Emergency assistance following Tropical Cyclone "Heta" was provided to Niue to restore a basic observing programme and communications with New Zealand and UK funding. Subsequently the AWS was restored with funding from France and Australia. A new AWS was installed at Tokelau Islands with New Zealand support. New Zealand continued to manage and technically support the upper-air programmes at Tarawa, Funafuti and Penrhyn. This also included some financial support, although consumables and operating costs for these programmes are primarily funded by UK with support from VCP and GCOS in the case of Penrhyn. The wind-finding system at Penrhyn was extended to include radiosonde from 1 November 2004.

6.2.55 New hydrogen plants and back-up solar power systems were installed at Tarawa and Funafuti GUAN stations with UK funding. GCOS funding through VCP was provided to install a new hydrogen plant at Galapagos Islands, Ecuador and to provide enhanced technical assistance for GUAN and GSN stations in the region.

6.2.56 New Zealand was a co-initiator of RANET in the region and has provided presentations to stakeholders and advice to agencies that have subsequently become involved. It is at present technically implementing RANET projects in Vanuatu (in collaboration with Australia) with UK and US support, and in Niue funded by New Zealand.

6.2.57 New Zealand continues to fund the preparation and publication of the monthly "Island Climate Update". It is actively contributing to the Pacific Island GCOS and communications solutions such as HF and satellite email, and EMWIN.

**Norway**

6.2.58 Through the WMO Trust Fund arrangements for assisting Members in RA VI in procuring MSG satellite data receiving equipment, Norway provided funding in 2003/2004 for assisting the Meteorological Services in Serbia and Montenegro, Bosnia and Herzegovina and Latvia in procuring MSG receiving equipment.

6.2.59 For 2005 no commitments concerning funding can as yet be made. However, efforts will be made to provide some modest support.

### ***Philippines***

6.2.60 In November 2004, a two-year Master's Course in Meteorology commenced for WMO fellows from Myanmar, Sri Lanka and Vanuatu at the University Component of the RMTTC (Philippines). The fellows are expected to complete their studies in 2006, by which time the Philippines would have contributed a total of about US \$5,000.

6.2.61 In 2005, the Philippines expect to support the participation of an unspecified number of fellows from other countries for the Advanced Weather Forecasting Course to be conducted during the last quarter. Likewise, the Philippines anticipate the provision of additional short- and long-term VCP fellowships during the year, beginning in June or November.

### ***Republic of Korea***

6.2.62 In 2004, the Republic of Korea contributed the sum of US \$156,000 to the WMO VCP and related technical co-operation activities, which was composed of US \$5,000 through VCP(F) and US \$151,000 to VCP(ES). A cash contribution of US \$5,000 to the VCP(F) was made.

#### *Training and Fellowships*

6.2.63 The following training course and seminar were conducted in Korea with full financial support from the Korea International Co-operation Agency (KOICA).

- Three-week annual training course on Weather Forecasting for Operational Meteorologists from 5 to 30 April 2004. Nineteen weather forecasters from fourteen WMO Members participated;
- Second one-week Seminar on Meteorological Technology and Policy for National Meteorological Services (NMSs) was held with the participation of fifteen Directors or senior officials of NMHSs.

#### *Equipment and services by bilateral arrangements*

6.2.64 The Republic of Korea continued to carry out a pilot project to provide the Mongolia Meteorological Service (NAMHEM) with a PC-based Numerical Weather Prediction (NWP) system through the provision of PC cluster equipment to NAMHEM and the dispatch of clustering expert teams for an experimental run of the Mongolian NWP System.

6.2.65 In 2005, the following contributions to the WMO VCP and related technical co-operation activities are expected to be made by the Republic of Korea.

- Cash contribution of US \$5,000 to the VCP(F);
- Cash contribution of US \$4,000 to the AMDAR trust fund;
- Holding of annual training course on Weather Forecasting for Operational Meteorologists, especially with the allocation of more places for the participants from Least Developed Countries; and
- Continuous technical assistance to the PC-based Mongolian NWP System.

### ***Russian Federation***

6.2.66 In 2004, the total amount of the contribution from the Russian Federation was US \$210,000, mainly for the following activities:

(a) Long-term fellowships - 31 VCP fellows within WMO RMTC-Russia (US \$170,500);

(b) Short-term fellowships - Training of specialists on Advanced Training Institute courses (US \$21,500);

(c) Provision of GIS-Meteo system to Kazakstan (US \$3,600), TV-Inform-Meteo System to Moldova (US \$3,600) and completion of the work on the modernization of the upper-air system in Kyrgyz Republic (US \$10,800).

6.2.67 In 2005, it is expected that the contribution of the Russian Federation to the WMO VCP will be about US \$220,000. The specific voluntary co-operation projects that the Russian Federation intends

### ***South Africa***

6.2.68 In 2004, South Africa provided four mercury barometers to the Mozambique Meteorological Service aiming at enhancing the meteorological observations in the country and assisted in the re-establishment of GCOS upper-air station at Windhoek, Namibia. Within the framework of the USA project to deploy 262 drifting weather buoys in the South Atlantic, South Africa funded the upgrading of the barometer.

6.2.69 South Africa hosted a visiting scientist from Eritrea for two weeks whilst carrying out training in seasonal forecasting, in line with a capacity building initiative of African scientists, aiming at enhancing seasonal prediction skills. Also, participants from four countries (Swaziland, Mauritius, Eritrea and Tanzania) were sponsored to attend a workshop on seasonal predictions in South Africa.

6.2.70 In 2005, South Africa will continue to support the VCP Programme in the field of cooperation with the provision of barometers to the Malawian Meteorological Service, and the setting up of a NWP system to an interested SADC Meteorological Service, and the supply of an engineer to evaluate the radiosondes system and the Stuart Electrolytic Hydrogen Generator of the Zambian Weather Service. It is also proposed to host a visiting scientist from Eritrea for three months working as a partner on a project in seasonal forecasting.

### ***Spain***

6.2.71 The overall contribution of Spain to the VCP in 2004 was US \$550,815, broken down as follows:

#### ***Education and training fellowships***

6.2.72 This represented the most significant part, with long-term (21 months) and short-term (two months) courses and their corresponding fellowships amounting in 2004 to US \$317,180. For 2005, the contribution of Spain is estimated at about US \$487,390, for short- and long-term courses according to training goals of countries in several applied meteorology courses or courses in specific areas.



### Multilateral co-operation activities

6.2.73 The Conference of IberoAmerican Directors is a forum which co-ordinates and keeps track of the weaker areas in meteorology and related matters in the region. Meetings and seminars have been promoted in 2004 as a first step in assessing the appropriate priority for 2005.

6.2.74 In view of the importance of the regional project ACMAD to provide support for the sustainable development of NMHSs in Africa, Spain has offered a voluntary contribution in 2004 amounting to US \$115,635, and a contribution of US \$118,300 is expected for 2005.

6.2.75 Since the participation of experts from developing countries is highly appreciated in IPCC activities, Spain has offered a voluntary contribution in 2004 amounting to US \$118,000, and a similar contribution is expected for 2005.

6.2.76 In 2005, Spain will be considering the best way to participate in providing assistance in the support of NMHSs affected by the Tsunami in the Indian Ocean in December 2004.

### **Switzerland**

6.2.77 Switzerland is continuously operating the following central facilities in favour of the GAW Programme:

- World Calibration Centre and Quality Assurance/Science Activity Centre for ozone, carbon dioxide and methane at the Swiss Federal Laboratories for Materials Testing and Research (EMPA, Dübendorf): EMPA provides calibration services, station audits, training and operational support of the global GAW network;
- World Optical Depth Research and Calibration Centre (WORCC) at the World Radiation Centre (Davos): After supply of precision filter radiometers, WORCC is providing quality control and quality assurance for the operational aerosol optical depth measurements at a dozen of the global GAW stations.

6.2.78 MeteoSwiss and EMPA regularly provide capacity building and consumables to the global GAW station in Kenya. Following the recommendation of the Commission for Atmospheric Sciences (CAS) and the Commission for Instruments and Methods of Observation (CIMO) a calibration centre for infrared radiation has been established in Davos, Switzerland. As for the existing World Radiation Centre, the financing is granted by the Swiss Government, the Canton of Grisons and the township of Davos.

6.2.79 Switzerland continued its substantial contribution to the AMDAR Panel. With regard to RA VI, during 2004, Switzerland supported the RA VI Subregional Office with a cash contribution. Following a request from the Director of the Nepal Department of Hydrology and Meteorology, Switzerland organized and financed a course in mountain meteorology for a forecaster from Nepal.

6.2.80 According to the current plans, the total contributions for 2005 will be approximately six per cent higher than in 2004.

### **United Kingdom**

6.2.81 In 2004, the UK used its participation in the VCP in order to achieve three main outcomes:

- Improved protection of life and property from the effects of natural disasters through the provision of sustainable services by developing country National Meteorological Services (NMSs);
- Improved understanding of the effects of global climate change through the taking of new climate observations and the archiving of existing records in countries not able to support these activities themselves;
- Rapid restoration of life-critical services by NMSs whose countries have been affected by natural disasters or are emerging from conflict.

6.2.82 Project highlights from 2004, which contributed to these outcomes, were:

- Installation of media systems in Sri Lanka and the Maldives;
- Training of three students to MSc level at Reading University, with two of those students being accepted by the University for further study (including one PhD);
- Further support to Statistics in Applied Climatology courses in Africa, including the development of an e-learning module;
- Support to MSG training to non-PUMA countries in Africa;
- In co-operation with the USA, installation of a new GUAN station at Gan, Maldives;
- In co-operation with MetService, New Zealand, support to three GUAN stations in the South Pacific, and emergency relief efforts to Niue following a tropical cyclone;
- Provision of consumables for the operation of the GUAN stations at Seychelles and Gough Island;
- Completion of the development of CLIMSOFT, an Access based CDMS;
- Contributions to the rebuilding of the Iraqi Meteorological Organization, both in cash and in kind; and
- Missions to assess the state of the meteorological infrastructure following conflict in Sierra Leone and Liberia.

6.2.83 In 2005, the UK intends to achieve the same desired outcomes through VCP. A similar portfolio of projects will be conducted, including:

- Emergency relief to Maldives and Seychelles following the Indian Ocean Tsunami;
- The development of, and training in the use of, high-resolution NWP output to African NMHSs;
- Upgrades to GUAN stations, including the upgrade of Yerevan, Armenia in co-operation with the USA;
- Upgrades to media systems in Mali, Burkina Faso, Guinea, Democratic Republic of the Congo, Djibouti and others; and
- Training workshop for implementation of CLIMSOFT starting with some of the South Pacific SIDS.

### **United States of America**

6.2.84 In 2004, the USA contributed \$2 million dollars to the VCP(ES) in a number of areas including:

- *International Training Desks* - In the area of training and fellowships, the USA trained 23 international students at the Tropical, South American and African training desks, located at the National Centre for Environmental Prediction, and six students at the Pacific Training Desk in Honolulu.
- *Hurricane Attachments to the Tropical Prediction Centre (TPC)* - Central American and Caribbean forecasters were invited to NOAA's TPC to experience the hurricane season and understand the US system of hurricane prediction, early warning and post disaster management.
- *Distance Learning Masters Degree* - The USA has begun to fund the development of a Distance Learning Masters degree programme with possible collaboration with Costa Rica University, Florida International University, COMET and Erasmus University of Netherlands. COMET also continued to receive funds for translating satellite training and education modules into Spanish.
- *ISCS Workstation Maintenance and Communications* - In the area of VCP projects, the USA sustained contracts to maintain the ten workstations for ISCS/WAFS, largely focused on Central American countries. In addition, USA continued the support of the Caribbean weather website ([www.caribweather.net](http://www.caribweather.net)) which contains weather information for all countries surrounding the Caribbean.
- *AMDAR and World Climate Programme* - The USA also continued its support for the AMDAR Panel and AMDAR projects. Funding was given to WMO to assist with the stipend for a visiting scientist to help plan a World Climate Programme conference.
- *AMS International Meeting in Seattle* - In the area of equipment and services by bilateral arrangements, the USA supported 21 participants in the American Meteorological Society's Annual Meeting and associated International Session in Seattle in January 2004. NOAA also continues to fund the AMS electronic journals project in collaboration with NASA and NSF to supply professional meteorological research journals to developing countries.
- *Satellite Direct Read Out Conference in Miami* - NOAA helped to support 16 participants from Latin America and the Caribbean attend a conference on the evolution of satellite technology and to discuss means for developing receive and data use capabilities throughout the region. This conference inspired a larger initiative to enhance satellite use and capabilities in the Americas – the Earth Observation Partnership of the Americas which will continue to be developed in 2005.
- *RANET in the Pacific and Africa* - The USA also worked with the United Nations, Small Islands Developing States Programme (SPREP) and other partner countries in the Pacific to promote a Pacific-area communications development project patterned after the successful Radio and Internet Satellite communications project (RANET) in Africa. The village of Siviri in Vanuatu received a RANET system that links it to the main Meteorological Service in Vanuatu which is now connected to the ISCS. Training was given to the meteorologists and community in communications. A larger version of the RANET programme was installed in the outer islands of Yap, Micronesia providing HF radio and satellite communications to 14 remote communities. Additional RANET projects in the Pacific are being considered for 2005. USA

VCP support will be given for RANET development projects in Morocco, Ethiopia, and the Democratic Republic of Congo that are also planned for 2005.

- *Desktop Weather Forecasting - PC-ETA* - The USA continues to work on desktop regional forecasting model using Internet initial conditions from global models for developing countries. Testing is expected in 2005 in Viet Nam, Saudi Arabia, and Costa Rica.
- *GCOS and Regional Maintenance* - NOAA and the Department of State continued support to the GCOS Office for climate observations and regional maintenance projects in addition to what was available directly from VCP funds.
- *Flood Forecasting Workshop* - Funds have been dispersed for the development of a Flood Forecasting Workshop scheduled for September 2005 for hydrologists, meteorologists and policy makers.
- *Climate Applications Workshop* - The USA has provided funding to the 5<sup>th</sup> Climate Applications Workshop focused on the Indian Ocean region which takes place in autumn, 2005.

6.2.85 In 2005, the following projects are planned:

- *Emergency Assistance for Disasters Funding:* In 2005, the USA plans to provide in-kind support to the WMO Emergency Assistance Fund to help countries recover from natural disasters. The USA will also sponsor a Tsunami and Early Warning workshop in Honolulu for the Indian Ocean region in May 2005. It will maintain funds for Iraq assistance if such assistance is possible in 2005.
- Projects to modernize Meteorological Services are also in progress in India, Romania, Mexico and other countries to a lesser extent. Additional projects are being considered for funding especially in conjunction with Tsunami relief efforts.
- A Commons Policy Study Workshop will be supported in partnership with the National Association of Scientists and other UN partners to discuss the growing importance of international data exchange policy.
- ACMAD will be supported to upgrade its ISCS workstation as the USA continues working to ensure successful transition of the ISCS to TCP/IP protocol and binary codes. An ACMAD-CIMMS co-operative research and education programme will be supported in 2005.
- A Webmasters training for RA IV should be funded in 2005 and preparations for a training in RA III in 2006. A project proposal to develop an RA V Regional Climate Centre (RCC) will be funded later in the year.
- The USA will continue working to develop the Distance Learning Masters Programme. We will also continue to fund our International Desks at NCEP and in the Pacific. This year our Pacific Desk trainer will provide on island training.
- Data Rescue efforts will continue in Africa and the Americas. US VCP will add to NOAA funding to provide seed funds to develop the Earth Observation Partnership in the Americas and will assist in funding a workshop in June 2005 in Argentina.
- In the Pacific, the USA will focus on ISCS two-way capabilities, RANET and EMWIN. It will also continue to support the translation of available CD training modules into Spanish and provide BUFR and GRIB training in coalition with FAA. In January 2005, the USA expects to continue sponsoring the AMS Annual Meeting International Session.

### **6.3 Other related technical co-operation activities for 2005**

6.3.1 The meeting noted that at the request of Members and in collaboration with regional and subregional organizations, the WMO Secretariat has prepared draft project proposals (project briefs) in support of national and regional meteorological and hydrological activities linked to priority themes. The list of outstanding technical co-operation projects and individual project briefs are available on the TCO web page. WMO will continue assisting mobilizing resources for these projects.

## **7. PREPARATION FOR THE NEXT MEETING**

### **7.1 Election of the Chair** (*Agenda item 7.1*)

7.1.1 Mr Steve Palmer (UK) was unanimously elected Chairman during the meeting. The meeting agreed that the Interim-Chairman should continue to lead the IPM and liaise with members and the WMO Secretariat to ensure appropriate follow-up actions and to assist in preparation for the next meeting. Mr Palmer will present the report of IPM/VCP/TCO(2005) to the EC Advisory Group of Experts on Technical Co-operation and the Executive Council.

### **7.2 Date and place of the next meeting**

7.2.1 In view of the resource mobilization opportunities located in Geneva, the meeting decided to hold the 2006 IPM in early March (four days) in Geneva, back-to-back with the next session of the EC Advisory Group of Experts on Technical Co-operation. The meeting expressed the opinion that it would be advantageous if the 2007 IPM could be held in a developing country, preferably in Region I.

### **7.3 VCP theme for 2006**

7.3.1 The meeting noted that the theme for World Meteorological Day 2006 would be: "Preventing and mitigating natural disasters". In this connection, the meeting proposed that the VCP theme for 2006 would be "Preventing and mitigating natural disasters through voluntary co-operation".

### **7.4 Topics to be taken up during the next meeting**

7.4.1 The meeting agreed that the main items to be discussed during the next session would include:

- (a) Trends and development since the last IPM;
- (b) Theme;
- (c) Success stories; and
- (d)
  - Review of VCP requirements from Members;
  - Review of areas/subjects which should be given special consideration;
  - Review of on-going projects within the framework of WMO Technical Co-operation Programme; and
  - Review of the requests and of the proposed support from donors and co-ordination among donors.

In view of the usefulness of exchanging information, the meeting agreed that the breakout group meetings be continued.

7.4.2 The meeting agreed that resource mobilization partners in the region, such as UNDP, UNOPS, the World Bank, the European Commission, UN Office for the co-ordination of Humanitarian Affairs (UNOCHA), and the International Strategy for Disaster Reduction (ISDR) be invited to the next IPM meeting and requested the Secretariat, in consultation with the Chairman, to look at and prepare a preliminary list of potential invitees.

## **8. ANY OTHER BUSINESS**

### **8.1 Recommendations of Breakout Groups**

8.1.1 Following breakout group discussions, the meeting considered with special attention some topics of major interest and concern to members and expressed its views and recommendations as given in Annex XIII.

### **8.2 IPM views on the proposed International Symposium on Technical Cooperation**

8.2.1 The meeting discussed the relevant issues for the preparation of the International Symposium on Technical Co-operation proposed to be convened during the next Financial Period. Whilst many participants considered that the concept was good, some were of the opinion that further investigation had to be carried out to make it more effective, for example, on whether it could be held co-jointly with another related WMO activity, such as the Conference on Economic and Social Benefits of NMHSs or the GEO Capacity Building Conference now under consideration, or regional meetings.

## **9. ADOPTION OF REPORT AND CLOSURE OF THE MEETING**

9.1 The meeting reviewed the draft Report and requested the Chairman to approve the Final Report on its behalf.

9.2 The Chairman expressed appreciation on behalf of all participants to the Director-General of the Japan Meteorological Agency and his staff, in particular, the staff of the Office of International Affairs, for the excellent hospitality and facilities which were made available in support of the meeting.

9.3 The Chairman also expressed appreciation to the WMO Secretariat staff and the ex-Chairman, Dr Tsui for their support for the meeting.

9.4 The meeting was closed at 16h35 on 11 March 2005.

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**ANNEX I**

**LIST OF PARTICIPANTS IN IPM/VCP/TCO(2005)**

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### WMO SECRETARIAT

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Dr Tokiyoshi TOYA (C/VGP, RCD)  
Mrs Jacqueline HILLMAN (Secretary, VGP/RCD)  
Mr Dieter SCHIESSL (Director, WWW)  
Mr Momadou SAHO (C/FEL, ETR)  
Mr Hama KONTONGOMDE (WCD/WCP)

### LOCAL SECRETARIAT

Mr Ryuji YAMADA (Office of International Affairs, JMA)  
Mr Yutaka OGAWA (Office of International Affairs, JMA)

## **ANNEX II**

### **AGENDA**

1. OPENING OF THE MEETING
2. ORGANIZATION OF THE MEETING
  - 2.1 Adoption of the agenda
  - 2.2 Working arrangements
3. EVALUATION OF THE VCP AND RELATED TECHNICAL CO-OPERATION ACTIVITIES IN 2004
  - 3.1 Evaluation of VCP activities in 2004
  - 3.2 Review of other related technical co-operation activities in 2004
4. ASSESSMENT OF THE PRIORITY REQUIREMENTS FOR TECHNICAL ASSISTANCE IN SUPPORT OF WMO PROGRAMMES
  - 4.1 Priority VCP requirements in support of WMO Programmes for 2005
  - 4.2 Special items requiring urgent action under VCP
    - 4.2.1 Implementation of WAFS/RMTN systems
    - 4.2.2 Implementation of integrated global observations for climate
    - 4.2.3 Response to requirements of countries affected by natural disasters and those emerging from conflict
    - 4.2.4 Requirements of NMHSs in LDCs
    - 4.2.5 Education and training fellowships activities
    - 4.2.6 Other matters
5. MAJOR TRENDS, DEVELOPMENTS AND OPPORTUNITIES
6. OUTLOOK OF VCP AND OTHER RELATED TECHNICAL CO-OPERATION PROGRAMMES FOR 2005
  - 6.1 VCP activities for 2005 with emphasis on the 2005 VCP theme, "Technical Co-operation for sustainable development"
  - 6.2 Perspectives of VCP donors' contributions for 2005
  - 6.3 Other related technical co-operation activities for 2005
7. PREPARATION FOR THE NEXT MEETING
  - 7.1 Election of the Chair
  - 7.2 Date and place of the next meeting
  - 7.3 VCP theme for 2006
  - 7.4 Topics to be taken up during the next meeting
8. ANY OTHER BUSINESS
  - 8.1 Recommendations of Breakout Groups
  - 8.2 IPM views on the proposed International Symposium on Technical Cooperation
9. ADOPTION OF REPORT AND CLOSURE OF THE MEETING

**ANNEX III**

***Members' contributions to  
the WMO Voluntary Co-operation Programme  
in 2004***

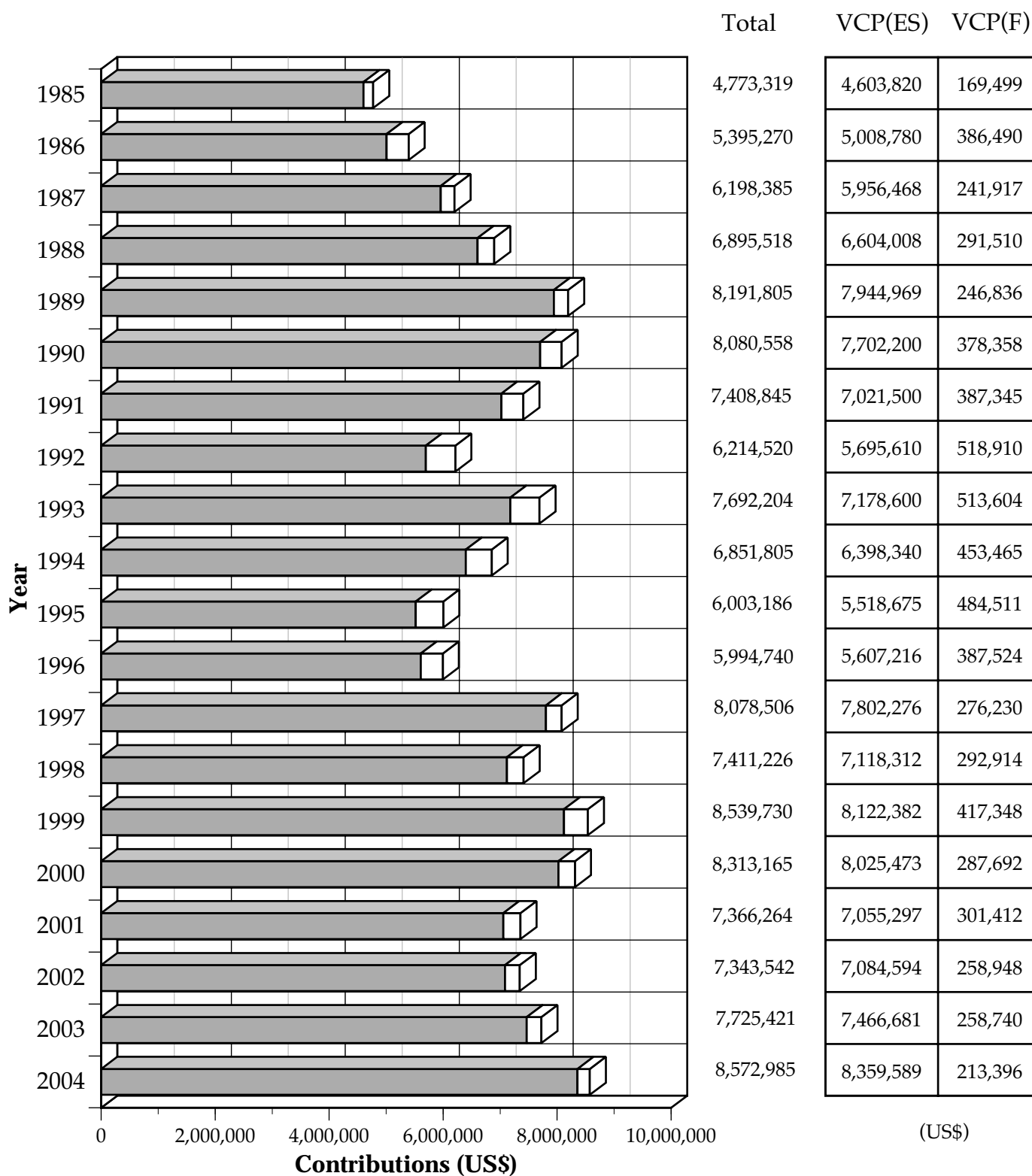
(US \$)

Donor Member	VCP(F)  (US\$)	VCP(ES)*				Total Contribution  (US\$)
		Equipment and Services through WMO	Equipment and Services by bilateral arrangements	Training/ Fellowships	VCP(ES) including fellowships Sub-total	
Argentina		2,600	4,000	5,600	12,200	12,200
Australia	30,000	27,250	181,200	131,800	340,250	370,250
Canada			385,000		385,000	385,000
Chile				5,000	5,000	5,000
China	10,000	218,590	23,090	205,490	447,170	457,170
Finland			403,000		403,000	403,000
France			128,545	779,555	908,100	908,100
Germany			163,700	73,500	237,200	237,200
Hong Kong, China				48,000	48,000	48,000
Ireland	8,621					8,621
Japan	140,000	25,000		250,000	275,000	415,000
Mauritius	1,316					1,316
New Zealand			263,029		263,029	263,029
Pakistan	534					534
Philippines				420	420	420
Republic of Korea	5,000		23,000	128,000	151,000	156,000
Russian Federation		18,000		192,000	210,000	210,000
South Africa		1,464	7,914	4,220	13,598	13,598
Spain		233,635		317,180	550,815	550,815
Switzerland		493,300		49,000	542,300	542,300
UK	17,925	698,363	631,930	237,214	1,567,507	1,585,432
USA		400,000	860,000	740,000	2,000,000	2,000,000
<b>Total</b>	<b>213,396</b>	<b>2,118,202</b>	<b>3,074,408</b>	<b>3,166,979</b>	<b>8,359,589</b>	<b>8,572,985</b>

\* The data is based on the information provided by donor Members, as of 28 April 2005.

## ANNEX IV

### Evolution of Members' contributions to VCP(ES) and VCP(F) 1985-2004



## ANNEX V

### **Statistics related to the support received for VCP projects circulated amongst donors during the period 1988-2003 and in 2004**

(VCP requests related to fellowships excluded)

Fields of co-operation	Number of projects having received support during 1988-2003	Total number of projects having been circulated during 1988-2003	Percentage of projects having received support during 1988-2003	Number of projects having received support in 2004	Total number of projects having been circulated in 2004	Percentage of projects having received support during 1988-2004
Surface observing stations	82	173	47%	2	2	48%
Upper-air observing stations	158	292	54%	8	15	54%
Satellite receiving stations	38	99	38%	1	6	37%
Weather radar stations	4	18	22%	0	0	22%
Telecommunication systems	172	333	52%	8	5	53%
Data processing systems	37	87	43%	2	4	43%
Maintenance workshops	6	21	29%	0	0	29%
Research and training centre activities	6	24	25%	0	0	25%
CDMS and climatological activities	87	156	56%	1	8	54%
Hydrological activities	27	78	35%	2	4	35%
GAW and environment protection activities	4	57	7%	0	0	7%
Meteorological applications activities	96	154	62%	2	5	62%
Total	717	1492	48%	26	49	48%

## ANNEX VI

### Agreed New VCP Evaluation Form

#### Evaluation Report on a VCP project (Full Report Form)

##### Introduction

In accordance with the Rules of the VCP, the recipient countries shall provide WMO, periodically during the five-year period following completion of the implementation of each VCP project, with a written report on the operation of the VCP project. The objective of the report is to evaluate the effectiveness of the VCP projects on the manner in which the outcomes (expected services or the results) from the project were available for the implementation/operation of the relevant WMO Programme(s); the report should also show the reasons why expected services or results have not been available, and possible action which could be undertaken to strengthen the project further, as well as to improve planning and implementation of new projects.

The recipient countries are therefore invited to complete the following Tables 1 to 6 for each relevant VCP project as applicable.

##### Definitions

The outcomes (expected services or results) from the project for the benefit of the implementation/operation of the relevant WMO Programme(s) are to be defined in Table 2; for example, for a project under which upper-air observing equipment was installed, the services or results expected from the project would be "two TEMP reports a day".

The date of the completion of the implementation of the project should be understood as the start date of operation of the equipment/services provided.

The life span of the project should be understood as the time between the date of completion of the implementation of the project and the date of preparation of the evaluation report.

**Table 1 – Basic project information**

Recipient country:		Donor country:	
Project area/field:		Type of support (Full or Partial):	
Project indicator and title:			
Date of completion of the project (Start date of the operation of equipment/services):			

**Table 2 – Summary of outcomes**

Outcomes (expected services or results (see above definitions)) from the project:		
During the life span of the project (see above definitions), percentage of the time during which the services or results expected from the project were available:		%
During the three months preceding the date of preparation of the evaluation report, percentage of the time during which the services or results expected from the project were available:		%

<b>Report Date:</b>	
---------------------	--

<b>Project focal point:</b>	
-----------------------------	--





**Table 4 – Reasons for possible unavailability of services or desired results, if applicable**

Reasons why the services or results expected from the project could not be made available during the present life span of the project (as applicable)	
1. Reasons directly linked to the implementation of the project (as applicable):	Reply Yes/No with further details of the possible reasons
Equipment unsatisfactorily installed	
Inadequate equipment (hardware, software, documentation, consumables, etc.)	
Insufficient training	
Lack of spare parts	
Other reasons to be specified	
2. Reasons not directly linked to the implementation of the project (as applicable):	Reply Yes/No with further details of the possible reasons
Breakdown of the equipment delivered under the project after the installation (see Note 1)	
Other set of equipment (not delivered under the project) not in operation and affecting the services or results expected from the project	
Lack of ongoing consumables (consumables not included in the project)	
Lack of operators	
Other reasons to be specified (e.g., problems associated with telecommunications and power supply)	

Note 1: Information on the arrangements made by the recipient country for the maintenance of the equipment during the life span of the project (maintenance contract with the manufacturer, maintenance made directly by the recipient country, etc.) should be provided together with information on the difficulties experienced.

**Table 5 – Possible action to be undertaken to further improve the effectiveness of the project**

1. Action planned to be undertaken directly by the recipient country (within its own resources, under bilateral assistance, etc.):	
2. Assistance required (see Note 2) by the recipient country for:	
Provision of additional equipment (hardware, software, spare parts, consumables, etc.):	
Provision of additional training:	
Provision of expert services to assist the recipient country:	
Other type of assistance required:	

**Table 6 – Follow-up activities or projects for sustainability**

Information on any recommended follow-up projects (e.g., further Phase) for sustainability:

Note 2: As necessary, request(s) for required assistance (e.g., under the VCP) should be sent separately to the WMO Secretariat.

## ANNEX VII

### *ACTIVITIES OF VCP CO-ORDINATED PROGRAMMES IN 2004*

#### **1. Improvement of the global network of observing stations with special emphasis on GCOS upper-air network and HYCOS stations**

1.1 Following the recommendations given by EC, CBS and CIMO, Members concerned together with the Secretariat had accomplished a number of VCP projects aimed at upgrading surface and upper-air stations, including GUAN and GSN. In particular, during 2004, four upper-air stations have been put in full operational mode in Armenia, Maldives, Mauritius and Vanuatu through provision of sounding systems, spare parts and essential consumables. Four VCP projects had been completed in Kiribati, Malawi, Russian Federation and Serbia and Montenegro, to secure sustainable functioning of their synoptic stations. The above projects were supported through full or partial contributions provided by Japan, the Netherlands, USA and VCP(F). It should also be mentioned that there are 19 on-going VCP projects related to rehabilitation and upgrading of upper-air observing networks in Argentina (2), Armenia, Cameroon, Colombia, Cook Islands, Costa Rica, Cote d'Ivoire, Cuba, Democratic People's Republic of Korea, Dominican Republic, Ecuador, Jamaica, Kenya, Mauritania, Mongolia, Mozambique, Netherlands Antilles and Aruba and Papua New Guinea. Implementation of projects in these countries has been supported through generous contributions provided by Australia, China, UK and USA. It should be noted that out of the above 19 projects, nine projects were initiated in 2003-2004 in direct support of the refurbishment and/or operation of GUAN stations. Funded by USA, these projects include the purchase of needed equipment (sounding systems, hydrogen generators) and essential consumables such as radiosondes and balloons, where appropriate. There are seven on-going VCP projects in Albania, Guinea Bissau, Madagascar, Sao Tome and Principe, Sierra Leone, Swaziland and Ukraine related to rehabilitation and upgrading of surface stations. The donor's support for these projects has been provided by China, Egypt, France and Japan. Overall, there are 41 and 42 outstanding projects related to surface and upper-air observing stations respectively, where VCP assistance has been requested (see Doc. 4(3)).

1.2 In the implementation of GUAN station upgrades, emphasis has been placed on solutions that may result in lower operating costs in the future. GPS-based radiosondes are a rather expensive option for developing countries. Currently these radiosondes cost more than US \$200. In most parts of Africa, radiotheodolite direction finding (RDF) radiosondes would perform well and cost less than US \$100. Modern radiotheodolite systems are much easier to operate and maintain as it was in the past. The recently installed Integrated Upper Air System (IMS-1600) at Dar es Salaam was used in an operational demonstration to confirm that the RDF mode of operation is appropriate. This radiotheodolite system should also be able to track radiosonde from multiple manufacturers. To fly multiple sondes from competing manufacturers would allow operators to purchase consumables through competitive auctions.

1.3 Vaisala Oyj had informed of the transition to a new family of RS92 radiosondes. The RS92 radiosondes provide technological advancements, such as improved (digital) telemetry, better slant range, more reliable data link and narrow band option that will result in a higher level of PTU performance and continuous wind data availability.

1.4 According to the Vaisala Transition Plan, the production of the RS80/90 series of radiosondes will be discontinued in the course of 2005, which will necessitate upgrades of currently used ground stations to be compatible with RS92 sondes, or their total replacement in case of some older systems, such as CORA (1973), MicroCORA (1981) and PC-CORA (1990), as no upgrade options would be made available.

1.5 Based on the WMO Radiosonde Catalogue, Vaisala RS80 radiosondes are at present used at about 447 and RS90 at about 78 upper-air stations, that represents 45 and 7.8 per cent, respectively, of the upper-air stations worldwide. Of those stations more than 80 ground stations would need to be replaced and the rest would need different levels of upgrades. This significant change in the use of RS80/90 is, therefore, of great concern to WMO and its Members. It should be noted that individual transition plans in collaboration with affected customers had been developed, which should allow customers to plan their activities and actions well in advance.

1.6 The above action of a leading radiosonde manufacturer would require funds over and above the already costly operation of the network of upper-air stations, and therefore creates serious concern over the possible weakening of the worldwide network, because numerous stations would most likely not be timely upgraded or replaced due to lack of funds. It is suggested as a matter of urgency to investigate the impact of this development on the upper-air network and to initiate action towards alleviating the risk of a prolonged loss of upper-air data, especially in developing countries.

## **2. Improvement of the telecommunication systems, including common carrier technologies and the use of Internet technology, specifically for transmission of satellite data**

2.1 The implementation of cost-effective PC-based systems for GTS/GDPS functions in WWW centres, including developing countries, continued to make progress. Significant progress was also made in the implementation of Regional Meteorological Telecommunications Networks (RMTNs), but serious shortcomings still exist in some Regions at the regional and national levels.

2.2 In all Regions, importance is given to National Meteorological Telecommunication Networks (NMTNs) for the collection of observational data at national level. The general strategy for implementing NMTNs is the use of public/commercial telecommunication services (*e.g.*, Public Data Networks, Public Switched Telephone Networks, GSM cellular networks, VSAT networks, etc.), which are generally cost-effective and efficient in areas where the public telecommunication infrastructure is available. Digital radio-telecommunication systems, Data Collection Platforms (DCPs) are appropriate where the public infrastructure is not available, *e.g.*, in remote areas, depending on the national or sub-national conditions.

2.3 In Region I, despite serious economic difficulties, continuous efforts from NMHSs enabled some improvement of GTS circuits via leased lines, satellite-based telecommunications or public data networks, including the Internet. There are still serious shortcomings, in particular for data-collection at the national level, and a number of NMCs have no GTS link, or a low-speed circuit. The RA I strategy for enhancing WWW basic systems was developed to enable sustainable development, in particular of meteorological data communications, but actual implementation planning was relying upon resource mobilization. Satellite-based data-distribution systems and data-collection systems play a crucial role. In this regard, the DVB-S system EUMETCast, now associated with the PUMA project (funded by the European Commission) for the implementation of MSG receiving stations, and the RETIM Africa, are essential contributions to the strategy for the upgrade of reception of data and products at WWW centres of the Region. The implementation of the PUMA project was being deployed in 2004/2005 (see Appendix I). RETIM-Africa stations were installed, in particular at Indian Ocean centres, and further implementation is planned. The RANET system (RAdio and interNET system for transmission of hydrometeorological data) via the WorldSpace Afristar satellite is also an important tool for the distribution of meteorological information to end-users in Africa. General telecommunication services are in fast development including the Internet, but still at costs difficult to afford by several NMHSs.

2.4 The implementation of GTS circuits in Region II had made very significant progress, through the IMTN plan for MTN circuits and the upgrade of a number of regional circuits to Frame Relay circuits in the South-Eastern part, to 64 kbit/s digital leased circuits, in particular in the area of responsibility of RTH Jeddah and to V.34 (19.2-33.6 kbit/s) leased circuits, in the Northern part. However, five NMCs have no GTS connection and four NMCs were only connected at low speed. XIII-RA II agreed upon a development plan for 2005-2007. The Region is covered by several satellite-based data-distribution systems that play an important role, in particular for exchanging processed data, and advanced techniques were being used and introduced (VSAT, DVB and DAB). A pilot project on Virtual Private Network (VPN) was developed in the framework of the future WMO Information System (WIS), in collaboration between volunteering RA II and RA V NMHSs.

2.5 In Region III, the actual implementation of the RA III RMDCN project is expected to start soon, after the signature in December 2003 by the Secretary-General of the umbrella RMDCN contract with EQUANT, the network services provider selected through an international call for tender. Important efforts were already made for adequate GTS connections, including MTN links, for the three RTHs. All 13 NMCs are also equipped with systems receiving WAFS, OPMET and meteorological information via the International Satellite Communication System (ISCS) operated by the USA. The 2004 upgraded ISCS, which operates with IP procedures, needs the urgent installation of new PC-based workstations to ensure continued operation and services.

2.6 The two-way satellite-based network RMTN of Region IV that was integrated in the ISCS, operated by the USA, was upgraded with IP procedures and an increased capacity. The upgrade required the modernization of the related NMC workstations, which was supported under international cooperation projects (SIDS from Finland and VCP from USA). WMC/RTH Washington also provides complementary/back-up services for collecting observational reports and access to data and products via the Internet.

2.7 In Region V, significant progress has been achieved in the RMTN with the implementation of the IMTN plan for MTN circuits, upgrade of most of the regional circuits as Frame Relay circuits in the Western part, and improvements in the Pacific, including the implementation of inter-regional link Nadi-Washington and use of the Internet for the data-collection and linking several small island countries. There is an increased usage of satellite-based communications systems, including the GTS component of the ISCS over the Pacific, the Data Collection System (DCS) and the Emergency Managers Weather Information Network (EMWIN). In this respect, the EMWIN receivers that are a crucial source of data, warnings and forecasts for Pacific small island countries, should be replaced to match the new technical specifications planned for 2007.

2.8 The RMDCN inter-connects thirty-five countries, ECMWF and EUMETSAT, and is a successful achievement of the WWW Programme in Region VI, with a very high reliability, full security, easy scalability and an increased cost-effectiveness. Several MTN circuits linking RTHs in Region VI to other RTHs in Region II were implemented through an extension of the RMDCN. A plan had been developed to migrate the RMDCN technology to a more advanced technology during 2005. The other RA VI Members are operating leased point-to-point GTS circuits and are expected to join the RMDCN as soon as possible. The point-to-point circuits are complemented by satellite data distribution systems based on DVB-S advanced digital techniques (DWDSAT associated with EUMETCast, RETIM2000, TV-Info-meteo). A co-ordinated project for the automation of NMCs Kishinev, Tbilisi and Yerevan was developed with the assistance of France and Russian Federation and was under implementation.

#### Support to Internet capabilities at NMHSs

2.9 CBS recognized that, for several small NMHSs, the Internet was the only affordable telecommunication means for transmitting meteorological information, despite its possible shortcomings

(availability, reliability, security). It developed and kept updated guidelines on technical arrangements for e-mail, FTP and connections, with a view to minimizing operational and security risks. The support for implementation of Internet capabilities at NMHSs is frequently associated with the initial automation of NMCs. Internet access facilitates the involvement of NMHSs in WMO activities, in particular WWW, and NMHSs of developing countries are benefiting from the VCP support for accessing to the Internet through relatively low-cost equipment, at least for e-mail services.

### **3. Improvement of the performance of NMCs**

3.1 The implementation in several NMCs and some RTHs of PC-based GTS/GDPFS systems using off-the-shelf hardware and software components to a large extent, which are available from several manufacturers, confirms the considerable benefits from adopting standard data-communication and data-management techniques, protocols and application for WWW operation. These benefits equated to direct savings in financial and human resource to Members by reduced costs for communication equipment purchase and maintenance.

### **4. Support to the Tropical Cyclone Programme (TCP)**

4.1 The Tropical Cyclone Programme's (TCP) main objective is centred in promoting the establishment of national and regionally co-ordinated systems to ensure that the loss of life and damage caused by tropical cyclones are reduced to a minimum. In pursuit of this, the TCP had in 2004 made special efforts to strengthen and improve the capabilities of NMHSs in the provision of improved tropical cyclone forecasts and effective warnings. Foremost among these are efforts in capacity building by providing assistance in the attachment of forecasters at the different Regional Specialized Meteorological Centres during the cyclone season, attachment of storm surge experts at the Indian Institute of Technology in Kharagpur, and the conduct of refresher training courses to operational forecasters on tropical cyclone forecasting and warning such as the Workshop on Hurricane Forecasting and Warning which was held at the RSMC Miami-Hurricane Center from 13 to 24 April 2004.

4.2 The programme in 2004 continued to encourage Members of the five tropical cyclone regional bodies to think more strategically and to share best warning practices between them that would be of assistance in their efforts to capitalize on growing research and development opportunities. In this respect, the TCP organized the Second Regional Technical Conference on Tropical Cyclones, Storm Surges and Floods (Brisbane, 1-3 July); co-sponsored the International Conference on Storms (Brisbane, 5-9 July); and provided assistance in organizing the Meeting of the Working Group on the Review of the Operations and Structure of the Typhoon Committee (Bangkok, 20-22 April), Workshop on Living with Risk: Dealing with Typhoon-related Disasters as part of Integrated Water Resources Management (Seoul, 20-24 September) and the series of roving lecture seminars on tropical cyclones arranged by the Committee's Typhoon Research Co-ordinating Group in Beijing from 20 to 24 November and Kuala Lumpur from 25 to 27 November.

4.3 In keeping with the scheme not to limit the technology information exchange services to electronic data accessible only through the Internet, the TCP had made available training materials and reports in CD-ROM which were distributed to Members.

## 5. Support to public weather services (PWS) activities

5.1 Several Members sought and received assistance through the VCP in developing their national public weather services programmes, particularly in the area of presentation and dissemination of meteorological forecasts, warnings and information. The requests for VCP support and assistance were mainly for the following:

- Provision of equipment to facilitate the design and dissemination of forecasts and warnings by meteorologists to the public; and
- Provision of the relevant training to NMHS staff in the use and maintenance of the equipment to support enhanced quality services.

### *Projects approved for circulation that have had no offer of support*

5.2 During 2004, the Democratic People's Republic of Korea requested assistance for the provision of a TV weather presentation system to upgrade its public weather services efforts. Currently there are listed requests for assistance in acquiring television/media presentation systems from five Members (with year of circulation in brackets) as follows: Bosnia and Herzegovina (2003), Georgia (2002), Lao PDR (1998), Niger (2002), and Zimbabwe twice, (2000, apparently repeated in 2001 with request for a TV studio and a training component added).

5.3 The United Republic of Tanzania requested assistance (circulated in 2000) in replacing non-Y2K compliant computers for their TV weather presentation studio and Kenya sought assistance (circulated in 2001) in acquiring a non-linear video-editing system for their TV weather presentation studio. No support has been given to these projects.

### *Projects that have received partial support but are still valid for 2004*

5.4 The request by Uganda for support in acquiring meteorological instruments and a weather presentation facility for popularizing meteorology in schools received partial support from the USA, with the donation of US \$18,000 for Phase 1 of the project. The outstanding request is for basic meteorological instruments for 10 schools and a weather presentation facility for the NMC.

### *Projects receiving full support and are either completed or on-going*

5.5 Following the provision of simplified TV/media presentation systems to countries in Africa, UK is funding an upgrade to the TV system at Bamako, Mali with training. Burkina Faso, Democratic Republic of the Congo and Guinea will participate in the four-week workshop planned for March 2005 and receive an upgrade kit to be shipped to each country.

## 6. Support to climate data management and CLIPS

### *Climate Data Management Systems (CDMSs)*

6.1 The migration to the new CDMSs is continuing in most regions. In many countries, CLICOM has stopped working due to the change of operating system (migration from Windows 95/98 to Windows 2000, or Windows XP).

6.2 Countries in eastern Europe (Armenia, Belarus, Georgia, Kazakstan, Republic of Moldova, Tajikistan, Turkmenistan and Ukraine) have requested primarily CLIWARE to replace CLICOM, along

with a Data Rescue project to preserve the climate records as digital image archives. CLIDATA, CLIMSOFT and CLISYS are requested in Africa and Asia. Syria has installed JCDMS developed by Jordan.

#### Data Rescue (DARE)

6.3 With the support of Belgium, more than 20 countries in Region I were equipped with PCs and digital cameras. Following the support of the US to Viet Nam, 18 CDs containing images of the climatological records of Viet Nam were sent to NCDC in January 2005 to be keyed-in in a MS-Access database. The African Upper-Air Data Rescue project continues in seven countries in Africa. It should however be noted that the countries are still waiting to receive their keyed data in a usable form. They also recommend that the project take into account surface data.

#### Climate Information and Prediction Services (CLIPS)

6.4 In 1999, VCP assisted in funding a CLIPS Showcase Heat Watch/Warning System in Shanghai, China. A second showcase project took place in Rome, Italy, in 2000. These projects revealed that Heat/health Warning Systems are important tools for parts of the world which are vulnerable to deadly heat waves, and that it is vital for the meteorological and health communities to work together to issue appropriate information and warnings, and to develop and implement mitigation measures for saving lives and reducing burdens on society.

6.5 WMO is now planning development of Guidelines on Heat/health Warning Systems so that any country which is vulnerable to deadly heat waves will have information and advice, including some software, for implementation of a Heat/health Warning System. WMO is working with WHO to jointly publish these Guidelines, and there will likely be a strong need within regions for joint WMO/WHO workshops to build local capacity in the techniques, and to facilitate the relationships needed for applying the warnings effectively into reducing mortality. VCP donors could help considerably in setting up these capacity-building workshops.

### **7. Support to training and human resources development for meteorology and operational hydrology**

7.1 One of the major VCP activities supporting training and human resources development in meteorology and operational hydrology is the award of short- and long-term fellowships. During the year 2004, a total of 76.7 person x month of fellowships of different duration were awarded to fellows under the VCP while 327.5 person x month were jointly funded under RB and VCP. Therefore, the VCP continued to be one of the major sources in supporting WMO fellowships (refer to IPM/VCP/TCO(2005)/Doc. 3, paragraphs 1.3.1-1.3.3).

### **8. Support to ACMAD activities**

8.1 In 2004, in conformity with the work plan adopted during the last ACMAD board of Governors, and within the financial support of France, Italy, the Netherlands, Spain, UK, USA and UNDP, as well as the VCP(F), the activities of ACMAD were mainly in the following five main areas:

- (a) Institutional reinforcement of ACMAD;

During 2004, significant progress was made in the revision of the centre's statutes, which revision was necessary to conform with decisions relating to the rationalization and harmonization



process of institutions under the auspices of the ECA. The revision was completed;

- (b) Consolidation of partnerships between the ACMAD Centre, the NMSs, specialized sub-regional and regional institutions by several missions on resource mobilization and scientific contributions;
- (c) Capacity building in the African NMSs:
  - Regional fora of seasonal forecast and its applications for the benefit of the socio-economic development and welfare of the population;
  - Training sessions for capacity building in the field of climate prediction for climatologists, hydrologists and other users from food security and water resource management sectors.

Incitation of research in the member States was sustained. Ten new projects were identified for funding, and the 16 projects selected by the Scientific Advisory Committee in 2003 continued to be pursued. The second capacity-building workshop for Directors of NMSs, ARCADIA-02, on resource mobilization and strategic plan design and implementation was held in Nairobi, Kenya. The on-the-job training was reorganized into modules. The following modules are offered: Numerical weather prediction, Climatology, New information and communication technologies;

- (d) Improvement of NMSs' visibility to end users of meteorological products and to partners, through contact visits and on-line information dissemination;
  - (e) Exploration of new opportunities for opening new perspectives for the benefit of African NMSs and the international meteorological community.
-

**ANNEX VIII**

**Status of WWW Implementation Support Revolving Fund from 1997 to 2004**

(in US \$)

as at 31/12/2004

Recipient Country	Items purchased	Total Purchase Cost plus 14% Support Cost	Amount reimbursed	*Balance to be reimbursed	24 Months Grace Period expired on	Latest reminders sent on
* <b>Ecuador</b>	Spare parts for met. instruments	9,101	0	<b>9,101</b>	30/04/95	22/05/02
Egypt	Charts for anemograph	11,052	11,052	0	13/03/00	25/11/99
Egypt	Recording charts for anemograph	7,870	0	7,870	04/08/06	-
Ghana	Spare parts for met. Instruments, etc.	7,899	7,899	0	30/11/91	29/11/99
* <b>Guinea-Bissau</b>	Surface measurement instruments	10,091	0	<b>10,091</b>	28/02/89	15/05/02
Kenya	Spare parts for Murihead transceiver	8,800	8,800	0	30/06/95	10/01/97
Lesotho	PC peripherals for satellite receiver	12,138	12,138	0	31/05/97	-
Malawi	Meteorological Station Consumables	8,026	8,026	0	15/04/01	16/02/01
Mozambique	Spare parts for HARRIS RF201	11,073	11,073	0	31/07/89	29/11/99
Seychelles	Radiosondes etc.	8,898	8,898	0	31/01/97	-
Tanzania, U.R. of	Spare parts for transmitter/receiver	3,116	3,116	0	31/07/90	19/02/01
* <b>Uganda</b>	Spare parts for met. instruments	9,432	6,754	<b>2,678</b>	30/11/95	15/05/02
* <b>Zambia</b>	300 g balloons	1,531	297	<b>1,234</b>	30/04/96	15/02/02
<b>Total</b>		<b>109,027</b>	<b>78,053</b>	<b>30,974</b>		

\* Countries not having reimbursed after 24-month period

**WWW Implementation Support Revolving Fund  
Financial Statement as at 31/12/2004**

(US \$)

Cash at bank	94,026
Accounts receivable	30,974
<b>Total</b>	<b>125,000</b>

## ANNEX IX

### List of on-going projects

<b>Technical Cooperation Projects - ONGOING PROJECTS -</b>		
<b>Country/Region</b>	<b>Project Indicator</b>	<b>Project Title</b>
<b>Global</b>		
<b>Global UNDP</b>		
Global	GLO/02/G3 (2002-2005)	Capacity Building for observing systems for climate change
<b>Eastern and Southern Africa (ESA)</b>		
<b>ESA Trust Fund</b>		
<a href="#">Eastern Africa</a>	<a href="#">USAID/DMCN/OFDA (2002-2006)</a>	<a href="#">Regional Climate forecasting for the Greater Horn of Africa</a>
Eastern Africa	USAID/REDSO DMC FIT (2002-2006)	Climate Monitoring, Prediction and Disaster Preparedness
IGAD	IGAD-HYCOS	IGAD Hydrological Observing System (IGAD-HYCOS)
SADC	SADC-HYCOS	SADC Hydrological Observing System (SADC-HYCOS)
SADC	WMO/IRI/SADC (2002-2005)	Mitigating the effects of hydro-climatic extremes in Southern Africa
Kenya	KEN/USAID/FIT (2001/2005)	Improving meteorological observations through utilization of HAM radio operators in Kenya
<b>Central and Western Africa (CWA)</b>		
<b>CWA Trust Fund</b>		
Chad	CHD/FIT/SUISSE	Application of agrometeorological information and advice to agricultural production in Chad
Mali	MLI/FIT/SUISSE	Extension of the operational meteorological assistance to the rural communities in Mali
CILSS	SVS/FIT/ITA	<a href="#">Vulnerability Assessment in Sahel (SVS)</a>
<b>Arab States, Asia and Pacific (AAP)</b>		
<b>AAP UNDP</b>		
<a href="#">Maldives</a>	<a href="#">MDV/98/001</a>	<a href="#">Human Resources Development in Meteorology of Maldives</a>
United Arab Emirates	UAE/02/001	Strengthening of Meteorological Services of the UAE Armed Forces
United Arab Emirates	UAE/02/003	Establishment and Operation of National Network for Weather Radars and Automatic Weather Observing Stations
Libyan Arab Jamahiriya	LIB/2000/003	Modernizing and Upgrading the Meteorological Services of Libyan Arab Jamahiriya
Libyan Arab Jamahiriya	LIB/02/002	Strengthening cloud seeding research in Libya

## ANNEX IX, p.2

### List of on-going projects

<b>Technical Cooperation Projects - ONGOING PROJECTS -</b>		
<b>Country/Region</b>	<b>Project Indicator</b>	<b>Project Title</b>
<b>AAP Trust Fund</b>		
<a href="#">Iran</a>	<a href="#">WMO/IRIMO/FIT</a>	<a href="#">Establishment of Weather Radar Network</a>
Oman	OMAN/WMO/FIT-2002	Data Collection and Processing Systems and Related Training
Saudi Arabia	NOAA/WMO/ARSAD	Implementation of Technical Assistance Projects
ASEAN countries	ESCAP/WMO/ASEAN HAZE	Support to the Implementation of the Regional Haze Action Plan of ASEAN Member Countries
<b>Europe and Newly Independent States (ENI)</b>		
<b>ENI Trust Fund</b>		
Czech Republic	Czech Republic (training)	Assistance in Meteorology, Hydrology and Air Pollution in developing countries
<b>Northern and Central American Countries (NCAC)</b>		
<b>NCAC Trust Fund</b>		
<a href="#">Mexico</a>	<a href="#">Mexico PROMMA (1997-2003)</a>	<a href="#">Water resources management project in Mexico</a>
Caribbean Small Island Developing States	SIDS-CARIBBEAN (2000-2004)	Preparedness to Climate Variability and Global Change in Small Island Developing States of the Caribbean Region (SIDS-CARIBBEAN)
Dominican Republic	SNAMET (2001-2003)	Establishment of a Meteorological Early Warning System for Dominican Republic
<b>South America</b>		
<b>South America Trust Fund</b>		
<a href="#">Brazil</a>	<a href="#">WMO/ANEEL (98-001)</a>	<a href="#">Monitoring Program and Hydrological Georeference for Energetical Purposes</a>
Brazil	WMO/ANA/02/001	Program of Technological Update of the Hydrological Monitoring and Georeferenced Systems and Technical Training for Water Resources Management
Brazil	WMO/IBAMA (03-002)	Environment Quality
Brazil	WMO/INMET (02-002)	Technological Modernization of the National Institute of Meteorology
Ecuador	ECU/FIT/IRCEN	Establishment, Operation and Development of the International Research Center for the El Niño Phenomenon in Guayaquil

## ANNEX X

### HIGHLIGHTS OF OTHER ON-GOING PROJECTS

#### *Replacement of current meteorological satellite ground receiving systems in NMHSs in Africa*

1.1 The Task Team on the Preparation for the Use of Meteosat Second Generation (MSG) in Africa (PUMA), since its establishment in 1996, has developed project proposals for the supply and installation of the new equipment in the five sub-regions, namely, IOC (Indian Ocean Commission), IGAD (Inter Governmental Authority on Development), ECOWAS, (Economic Community of Western African States), SADC (Southern African Development Community) and CEMAC (Communaute Economique et Monetaire de l' Afrique Centrale). The project proposals were submitted to the European Commission (EC) for funding, and EC has agreed to cover the project cost of about €11 million for the period 2001-2005. This will allow each country to receive:

- (a) equipment to assure continuous direct reception of the new data stream from MSG;
- (b) software to operate the equipment and derive usable products (like weather forecasts, estimates of rainfall, real-time observation of fires or sea-surface temperature); and
- (c) training in making better use of data.

These actions will improve the ability of NMSs to work in closer partnership with the broader community of users, through the support for useful new products.

1.2 The Project Steering Committee which is regularly meeting on a twice-yearly basis held its last meeting in Nairobi in June 2004. In the meeting, an assessment of the performance of the Project and recommendations on the way forward were made. Some of the issues that were discussed include: Activities of the Project Management Unit (PMU); PMU Work Programme; and Training and Outlook Activities Programme.

1.3 The project is currently under implementation. After having been frozen in early 2003 to cope with the change of the MSG data dissemination method from Direct Broadcasting to DVB, ALCATEL resumed its activity on the basis of a new baseline. The Factory Acceptance Test (FAT) of the stations took place at the end of November 2003 and was successful. Following the FAT, the antenna deployment began with a test period. At the end of 2004, the antennas have been installed at 11 stations: Kenya, Niger, Senegal (two stations), Zimbabwe, Cameroon, Mauritius, Congo, Mali, United Republic of Tanzania and Mauritania. In anticipation of the shipment of MSG equipment, the Heads of the NMHSs were requested to liaise with the relevant authorities in their countries to facilitate fast clearance at the ports of arrival. In parallel, an important training programme has been initiated in March 2004 which will cover 17 training courses of three weeks each, gathering more than 350 participants.

1.4 In the PUMA project, it is also planned to develop some software enabling the NMSs to process MSG data. According to the recent development and the possibility to buy very cheap software packages to receive and handle EUMETCast data, the PUMA Task Team is supporting the idea that a "low cost" receiving station should be developed, enabling access to MSG data in more than one site per country. Such a low cost station will not have all the functionalities of the "PUMA" receiving stations, but due to their limited cost (estimated at a few thousands dollars), they could be used to multiply the number of points of access to MSG data in Africa. This project will also be considered by the Task Team.

1.5 The project schedule is as follows:

- Mobilization of the PMU (October 2001);
- Release of HW & SW (November 2001);
- Signature of industrial contract with industry for HW and SW provision and technical training (August 2002);
- MSG launch (August 2002);
- Presentation of the technical solution and global discussion on the project with all African stakeholders at the 5th EUMETSAT User Forum in Africa (October 2002);
- Installation of test stations in Africa (January - September 2004);
- Installation of remaining stations in Africa (September 2004 - August 2005);
- 6th EUMETSAT User Forum (Brazzaville) (September 2004);
- Training and Outlook Activities (February 2003 - June 2005);
- End of the project (September 2005).

1.6 As a result of the EUMETCast system enabling transmission of non-meteorological data and a call for ideas in February 2003 under the outlook activities component of the PUMA project, the following six pilot projects aiming at nurturing partnerships and networking in support of long-term development efforts in Africa received funding:

- AGRHYMET (Niger): upgrading of a network for continuous management of desertification in West Africa, to enable MSG data use;
- KEMFRI (Kenya): use of data from MSG and other satellite sources in a tuna population-tracking programme, for fishing purposes;
- LERG (Senegal): use of MSG data in combination with other data to improve environment and food chain management, in the Exclusive Economic Zone of Senegal;
- METTELSAT Project (Democratic Republic of the Congo): use of MSG data to evaluate water resources of the Kasai river basin;
- MWI Project (Kenya): natural resources degradation control by using satellite remote sensing techniques;
- SAWS Project (South Africa): development of a MSG data users' network in southern Africa.

1.7 In anticipation of the end of the project, the PUMA Task Team has started discussions on the long-term maintenance of the receiving stations. The current contract with ALCATEL includes maintenance until September 2006. After that date, the NMSs in Africa will have to take care of the maintenance of their stations. The PUMA Task Team will review this item in the course of 2004 and come up with a proposal by early 2005.

1.8 Since the approved project does not cover countries of the Mediterranean basin (Algeria, Egypt, Libyan Arab Jamahiriya, Morocco and Tunisia) and South Africa, other alternatives for funding were/are being explored, in particular from bilateral arrangements, trust funds and the VCP. In this connection, a Trust Fund was established in July 2001 within the WMO Secretariat to facilitate the purchase of MSG receiving equipment and training by the above countries. Tunisia has deposited into the Fund US \$100,000 to enable WMO to purchase the equipment on its behalf. Procurement of the equipment is at an advanced stage. France has committed €152,000 to the Trust Fund. The UK has agreed to support the training of the participants of these six countries as well as the establishment of training centres (MSG colleges) in Morocco and South Africa. The UK contribution to the project amounts to €450,000 and has been channelled directly through the project.

### **Radar project for CARICOM countries**

2.1 The Caribbean Radar Network Project was first developed for the Caribbean Meteorological Organization (CMO) with the help of the WMO. In October 2003, the European Commission approved a €13.2 million Regional Project to construct and install four new digital weather radars in the Caribbean to replace an old and obsolete radar network installed by the CMO in the late sixties and early seventies. The Project will link the new radars with others already in place to form a modern network of nine radars as part of the Caribbean Early Warning System for severe weather conditions.

2.2 The Caribbean Forum of ACP States (CARIFORUM) in Guyana has overall responsibility for the Project, using resources of the 9th European Development Fund (EDF), while the CMO, based in Trinidad and Tobago, is the Executing Agency.

2.3 The following is a summary of the features of the Project [*Official title: Regional Weather Radar Warning System*] and an indication of ongoing and expected activities, primarily in the coming year.

2.4 The Radar Project will feature:

- (i) Four new Doppler digital radars in *Barbados, Belize, Guyana and Trinidad and Tobago*, which will provide continuous real-time radar coverage out to 400 kilometres from each site and which will enable the National Meteorological Services (NMSs) to provide images and guidance to the public and key local sectors, such as the aviation industry, the water resources sector, agriculture and disaster preparedness officials; and
- (ii) The creation, in collaboration with Météo-France, of a regional radar network comprising these four radars, plus existing radars in *Jamaica, Dominican Republic, Guadeloupe, Martinique, and French Guiana*. This regional network will provide an electronic composite of all the radars, thereby providing broad areal coverage of the Caribbean islands. Operational composite radar images or individual radar images would be available at the WMO RSMC (US National Hurricane Center) in Miami. The CMO has initiated discussions towards the installation of a radar in the Cayman Islands, but not as part of this Project.

2.5 The configuration of the network is shown in Figure 1.

2.6 Since the 2004 IPM/VCP, the following activities have taken place:

(1) The Project Proposals had been submitted to the European Commission in 2003 under the 8th EDF. However, the European Commission decided that the funding would be from the 9th EDF funds to become effective from 2004. The Financing Agreement for the Project was therefore signed by the European Commission and CARIFORUM under 9th EDF rules. Since that time, and mostly since the 2004 IPM/VCP, the main formal actions completed were:

- A Memorandum of Understanding between the CMO and CARIFORUM for the Project Implementation;
- Separate Memoranda of Understanding, for the ownership and operation of the radars, were signed between :
  - CARIFORUM and the Government of Guyana
  - CARIFORUM and the Government of Belize

- CARIFORUM and the Government of Barbados and
  - CARIFORUM and the Government of Trinidad and Tobago
- 
- Preliminary site preparations, in accordance with the MoU, were started in Trinidad and Tobago;
  - A Deputy Regional Authorizing Officer (DRAO) was named by the Trinidad and Tobago Government, at the request of the Secretary-General of CARIFORUM, who is the Regional Authorizing Officer (RAO).

(2) Since the European Commission decided that the Project would be funded under the 9th EDF and not the 8th, a new contract was given to the Consultancy Firm SEMA/Eurostrategies from Europe to assist the CMO in transforming all implementation documents to conform to the 9th EDF procedures. Although very necessary, this in itself has been the source of delays, because the 9th EDF procedures and formats were not totally available in printed or electronic form until July-August 2004, so that EU field offices and implementing agencies had to wait until that time to finalize tendering documents. The Consultancy was therefore split into several parts stretching through 2004.

2.7 The implementation of the Regional Weather Radar Warning System Project is under the supervision of a high-level Steering Committee from the European Commission (Funding Agency), CARIFORUM (Contracting Authority) and the CMO (Implementing Agency). A Regional Coordination Unit, which will include the four relevant NMSs, will coordinate the technical aspects of the Project, while the overall management of the Project will be carried out in a centralized manner through the Headquarters of the CMO in Trinidad and Tobago.

2.8 Figure 2 shows the general management structure above the dotted line. The Training Programme will be managed through a work programme under the direct control of the CMO, in which the assistance of WMO is likely. The other components reporting to the CMO collectively form the PMU, which is expected to be in place by the end of the first quarter of 2005. For the components below the dotted line, regional and international tendering for the Architect/Civil Works and for the Radar Manufacture and Supply were in progress, while the Regional Radar Composite System will be undertaken through a direct agreement with Météo-France.

2.9 As soon as the PMU is in place, tendering for the radar site preparation and construction of radar buildings will commence. This is being timed with the radar supply tender activities. At the same time, the CMO will activate the *Regional Coordination Unit (RCU)* to begin considering the technical aspects of the Project, especially at the national level.

2.10 In activities very closely related to the Radar Project, the CMO Headquarters will relocate to new premises within the first quarter of 2005 and will increase its professional staff allocation, both of which are expected to facilitate the smooth implementation of the Project.

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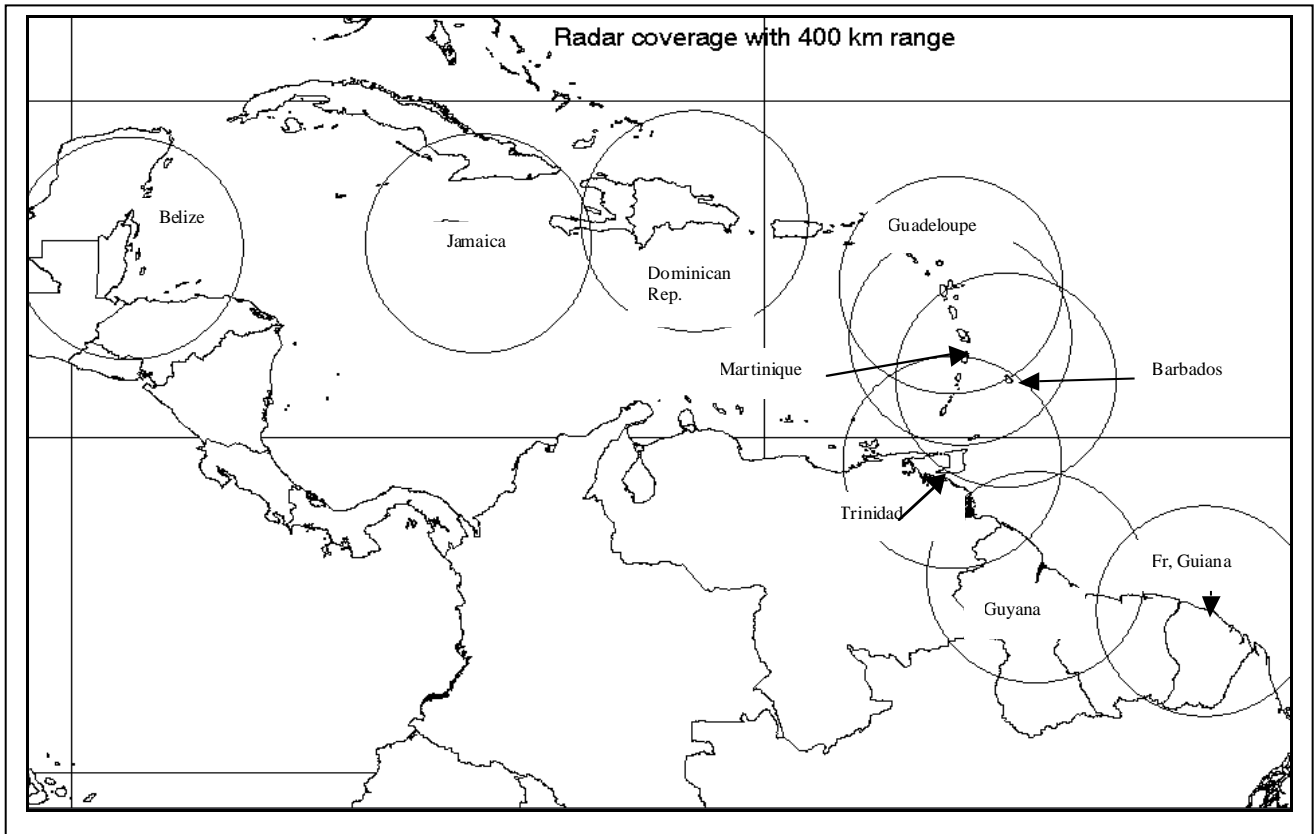


Figure 1: Theoretical radar coverage at 400 km range

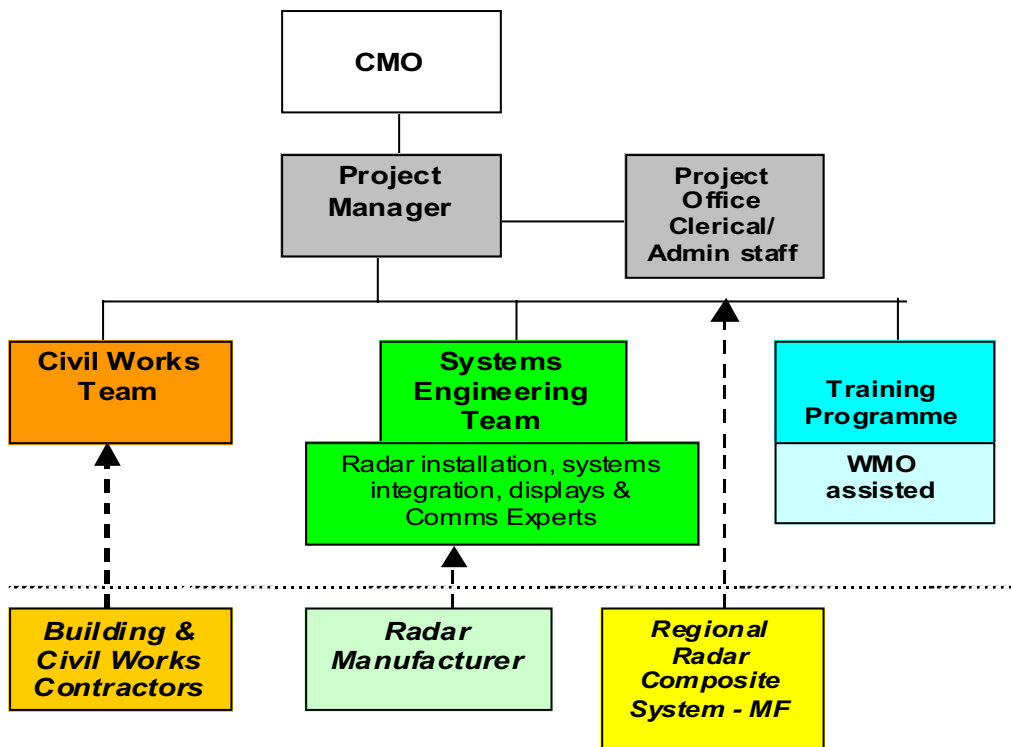


Figure 2: General Management Structure, Systems and Service supply

## ANNEX XI

### *SPECIFIC PROGRAMME NEEDS*

#### 1. World Weather Watch Programme

##### *Integrated Observing Systems (IOS)*

1.1 The Extraordinary Session of CBS (Cairns, December 2002) (CBS-EXT(02)) agreed on the following guidelines for the allocation of the priorities for technical co-operation activities for the IOS:

- (a) The highest priority should be given to the projects aimed at improving, restoring, replacing and building the upper-air observational capacities of the RBSNs. The activities should focus on the activation of silent upper-air observing stations comprised in the RBSNs;
- (b) A high priority should be given to the activities related to the improvement of data quality and coverage of surface observations of the RBSNs. The activities should focus on activation of silent surface observing stations comprised in the RBSNs;
- (c) A high priority should be given to projects related to the deployment and/or use of new and cost-effective observing systems like surface-based AWSs, AMDAR, ASAP and drifting buoys;
- (d) A high priority should be given to the projects related to the improvement of the data quality and coverage provided by newly established RBCNs.

##### *Information Systems and Services (ISS)*

1.2 As regards technical co-operation activities for the ISS, CBS-EXT(02) agreed on the following guidelines for the allocation of the priorities:

- (a) The highest priority should be given to the implementation of the connection of each NMC to the GTS for the exchange of observational data and processed information (at a minimum speed of 16 Kbits/s using TCP/IP procedures);
- (b) The highest priority for the exchange of data between RTHs at a minimum speed of 64 Kbits/s using TCP/IP procedures;
- (c) The highest priority for the implementation of the project for an improved MTN;
- (d) The highest priority for the collection of data from RBSN stations at NMCs or centres with similar functions;
- (e) The highest priority for capacity building of telecommunication and use of the Internet in developing countries;
- (f) A high priority for a backup connection of each WWW centre to the GTS, such as the reception of satellite distribution systems;
- (g) A high priority for the implementation of virtual private network (VPN) connections via the Internet as a backup for the exchange of data, in particular for RTHs.

1.3 CBS-EXT(02) agreed on the following guidelines for the allocation of priorities for polar-orbiting satellite data receivers (either APT or HRPT) and for geostationary satellite data receivers (either WEFAX or HR):

- (a) The highest priority for satellite receivers for those Members without any receiver;
- (b) A high priority for satellite receivers for those Members without a polar-orbiting receiver or a geostationary receiver;
- (c) A medium priority for satellite high-resolution receivers for those Members with only low-resolution polar-orbiting receiver or only low-resolution geostationary receivers;
- (d) A low priority for satellite receivers for those Members already exceeding the WWW goal.

*Data-processing and Forecasting Systems (DPFS)*

1.4 With regard to technical co-operation activities for DPFS, CBS-EXT(02) agreed on the following guidelines for the allocation of priorities:

- (a) The highest priority for co-operation activities in establishing access, processing and forecasting functions of NMHSs for NWP and transport modelling, application of seasonal to interannual prediction and linkages with disaster management agencies to assure effective community response to severe weather forecasts and warnings;
- (b) The highest priority for activities contributing to the improvement of the dissemination and application of weather and long-range products;
- (c) The highest priority for activities on capacity-building facilities and use of the Internet and implementation of related facilities in developing countries for improving the access to forecast products and exchanging meteorological and environmental information;
- (d) The highest priority should be given to workshops on the Ensemble Prediction Systems (EPS), including the interpretation of probabilistic products and case studies that were relevant to the trainees and a high priority to co-operation for training in EPS for those who intended to make their own products and/or who would need more specific training about products or the forecasting methodology ;
- (e) The highest priority in training on data processing, modelling, and applications support and development;
- (f) A high priority in training activities on computer operation and maintenance;
- (g) A high priority in setting up remote support, maintenance and distance training.

## 2. **Applications Programme**

### 2.1 **Aeronautical Meteorology Programme**

2.1.1 The views of Fifty-Sixth Session of the Executive Council held in 2004 regarding the World Area Forecast System (WAFS) were summarized in paragraph 6.3.12 of the general summary of the work of the session (WMO-No. 977):

*“... As a result of the decision to use the BUFR code form for the transmission of all WAFS SIGWX forecasts and the phasing out of all current T4 Chart broadcasts planned for 1 July 2005, the Council emphasized the need for urgent actions to be taken by Members to upgrade their current software with the latest versions of the GRIB and BUFR visualization software to enable them to receive these broadcasts, preferably well before the target date of July 2005. The Council urged that the development of such visualization software be completed as soon as possible. The Council noted with satisfaction that training on workstation operation and display of WAFS products in GRIB and BUFR code forms had been completed in most Regions under the SADIS broadcasts, and that plans were made to do the same for Regions under the ISCS broadcasts.”*

2.1.2 Although currently over 160 countries in the world have installed around 200 very small aperture terminals (VSAT), to access WAFS data and products, new developments related to WAFS implementation have led to a number of VCP requests being submitted to the WMO Secretariat. These requests related mainly to the acquisition and installation of upgraded satellite terminal equipment and new workstations to access, process and display the WAFS information. Furthermore, although training on workstation operations and display of WAFS products using GRIB and BUFR code forms has been completed in all WMO Regions, assistance for additional training on the use of this equipment would still be required.

2.1.3 New WAFS developments referred to above included the implementation of SADIS Second Generation (SADIS 2G) broadcasts and the enhancement of the US International Satellite Communications System (ISCS) broadcasts of WAFS and OPMET information over the Western Atlantic that serves the Americas as well as WAFS broadcasts over the Eastern Pacific that serves the Eastern part of Asia and the Pacific areas. The ISCS system had successfully undergone an upgrade to an IP based system, after a transition period with parallel operations of both the previous X.25 and new TCP/IP procedures. In Region IV, most countries are reported to be equipped with TCP/IP compatible PC-based workstations, and the upgrade of existing installations has been supported under international co-operation projects (SIDS from Finland and VCP from USA).

2.1.4 It will be further recalled that, during the final phase of the WAFS initially planned for 1 July 2005, the two World Area Forecast Centres (WAFCs), Washington and London, had plans to stop issuing all WAFS products in chart format. The dissemination of WAFS broadcasts of wind and temperatures charts will cease as planned on 1 July 2005. However, in view of unforeseen difficulties to comply with this target date for the cessation of the broadcasts of SIGWX charts, a proposal has been made to extend the broadcasts of these charts to 31 December 2006. By that new target date, the two WAFCs will have to produce graphical SIGWX charts required for flight documentation using the global gridded model output in the BUFR codes. It is therefore imperative for all countries relying on WAFS broadcasts to provide service to aviation to have access to the GRIB and BUFR coded information and to be able to prepare locally WAFS charts by 31 December 2006. Therefore, there may be a need for further assistance in training and the provision of workstations and visualization software.

2.1.5 Relevant VCP projects concerning WAFS Satellite Broadcasts terminal equipment are listed in IPM/VCP/TCO (2005)/Doc 4(3), Appendix K1.

## 2.2 Marine Meteorology and Oceanography Activities Programme

### *In situ ocean observations*

2.2.1 Large parts of the world's oceans and coastal waters are seriously data-deficient, for both surface meteorological and oceanographic observations. Many of these data deficient sea areas (*e.g.*, Indian Ocean, RA I waters, South Pacific Ocean) are adjacent to developing countries, which could thus contribute substantially to overcoming the deficiencies, but lack the technical means to do so. Specifically, their contributions would be directed towards satisfying requirements for marine surface data given in the WWW plan, for surface oceanographic data for global climate studies specified in the GOOS/GCOS Implementation Action Plan, and for local/regional marine services.

2.2.2 Detailed specifications for shipboard equipment (for the VOS and ships-of-opportunity) are given in the Guide to Marine Meteorological Services and the CIMO Guide. Specifications for coastal observing stations are also given in both guides, and have been further elaborated by JCOMM. The assistance required involves not just the equipment, but also training of local technical personnel in installation and maintenance. Steps towards such training have already been taken through the organization of three regional and two international workshops for Port Meteorological Officers (PMOs). The training imparted through these workshops needs to be backed up now through the provision of appropriate shipboard equipment, which will serve to enhance the global availability of ship meteorological reports.

2.2.3 Upper ocean thermal structure is an important variable in ocean circulation and in seasonal to interannual climate predictions. The JCOMM ship-of-opportunity programme (SOOP), co-ordinated through the SOOP Implementation Panel (SOOPIP), provides a network of ship lines deploying XBTs which is fully complementary to the new Argo programme of profiling sub-surface floats. SOOPIP works directly (in particular through its technical co-ordinator) with agencies in developing countries to facilitate their participation in the programme as well as in the application of the data generated. The VOS and SOOP, together with the ASAP Panel, now form the integrated JCOMM Ship Observations Team, which is supported by JCOMMOPS.

2.2.4 These in situ observations are crucial to global programmes such as the WWW, WCP, GOOS and GCOS, as well as to individual Members. They would benefit directly from VCP support in the provision of hardware, technical assistance and training. Such support would be most effective if directed through and co-ordinated by the Ship Observations Team.

2.2.5 As a final comment, support for such observations has been listed as a high priority at several previous VCP meetings, and it is noted that there has been several requests for support for in situ marine observing stations, including VOS equipment and training, in recent years. It is therefore disappointing that in practice no support in this area has yet been provided by donors.

### *Wave and storm surge analyses and forecasts*

2.2.6 It is a traditional responsibility of NMSs to provide ocean wave and storm surge analyses and forecasts for a variety of marine user groups. Many different types of numerical models are now available to generate wave and storm surge analyses and prognoses on local, regional and global scales. According to surveys conducted by the Regional Rapporteurs on Marine Meteorology and the JCOMM Capacity Building Co-ordination Group, a number of countries recognize the needs of wave and/or

storm surge models adapted to the local institutional and environmental conditions.

2.2.7 In the past years, training workshops have been organized to provide both technical and practical knowledge on wave and storm surge analysis and forecast modelling techniques, as well as to provide hands-on experience in manipulating and running local and regional scale models on PCs and workstations. The training imparted through these workshops needs to be backed up now through the provision of appropriate software packages, required PCs or workstations, as well as training in adaptation and use, which will serve to enhance the services provided by NMSs.

## 2.3 Public Weather Services Programme

2.3.1 The following is a summary of activities having the highest priorities within the Public Weather Services (PWS) Programme and is compatible with information on outstanding requests for assistance.

2.3.2 VCP priorities in the PWS Programme are geared to support the need of WMO Members, particularly those with small NMSs and those in developing countries, for assistance to acquire, replace or upgrade computing and communications systems in order to cater for the increased universal demand for high quality public weather services, as well as to keep up with the rapid advances in technology. These priorities include the following:

- (a) TV/Media Presentation Systems comprising high performance computing and communications hardware, peripherals and software, video equipment for television production and assorted relevant accessories, as well as the requisite training of staff to use the systems for production;
- (b) Computer systems at meteorological workstations that allow forecaster interaction and enable the creation of new or enhanced products; these will include systems to access satellite imagery (inputs) and the preparation of processed products (outputs) for users;
- (c) Increased Internet access for NMSs so they can use it as a fundamental communications tool to improve their data access, as well as expand the dissemination methods of their public weather services, and promote the use of official consistent information;
- (d) Fixed and mobile communication systems including modern telephone services preferably utilizing digital processes, mobile telephones, pagers/short message system (SMS) and fax-on-demand;
- (e) VHF radios to provide simple radio broadcast and warning alert systems; and
- (f) Training related to national PWS plans; this includes training in media skills (writing and presentation), product design, and public education and awareness among other things.

2.3.3 The high priorities listed above can be succinctly integrated into the following two foci:

- (a) Modern computing and communication systems (hardware and software) to improve data access and to facilitate design and delivery of public weather services;
- (b) Requisite training in the management, maintenance and use of the systems and in support of the provision of efficient and effective public weather services.

## 2.4 Tropical Cyclone Programme

2.4.1 Emphasis will be placed on sustainable development on the following subjects:

- (a) Training support for the attachment of tropical cyclone forecasters from Bangladesh, Myanmar, Pakistan and Sri Lanka as trainees at the RSMC - tropical cyclones New Delhi for two weeks in October 2005 (US \$7,000); and
- (b) Installation of sophisticated PC-based telecommunication equipment for Hydrometeorological Services of Cambodia and Lao PDR, with a view to helping improve their effective tropical cyclone and flood warning dissemination systems (US \$30,000).

2.4.2 The sixth biennial Southern Hemisphere Training Course on Tropical Cyclones is planned for May 2005 at the Australian Bureau of Meteorology for English-speaking meteorologists of tropical cyclone forecasters in the South-West Indian Ocean and the South-West Pacific. It is requested that VCP funds in the amount of US \$8,000 be made available to supplement the limited amount allocated from the Regular Budget for this training course in order to be able to support more additional trainees. The main purpose of this training is to assist the trainees of tropical cyclone forecasters in their efforts to improve national tropical cyclone warning systems and services.

## 3. World Climate Programme

### 3.1 Climate Database Management Systems (CDMSs) and Data Rescue (DARE) projects

#### *New Climate Database Management Systems (CDMSs)*

3.1.1 Following the evaluation, the World Climate Programme (WCP) organized a series of Climate Data and Data Management seminars in Guayaquil, Ecuador (in Spanish), Bishkek, Kyrgyz Republic (in Russian), Niamey, Niger (in French), Douala, Cameroon (in French), Kuala Lumpur, Malaysia, (in English) and Vientiane, Lao People's Democratic Republic (in English), in Beirut, Lebanon (in English), and in Melbourne, Australia (in English). Two more seminars are planned in Southern Africa and in the Caribbean in order to assess the climate data rescue and data management needs in these regions and develop plans and strategy for Climate Data Management for the countries in these regions.

3.1.2 The main conclusions of these seminars are similar and are twofold:

- Most countries need, and are ready to adopt, one of the new CDMSs, and need assistance co-ordinated through WMO; and
- Given the success of the US Upper-Air Data Rescue project in seven countries in Africa, and the Belgium support to countries in Region I, WMO has received requests for assistance from many Members for the implementation of similar projects in their countries to preserve their climatological records.

3.1.3 To follow up these conclusions the allocation of priority for the technical co-operation is:

- Highest priority should be given to activities related to Climate Data Rescue and Digitization by providing digital imaging capability to all countries to help them preserve their data; and

- A high priority should be given to projects in Climate Data Management in providing new CDMS (equipment, software and training) and also providing computer resources (equipment and software).

3.1.4 Countries with urgent needs in these two areas are:

Africa: Benin, Congo, Cote d'Ivoire, Democratic Republic of the Congo, Guinea, Nigeria, Togo, United Republic of Tanzania, Zambia;

East Europe: Armenia, Georgia, Tajikistan, Turkmenistan;

Asia: Bangladesh, Cambodia, Myanmar, Laos, Yemen, Lebanon;

Pacific: Fiji, Kiribati, Philippines, Samoa, Solomon Islands, Tonga, Vanuatu;

Caribbean: British Caribbean Territories (Anguilla, St Kitts and Nevis, Montserrat, St Vincent and Grenadines, Grenada, Turks and Caicos), Dominica, St Lucia;

Latin America: Argentina, to support its programme for reading images that could be used by the entire region; and Cuba, to support work to implement programmes for interpreting digital images using digital cameras (this knowledge could later be shared with other countries of the region).

*Provision of Data Rescue equipment*

3.1.5 The following countries in south-east Asia should be equipped with digital cameras and PCs for the creation and management of digital archives of their climate paper records: Bangladesh, Bhutan, Cambodia, Lao PDR, Myanmar, Pakistan and Sri Lanka. In Africa, high priority should be given to Madagascar, Uganda, United Republic of Tanzania and Zambia. In East Europe, Armenia, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan and Turkmenistan need to create and maintain digital archive of their paper records.

**3.2 Climate Information and Prediction Services (CLIPS)**

*Training requirement*

3.2.1 The CLIPS Project Office has initiated a programme to establish national CLIPS Focal Points and, in some cases, regional CLIPS Focal Points. These will be the contact points on matters related to CLIPS at national and regional levels. However, for them to be able to carry out their responsibilities effectively there is a need to undergo training on matters related to CLIPS through workshops specifically planned for that purpose. Such workshops have already been held for Focal Points from RA I (West Africa, Southern and Eastern Africa), west of RA II, RA V and RA VI. It is planned to extend these workshops to other regions. The experience gained from these workshops will be useful when holding workshops in other regions. Two workshops are planned to be held in eastern RA II and RA IV (Central America and the Caribbean) in 2005. Therefore, in 2005 VCP assistance will be required to support these two workshops.



Support to RCCs

3.2.2 The Executive Council has recommended the functions, guidelines and procedures for establishing Regional Climate Centres (RCCs) within RAs. In some cases, the setting up and operation of these RCCs may require additional funding for such things as regional training initiatives, acquisition of computing equipment, and for ensuring stable communications and Internet access. Donors may consider to support some of these requirements, as RCCs are intended to strengthen development of climate prediction and service programmes in NMHSs, and to build scientific capacity in seasonal to interannual prediction, verification, product development and application.

Support for CLIPS experts in understanding probabilistic forecast output, and decision-making under uncertainty

3.2.3 The WMO is planning a global conference on Climate Variability and Change: Understanding the uncertainty and managing the risks. It will be held in 2006, but the venue has not yet been established. It would be an important benefit to the work of CLIPS experts around the world to be able to participate in this event. VCP funding (for 2006) would permit the participation of at least some representatives of CLIPS programmes in developing countries.

Support for raising awareness of young people

3.2.4 WMO and UNEP have jointly developed a project proposal to create educational information on climate variability and change issues, to raise awareness of young people of the benefits and challenges of climate, the need for public and community involvement in prevention and mitigation efforts related to climate hazards, and to encourage them to be advocates of knowledge-sharing on these issues. VCP donors are encouraged to support reaching this target group with accurate but readable material, to develop the knowledge of climate that will eventually lead to improvement of livelihoods and well-being around the world. Further, this is a valuable inter-agency relationship, and WMO is in the process of making a number of efforts to more closely collaborate with UNEP wherever possible.

### **3.3 Agricultural Meteorology**

3.3.1 In the Agricultural Meteorology Programme, the main priority activities, which should be considered for VCP support, are:

- Regional Workshops in Africa on Capacity Building for Locust Control;
- World Agrometeorological Information Service (WAMIS); and
- Training to NMHSs in the use of new methodologies and tools available on WAMIS.

Regional Workshops in Africa on Capacity Building for Locust Control

3.3.2 The Desert Locust plague in 2004 drew the attention of the world to the threat they pose to the food security of the affected countries, especially in the developing world. FAO's analysis points out that conditions are favourable for locust breeding in North Africa in Spring 2005 which could bring more locust swarms into West Africa in the rainy season of 2005.

3.3.3 All the different phases in the life cycle of a locust require ideal meteorological conditions for it to evolve from the solitary phase to the gregarious phase and cause widespread damage. Given the urgency for more effective monitoring and control of desert locusts and the important role for NMHSs in this task, WMO organized an Expert Meeting on Meteorological Information for Locust Control in

Geneva in October 2004 to discuss the response from NMHSs to the current Desert Locust plague. Representatives from FAO, AGRHYMET, Italy and India attended the meeting. Additional information on this meeting can be found at: <http://www.wmo.int/web/wcp/agm/Meetings/milc-geneva/milc-geneva.htm>.

3.3.4 One major recommendation from the meeting was that NMHSs need to strengthen their collaboration with the National Locust Control Centres (LCCs) and provide near real-time daily rainfall and temperature observations and forecasts at a centralized location to provide easy access for the LCCs, regional organizations and international agencies such as FAO. To accomplish this task, the meeting recommended that WMO and FAO should jointly organize Regional Workshops on Improved Meteorological Support to National LCCs for the Francophone and Anglophone countries which would bring together staff of NMHSs and the LCCs.

3.3.5 VCP support is being requested for the organization of these two Regional Workshops, estimated at US \$20,000 for each workshop.

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

3.3.6 Disseminating agrometeorological information is part of a process that begins with scientific knowledge and understanding and ends with the evaluation of the information. But, in order for this information to be useful, it must be accurate, timely, and cost-effective. The Internet is one of the new technologies that can accomplish this since vast amounts of timely information can be found with one click of a mouse button. Additionally, the Internet can play a vital role in the training of agrometeorologists by providing useful knowledge to a large number of people in a cost-effective manner.

3.3.7 During an Inter-Regional Workshop on Improving Agrometeorological Bulletins held in Bridgetown, Barbados in October 2001, participants developed the concept of a dedicated web server for agrometeorological products. After this workshop, the Commission for Agricultural Meteorology (CAgM) recognized the need for improved access to agrometeorological products by Members and initiated a meeting to enhance the use of Internet technology. This Expert Group Meeting on Internet Applications for Agrometeorological Products was held in Washington, D.C. during May 2002 in cooperation with the National Oceanic and Atmospheric Administration (NOAA) of the United States, United States Department of Agriculture (USDA), and WMO. The primary purpose of the meeting was to develop and evaluate the required tasks to create a dedicated web server for distributing agrometeorological products and simple and effective training modules.

3.3.8 Following these workshops, the World AgroMeteorological Information Service (WAMIS) was created. The goal of WAMIS is to make agrometeorological products issued by WMO Members available to the global agricultural community on a near real-time basis. These products are produced on either a weekly, monthly, or yearly time frame and the format of the products will range from text and MS Word files to PDFs. Provision of a central location for agrometeorological information can help the users quickly and easily evaluate the various bulletins and gain insight into improving their own bulletins. To further help Members improve the quality and presentation of their agrometeorological bulletins, WAMIS will also host training modules which may include some interactive computer programs along with text and PDF files.

3.3.9 WAMIS is now fully operational and can be accessed on: [www.wamis.org](http://www.wamis.org). Funding for WAMIS for the first year was provided by the National Weather Service of the United States. VCP support is being requested for the maintenance and improvement of WAMIS for 2005, estimated at US \$10,000.

*Training to NMHSs in the use of new methodologies and tools available on WAMIS*

3.3.10 It is proposed to organize a number of training workshops in different Regions to train staff in the NMHSs in the use of improved methodologies and tools available on WAMIS for the preparation of agrometeorological bulletins and advisories. VCP support is being requested for the organization of two training workshops in RA II and RA III in 2005. Estimated funding needed is US \$10,000 for each of the two training seminars.

#### **4. Hydrology and Water Resources Programme**

4.1 In the Hydrology and Water Resources Programme, the main priority activities, which should be considered for VCP support, are:

- hydrological observing systems (in particular, automatic stations, satellite transmission equipment for automatic stations, gauging equipment);
- data acquisition and processing systems (software and hardware for database management, with particular emphasis on those countries which still maintain, partly or totally, their data bank on paper support; Geographical Information System (GIS) and Remote Sensing (RS) application to hydrology);
- training in operational hydrology with emphasis at the technician level; and
- expert services for the formulation of technical assistance projects and feasibility studies.

4.2 Many requests for VCP support in hydrology have been received. It is possible that some projects have not been supported because of the high cost involved. In such cases it might be recommended that Members scale down their request to a maximum value of US \$50,000.

4.3 Due to other major activities related to the water sector in Africa, progress has been limited in the hydrological data rescue pilot project in Africa in 2004. WMO received several requests from countries seeking to be considered in future plans. Countries which participated in Phase I requested WMO to assist to update the software.

4.4 The hydrological data rescue pilot project in Africa was successfully implemented and contributed to: strengthening the human and institutional capacity of the National Hydrological Services (NHSs) in many African countries; strengthening the capacity of trainers in Africa; and the modernization of data archiving systems in the Region. The impact of the project in the participating countries is being assessed by the Secretariat. A larger project to cover other interested countries in Africa was developed and the project proposal was submitted to UN - Water/Africa for possible implementation as a UN joint activity. Many other requests have been received from countries in other regions. During CHy-XII Members supported the project and requested WMO to expand the project to other regions.

4.5 In 2004, the data rescue project for the Russian Federation (for Valdai) was successfully completed and an additional financial support for the computer equipment and data entry will be considered for further enhancement of data rescue project.

4.6 Hydrological data rescue projects for Egypt and Nigeria were supported with the VCP(F) in 2004. The project was completed successfully in the NHS in Egypt and trainers obtained certificate for training other staff in the NHSs in the Nile Basin with the new HYDATA windows version for data

management. Nigeria has received the equipment and arrangements are underway for organizing a similar training.

## 5. **Atmospheric Research and Environment Programme**

5.1 Thirteenth Congress in its Resolution 10 had requested WMO Members to give all possible support to the Atmospheric Research and Environment Programme, with a high priority to the Global Atmosphere Watch (GAW) and the World Weather Research Programme (WWRP). Fourteenth Congress recognized that the GAW programme had a prominent role to play in monitoring global atmospheric composition (agenda Item 3.3.1) and urged Members to contribute to dedicated central Trust Funds through which their contributions could be focused on outstanding infrastructure problems in the global GAW network (agenda item 3.3.2).

5.2 Within the Global Atmosphere Watch Programme, the main priority activities which should be considered for VCP support are:

(a) Enhancement of the GAW network of monitoring stations

Support is required for monitoring of, in particular, ozone, ultraviolet radiation, aerosols, greenhouse gases, selected reactive gases (CO, NO<sub>2</sub>, VOCs, SO<sub>2</sub>) and precipitation chemistry. Assistance and advice should be provided to the WMO Members-in-need for establishing new and upgrading existing GAW stations (especially in the Russian Arctic, the Tropics, the southern hemisphere and Asia), for expanding measurement programmes in data-sparse regions;

(b) Support to improvements in quality of GAW data

Support is needed to facilitate the intercomparisons of measurement instruments (in particular ozone and UV spectrophotometers as well as automated aerosol sunphotometers), to establish regional calibration centres and to conduct regular calibration;

(c) Further development of activities in the field of atmospheric urban environment

WMO Members should be encouraged to initiate new GURME (GAW Urban Research Meteorological Environment) pilot projects in various cities (in particular where the air pollution problems are acute and urgent). Assistance will also be needed to provide training in air pollution modelling and forecasting and in developing national and regional strategies and capabilities to address urban environment problems;

(d) Enhancement of GAW training opportunities

WMO Members with more developed capabilities should be encouraged to establish "partnerships" with less developed Members to provide assistance, advice and training and to facilitate participation of GAW stations personnel in the training sessions of the GAW Training and Education Centre (GAWTEC) in Germany.

5.3 Within the World Weather Research Programme (WWRP) and Tropical Meteorology Research Programme (TMRP), the following priorities should be considered for VCP support:

(a) Enhancement of developing and least developed countries services for their sustainable development

One of the main challenges that WMO faces is to ensure that developing countries are in a position to provide the services for their sustainable development and to reduce poverty. This issue includes capacity building, education and training and is mainly focused of enhancing the research and forecasting capabilities of NMSs in developing countries to assimilate and analyze information from major centres and to generate value-added products so as to improve their capability to forecast potentially catastrophic weather, or weather-related phenomena, such as tropical cyclones, storm surges, floods and landslides, drought, sand and dust storms, and to improve and expand application to relevant economic and social activities. Thus WWRP is considering to initiate a series of Developing Country Forecast Demonstration Projects (DC FDP) aimed at realizing the potential value and impact of enhanced forecasting system and associated research activities in developing countries in different WMO Regions. Potential beneficiaries could be Morocco (focal for North Africa), United Republic of Tanzania, Caribbean countries, Brazil, Chile and other countries. Each FDP should involve a partnership between a developed country, a developing country and, where relevant, a related Regional Specialized Meteorological Centre. It would address potential funding of a particular sector of national or regional economy and the contribution of a twinning developed country is critical.

(b) Enhancement of WWRP training activities

Members are encouraged to contribute to the WWRP training activities, such as training workshops on tropical cyclone disasters and their prevention and mitigation, nowcasting, quantitative precipitation forecasting, ensemble forecasting, limited area modelling in the tropical countries, by hosting the workshops and training sessions and providing full or partial support to participants and invited lecturers.

(c) Societal impact research

Societal impact research elements are integral components of all WWRP projects and programmes (THORPEX, MAP, MEDEX, AIFI, SDS, Beijing Olympic 2008 FDP, etc.). They are aimed at developing new methods to enhance the utility of improved weather forecasts more responsive to user needs, assessment of the societal benefits arising from application of these methods and training in the use of user-specific forecast products. Members' support is needed for the whole scope of societal impact research activities oriented to various sectors of the economy and specifically in developing necessary knowledge systems applicable to societal and economic decision making.

## 6. **Education and Training Programme**

### *Education and training fellowships*

6.1 In May 2004, Cg-XIV acknowledged with appreciation the generous contributions of VCP donor Members and appealed to them to maintain and, if possible to expand their contributions to the WMO fellowships programme.

6.2 The VCP(F) annual allocations for short-term fellowships and group training activities proved most useful during the year 2004 and satisfied urgent and pressing training needs of many developing WMO Member countries. The donor Members may therefore wish to consider maintaining, and possibly increasing, these annual allocations for 2005.

6.3 The Secretariat continued the promotion of cost-sharing arrangements and the use, as far as possible and when available, of other extra-budgetary funds for the fellowship programme. These measures should complement the traditional fellowship financial resources including the VCP fellowship funds.

*Priority activities*

6.4 The main priority activities requiring VCP support are:

- Long-term fellowships for basic education in meteorology and hydrology;
- Short-term fellowships for continuing education and training (CET) in specialized fields, including the effective use of the new technologies in those fields and the training of trainers on new and advanced topics;
- Introduction of modern teaching techniques and technologies at WMO RMTCs in order to improve their Internet connectivity and to develop distance education activities;
- Special support to enhance RMTC Angola activities for RA I Portuguese-speaking countries.

7. **Regional Programme**

7.1 A number of high priority needs have been identified by Members at sessions of Regional Associations. The identified priorities for each region are given below:

*Region I (Africa)*

7.2 Regional Association I attaches the highest priority to the following actions, taking into account the WMO commitment to the United Nations Millennium Declaration for enhanced and innovative support to Africa's development efforts and the requirements by the New African Initiative strategy and action plan for achieving sustainable development in Africa:

- (a) Rehabilitation and improvement of meteorological basic systems in support of safety and sustainable development, through strategies for improving the GOS and the regional meteorological data communication and enhancing data-processing and forecasting systems;
- (b) Improvement of the visibility and the status of NMHSs through effective public information activities and assessment of the socio-economic benefits resulting from the understanding and application of water, climate and hydrology and related environmental issues;
- (c) Enhancing the natural disaster prevention and mitigation programme in support of national, subregional and regional activities and programmes relating to poverty reduction, agriculture and food security, water and sanitation and environment protection;
- (d) Enhancing a human resources development plan (education and training) to attain the appropriate technical and professional levels required to meet present and future needs, including improvement of regional climate modelling capacity, climate change impacts assessment studies and training on the use of information-communication technology;

- (e) Strengthening active collaboration and joint interdisciplinary programmes with economic groupings and organizations such as CEMAC, ECOWAS, IGAD, SADC, ASECNA, NBA, COMESA, IOC and UMA and supporting regional institutions such as ACMAD, AGRHYMET and the DMCs;
- (f) Preparation for the use of METEOSAT Second Generation (MSG) satellites;
- (g) Promotion of the provision of timely and skillfully tailored weather, water-related and climate information and prediction services to users.

*Region II (Asia)*

7.3 Regional Association II attaches the highest priority to the following issues:

- (a) Maintenance and further development of existing observing and telecommunication systems and data processing facilities;
- (b) Natural disaster reduction, mitigation and prevention through the implementation of improved detection, prediction and warning systems of tropical cyclones, monsoon depression and other extreme weather events, including associated storm surges, flash floods and droughts;
- (c) Enhancement of climate observation and monitoring as regional component of GCOS, research and application, including regional climate prediction;
- (d) Enhancement of environment monitoring, including air and water quality, forest fires, ozone, and improvement of prediction of sand/dust storms;
- (e) Implementation of the Strategic Plan for the Enhancement of the NMSs to provide better services, to the public, governments and users, through improved infrastructure and by modern technology;
- (f) Development of effective public weather services to ensure better understanding and appreciation of the value of, and increased benefit from, weather and climate and related environmental information;
- (g) Promoting and strengthening the principle of free and unrestricted international exchange of data and products among National Meteorological, Hydrological and related Services;
- (h) Enhancement of capacity building, including human resources development, to bridge the gap between NMHSs of developing and developed countries and facilitating associated technical transfer through bilateral and multilateral arrangements;
- (i) Enhancement of the collaboration and co-operation among all NMHSs in the Region and between regional centres, in particular, RSMCs, RMTCs, RICs and climate centres, drought monitoring centres, by exchange of information and knowledge and research studies on meteorology, hydrology, climate change and related environmental sciences, including numerical modelling, in order to improve the understanding and the predictions;
- (j) Strengthening meteorological applications and services for aviation and maritime transportation and agriculture;
- (k) Formulation of the Strategic Plan for the enhancement of National Hydrological Services (NHSs)

in RA II, enhancement of the planning and management of water resources, including assessment of surface and ground water resources, through:

- (i) Improvement of the operational linkages between hydrological and meteorological services with the aim to improve hydrological forecasting and to minimize impacts of natural disasters;
  - (ii) Strengthening of the hydrological components of the Tropical Cyclone Development Plans in the Region;
  - (iii) Development of plans for the establishment of HYCOS - projects in the Region;
- (l) Strengthening of collaboration with relevant regional bodies, especially ECSAP, ESCWA, ASEAN, and others.

*Region III (South America)*

7.4 Regional Association III attaches the highest priorities to the following areas of activity:

- (a) To strengthen all World Weather Watch components, especially through the modernization of the RA III telecommunications system and use of new, complementary technology such as Internet;
- (b) To strengthen the water resources sector, with a view to incorporating meteorology and hydrology into the national planning process and environmental management;
- (c) To promote professional education and training in meteorology and hydrology so that the next generation is qualified to work in these fields, and so as to ensure the continuity of projects and programmes and the ongoing quality of services;
- (d) To enhance the image of the NMHSs and upgrade their ability to produce warnings and alerts that prevent or reduce the harmful effects of weather- or climate-related natural disasters such as floods, drought, forest fires, volcanic eruptions, landslides, mudslides, and other phenomena;
- (e) To promote studies and research on climate variability and climate change and the ways in which they affect the Region, including the socio-economic and environmental impact of the El Niño/Southern Oscillation phenomenon and other extreme events, with special emphasis on numerical modelling of the climate, and to further studies on the role played by polar regions in regional climate, all of which is to be achieved by injecting new scientific and research abilities into the NMHSs in the Region;
- (f) To upgrade the Region's surface and upper-air climatological network, enabling it to provide timely and high-quality information for the purpose of monitoring climate variability and climate change in the Region;
- (g) To improve meteorological applications and services for the purposes of agriculture, air and maritime transport, and the protection of human life;
- (h) To increase knowledge and the monitoring of the environmental indicators such as air and water quality, decrease of the ozone layer, and other factors;



- (i) To strengthen the role played by meteorology and hydrology in the socio-economic development of countries insofar as these fields provide data information and knowledge, and to develop awareness of climate among planners, decision-makers and the general public;
- (j) To foster participation in and co-ordination of WMO regional projects, and projects of other international agencies conducting operations and research in the Region.

7.5 As regards the main WWW activities, Regional Association III agreed that the following issues required particular attention, and concerning VCP projects, the highest priority be given to the realization of projects under the two main WWW activities as follows:

- (a) Review of the status of the observational networks, identification of their deficiencies and development proposals for their improvement, including an increased use of AMDAR reports in the Region; and
- (b) Promotion, development and implementation of the planned Regional Meteorological Data Communication Network (RMDCN).

*Region IV (North America, Central America and the Caribbean)*

7.6 New major issues related to global environmental problems and sustainable development including climate change and natural disasters have been considered as vitally important for countries in the Region. At the same time, Regional Association IV considered that the World Weather Watch remained the core activity of WMO supporting the internationally established operational weather and hydrological services.

7.7 The Association recognizes the importance of the following specific issues:

- (a) Strengthening the role played by meteorology and hydrology in the socio-economic development of countries;
- (b) Assistance to NMHSs, particularly in developing countries in the Region, in the application of meteorological, hydrological and related data and services to various socio-economic sectors to rationalize and increase the effectiveness of these applications;
- (c) Studying the meteorological and hydrological aspects of national planning and sound management of environmental resources;
- (d) Co-operation among Members in the Region in research and development of new technologies, and in the effective use of available resources through regional initiatives;
- (e) Prevention and reduction of the effects of dangerous weather and climate phenomena;
- (f) Addressing the problem of vulnerability of social and economic systems to climate change and variability, including the impacts of El Niño/Southern Oscillation and sea-level rise;
- (g) Assessing the effects of the human activities on climate, the progress in the implementation of the UNFCCC and the development of appropriate responses to the requirements in Agenda 21;
- (h) Environmental issues including air quality standards for cities, water pollution and its implication for water use and urban water supply, transport of pollution to polar areas, and influence of the

polar areas on climate;

- (i) Strengthening and promoting the principle of free and unrestricted exchange of meteorological, hydrological and related environmental data and products.

7.8 With respect to these issues, the NMHSs should give high priority to:

- (a) Building a robust and integrated observing system for weather, water and climate;
- (b) Development of their capacity to improve weather prediction over all time scales for the general public and for special user groups;
- (c) Reinforcement of their basic climatological advisory services;
- (d) Reduction of the technology gap, including training and transfer of technology from developed to developing countries in the southern part of the Region;
- (e) Mesoscale forecasting.

7.9 The deteriorating state of some regional meteorological services, in part related to global economic difficulties, caused concern regarding possible non-fulfillment of regional goals. It was suggested that this issue be examined with a view to finding ways to minimize the likelihood of this eventuality.

Region V (South-West Pacific)

7.10 Regional Association V attaches high priority to the following issues:

- (a) Natural disaster reduction through the provision of more reliable and effective warning of tropical cyclones, monsoons depression and other extreme weather events, including associated storm surges and flash floods, as well as El Niño; technical support and advice to implement the Tropical Cyclone Operational Plan for the Region; and through the organization of workshops such as on public weather services, to increase public awareness and response of disaster mitigation and related warnings;
  - (i) Improvement of the quality of data, products and services using more effective management, and should make use of new information technology, in particular the Internet and regional Intranet, web sites and television presentations for the distribution of data and information to users and the general public;
  - (ii) Strengthening of the observation network of stations (including GCOS) and exerting best efforts so that key upper-air stations are maintained in operation, including through the establishment of special funding to cover spares and consumables as required;
  - (iii) Strengthening the role and services of the RSMC and Nadi Tropical Cyclone Centre;
  - (iv) Development of reliable seasonal and inter-annual forecasting capability to ensure an effective drought warning system and application of forecasts to water resources management, agriculture and other key socio-economic sectors;
- (b) Improved understanding of the nature and extent of potential threat from climate change and variability as well as extreme weather events in the Region, especially with respect to the

impact of the sea-level rise on low-lying islands and countries with extensive coastlines;

- (i) Assistance to, and advice on, the implementation of the climate monitoring network and completion of a definitive historical climate data set for the Region;
  - (ii) Strengthening of the regional component of GCOS and the Regional Climate Centres;
  - (iii) Assistance to fully implement the GAW stations in the Region, including the global GAW station in Indonesia;
  - (iv) Provision of timely and reliable advice to governments on the state of the global and regional climate on various time scales;
  - (v) Enhancement of awareness and use of assessments of climate change, its impact and options for response strategies, especially through the IPCC and participation in the activities of the UNFCCC;
- (c) Enhanced capacity building and regional co-operation;
- (i) Enhancement of the human resources development through relevant education and training activities with particular emphasis on continuing education and training;
  - (ii) Organization of regional seminars and/or technical conferences on environmental issues and sustainable development;
  - (iii) Effective application of meteorological and hydrological information and knowledge to achieve sustainable development, and capacity building actions in this area;
  - (iv) Promote the role and activities of WMO in the Region and in the development of NMHSs by providing appropriate advice, guidance and support for resource mobilization such as through the Subregional Office for the South Pacific;
  - (v) Strengthening the collaboration with relevant regional bodies, especially SPREP, IOC-WESTPAC, ESCAP, ASEAN, the South Pacific Commission, South Pacific Forum, and the South Pacific Applied Geoscience Commission (SOPAC);
  - (vi) Full integration of all countries in the Region, including new and potential Members, in the work of WMO.
- (d) Implementation of operational hydrology activities in the Region through:
- (i) Introducing effective systems and technologies in safeguarding the limited amounts of groundwater resources, in particular of small island states (atolls);
  - (ii) Fostering the establishment of a Pacific HYCOS through external financial support from ADB, SPREP or United Nations Development Programme (UNDP) to prevent increasing scarcity, gradual destruction and increased pollution of freshwater resources;
  - (iii) Providing an additional venue for the exchange of information and experience among representatives of small island states outside the normal cycle of Regional Association V sessions and Working Group on Hydrology meetings to define and address their urgent needs.

7.11 In view of the above, VCP support should be considered in 2005-2007 for the following:

- (i) Observing system: a high priority should be given to upgrading the surface and upper-air observing network in order to enhance its performance;
- (ii) Information system and services: an important and urgent issue is to upgrade all EMWIN (Emergency Managers Weather Information Network) receivers which are used by 18 Pacific countries, since significant changes to the technical specifications of transmissions are planned for 2005 including reduced power level, change in frequency and signal format. The changes require replacement of all the EMWIN receivers;
- (iii) Data-processing system: strengthening the capability of NWP centres to provide products in support of the specific requirements of Members in the Region should be given a high priority. Continued support to RSMC Nadi – Tropical Cyclone Centre and ASEAN Special Meteorological Centre (ASMC) - Singapore should be required;
- (iv) Climate Computing (CLICOM) and Data Rescue projects should be further developed in the Region, in particular the implementation of the projects in Niue, Papua New Guinea, Samoa and Tonga. The regional project entitled “Climate Data Rescue for Economic, Environment and Social Development (CDRES)” should be given high priority;
- (v) There is a strong desire by RA V Members, in particularly Small Island Developing States (SIDSs) to update their skills to enable them to enhance the provision of information and services relating to El Niño events to user community. A high priority should be given to a regional monitoring workshop;
- (vi) Assistance to foster the implementation of the Pacific-HYCOS and training for hydrological technicians in SIDSs in the Pacific region should be given a high priority;
- (vii) Special attention should be given to the education and training programme, in particular for Pacific Island countries, especially the long-term training fellowship and the implementation of the “Regional Capacity Building in Meteorology for Small Island Developing States (SIDS)”;
- (viii) Continued assistance is needed for Members in RA V, particularly those of SIDCs in the Region, to secure resources for the implementation of Strategic Action Plan for the Development of Meteorology in the Pacific Region (2000-2009) and the proposed projects resulting from the needs analysis.

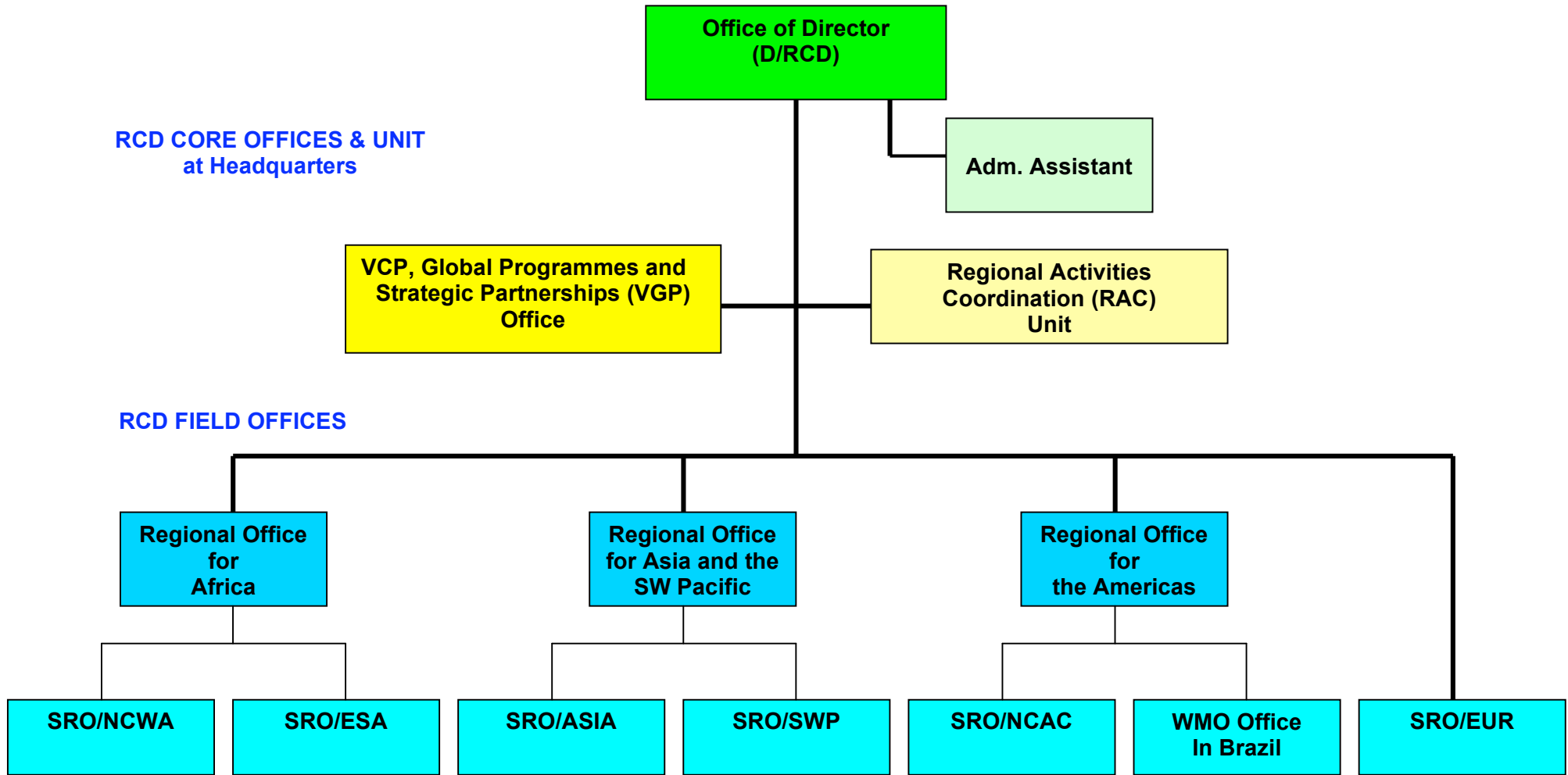
*Region VI (Europe)*

7.12 Regional Association VI recognizes the importance of the following issues:

- (a) Improvement and optimization of the global systems for observing, recording and reporting on the weather, water resources, ocean, climate and the related natural environment in the most effective and efficient manner, including the standardization of techniques for observing data and planning networks on a regional basis, with emphasis on:
  - (i) The operational implementation of the RBSN Plan and Regional HYCOS;

- (ii) The promotion of the introduction and performance assessment of appropriate observing technology, taking into account new systems and their suitability;
  - (iii) The full implementation of the Regional Meteorological Data Communication Network (RMDCN) to provide a high level of service throughout the Region;
  - (iv) The development and implementation of end-to-end real-time monitoring of the operation and performance of the WWW and, in particular, of availability and quality of data;
  - (v) Development and implementation of hydrological observing systems for real-time flood forecasting applications and water resources assessments;
  - (vi) The enhancement of an implementation of transition from traditional character data representation and exchange to binary data representation and exchange;
  - (vii) The implementation, where appropriate, of the concepts of joint operation, joint funding and burden sharing in the context of the WWW to assist Members in achieving the most effective and efficient implementation and sustainable operation of WWW system components;
- (b) Improvement of the accuracy and reliability of the analysis, forecasts, warnings and risk assessments of natural hazards such as floods, strong winds, droughts, forest fires, severe storms, avalanches, pollution events and periods of intense relative heat and cold. This should include improving seasonal and longer term predictions of changes in the timing, severity or frequency of such severe events;
- (c) Enhancement of capacity building, especially for the developing countries and those whose countries are in transition. In this connection:
- (i) Capacity building should particularly address the required basic meteorological and supporting infrastructure and equipment, especially in the areas of telecommunication and upper-air sounding, as well as the education and training of staff;
  - (ii) Technical co-operation should ensure optimal benefits and take into account the overall situation of countries to be assisted;
  - (iii) Sustainable capacity building should be aimed for, and not just ad hoc palliative measures;
  - (iv) To realize capacity building, areas of strategic co-operation, including regional/subregional collaboration, should be explored
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**ANNEX XII**



**RCD CORE OFFICES & UNIT  
at Headquarters**

**RCD FIELD OFFICES**

ANNEX XII

## ANNEX XIII

### Breakout Group 1 VCP and World Conference on Disaster Reduction (WCDR), Kobe, January 2005

#### Overview of Kobe strategy

The Kobe strategy is to reduce loss of life and property from natural disasters caused by events of hydro-meteorological origin, which constitutes the majority of natural disasters, thus giving WMO the role of a major partner in international actions in this realm.

#### Role of the WMO

Seeing the challenge ahead, it is proposed that WMO set an indicator; to reduce the decadal average of disasters by hydrometeorological problems by 50%.

WMO and its Members should therefore:

- Highlight the relation between disaster and development - vulnerability to poverty = vulnerability to disaster;
- Recognize the importance of creating a culture of disaster resistance;
- Facilitate capacity building especially in SIDS and LDCs;
- Tracking progress – no consensus yet – but indicators are needed.

#### Central theme of Kyoto declaration

Substantial reduction of disaster losses requires the following:

1. Governance;
2. Science and technology - earth observation, communication;
3. Public awareness - terminology education.

Five areas of action to ensure disaster risk reduction are:

1. National integrated disaster risk reduction mechanisms;
2. Identify, assess and monitor risks;
3. Enhance early warning systems;
4. Capacity building and public education by strengthening disaster preparedness at all levels, especially at the local level;
5. Reduce the underlying risk factors from weather, water, climate variability and climate change by changing behaviours and better planning.

#### *At a practical level*

Early warning systems:

- In the country – improve government structures;
- National coordination;
- Science and technology - earth observations – enhance GCOS and space technologies, GIS modelling predictions;
- Establish understandable terminology – conduct studies and improve terms so that they are meaningful and useful for people;
- Enhance communication networks – describe these networks and enhance last mile;
- Help people plan - how to react to warnings.

Rehabilitation and reconstruction:

- Land use planning and new zoning;
- Replacing meteorological equipment;
- Inundation mapping.

Cost benefits:

- Fund training workshops on meteorological economics and increase our own studies and analysis of the work of meteorological offices.

Community Education:

- School children;
- General public.

Areas on which to focus VCP funding to help propagate end-to-end disaster reductions:

1. Transfer of knowledge, technology, expertise and for disaster risk reduction;
2. Workshops;
3. Expert teams;
4. Training attachments;
5. Enhance capacity building at international and local level;
6. Research – sharing findings and lessons learned through case studies;
7. Distribution of journals and scientific findings to both the NMHS community and the broader community at large;
8. Risk assessment and precautionary advice;
9. Sound database on hazards created by disasters – maybe consultants should carry out the baseline exploration of the risks involved.

Problems specific to developing countries NMHS

It is necessary to help NMHSs in developing countries understand that this preparation is an important use of their resources. How can we as donors help to lead this charge? It is at the national level that this is going to be most important.

Developing countries will continue to have problems in convincing their government of the importance of end-to-end disaster systems. We need to change our operating mode from systems to making sure of the public's education. The governments do not understand what the role of the NMHS is.

IOC documents do not reflect the role of the NMHS. We need to make a clear, pointed statement that shows that the work of the NMHS is not just producing weather forecasts. We at WMO, as VCP donors, need to more clearly describe what their role is all along the disaster management cycle, and how we can best serve as a coordinating body.

How do we get our governments to act differently? We in the meteorological community have been doing this for a long time, but how do we get our governments to make the change?

In LDCs the concern is that we have to concentrate on keeping the basic systems running and the people trained. It is occasional education, but for consistency it would be helpful to have WMO support for teaching the developing country policy makers to enhance disaster preparedness. We need to recommend assistance in the local capacity building that places emphasis on systems and puts it back on to capacity building.



To promote funding for developing countries we first have to get our thinking skills aligned to enhance consistency and effective efforts. We can focus on key issues together and they may be the things we have been doing already, but by reframing them we may be able to express them somewhat better.

Summary points

What is new and what is the challenge for securing the role of NMHSs in end-to-end disaster loss reduction?

- Clearer understanding that disaster is not just a humanitarian response – that there is a chance for pre-disaster planning;
- It is clear that disaster and sustainable development are linked. National level actions are critical;
- A disaster cycle exists and we can share that and must help people to see the whole cycle including reducing vulnerability;
- To allocate 10% of humanitarian relief funds for the next 10 years;
- The challenge is to make this meaningful on the national level and make clear the role of the governments and NMHSs;
- We need to project the NMHSs to be on the platform of the national plan and an integral part of the whole planning on disaster reduction for all hazards;
- One dollar invested in pre-disaster management can prevent the expenditure of seven dollars later on recovery;
- Good products must be at the heart of this strategy – to get information to policy makers in ways that will be available in an emergency;
- Window of opportunity is small – this is the best time to act.

**Breakout Group 2**  
**How to help developing NMHSs exploit developed world initiatives**  
**such as GEO and THORPEX**

*Background: a few key elements*

GEO is a multi-government initiative; a country has to sign up to enter the GEO grouping; and THORPEX is a scientific initiative; the entry gate can be through CAS and/or ICSU. Therefore the way to involve developing countries depends on the context.

What about NMHSs involvement?

- For GEO, the interest is to join a collective initiative where the primary benefit is oriented to governments and citizens rather than to NMHSs;
- For THORPEX, the challenge is to provide new observations and forecasts designed to improve the severe weather conditions, in particular;
  - to convince financing bodies to invest in weather research rather than climate research;
  - to design a global experiment for the next ten years;
- Many studies have given insights on weather and climate in different regions (e.g., Hadley Centre for RA I), but there are no mechanisms in place to take advantage of this; there is a lack of capacity building, at least to exploit the outputs (specific products) from developed centres (e.g., ECMWF seasonal forecasts).

*Recommendations: tentative keys ideas*

- Explain why developed countries and their NMHSs are in these initiatives and how the developing countries can participate;
- For GEO, show them the way to approach other national agencies involved and provide rationale to contact their governments to convince them to join. Demonstrating that the meteorological and hydrological information framework is already in place should give increased visibility to NMHSs and attract the attention of governments and ministries on meteorology and hydrology (rather than on other topics, e.g., aeronautics in Transport Ministries);
- For THORPEX (as for AMMA), take into account the specific needs of developing countries (in order to counter the picture of biased R&D to mid-latitude concerns), set priorities in the business plan that clearly address the issues of developing countries;
- Set up pilot projects involving the developing countries and their NMHSs from the design stage onwards (already in place for THORPEX);
- The chance for capacity building should be set as a priority, and monies flowing to the NMHS would increase where the NMHS is the leading, or one of the leading, representative institutions for GEO or THORPEX at the national level;
- Many developed countries have already built secretariats to coordinate GEO at their national level. Two ideas are:
  - Look to what is going on at the GEO and THORPEX secretariat level and try to migrate good practices at the national level; and
  - Exchange experiences after a while to share lessons and improve the possible benefits for NMHSs.

### **Breakout Group 3**

#### **Key areas in TCO for Sustainable Development**

Definition of Sustainable Development: “to satisfy the needs of the present without prejudicing needs of the future” (but note that such a definition may not be simple to turn into guidance).

In considering Sustainable Development it is helpful to consider it under three headings:

- Economic
- Society
- Environment

The functions of a NMHS are to provide information and advice in all these three areas. The NMHS is therefore one of the gateways into global and local information, and should add value to the information by presenting it in ways relevant to the decision-makers. Therefore the NMHS of a country has a responsibility to focus on the Sustainable Development requirements of the country.

These requirements will include safety of life and property, recognizing the effect of natural disasters on economic development, society and the environment. Answering these requirements should take into account culture, gender, technology and environment issues of the end users.

The aim for Technical Cooperation is to help the NMHSs to be more relevant and effective in delivering benefits to their nations. Important aspects to this are helping the NMHSs to bridge the gap in capability, to have belief in themselves, and to develop and deliver relevant products and services.

### **Breakout Group 4**

#### **How dedicated data servers can help NMHSs**

NMHSs should use WMO Information Systems (e.g., GTS) to exchange meteorological data and products, but for those which have extreme difficulties in connecting to these systems (e.g., some LDCs), the Internet can be used as an interim backup system until a long-term solution is established.

Some LDCs do not have the resources or expertise to establish a GTS line, purchase computers to run NWP models, install satellite receiving stations, operate radars, install VSAT to receive WAFS products, to derive vertical temperature profiles using ATOVS radiance data, etc. They have to rely on assistance provided by developed centres. They often can, however, afford to have the Internet, which is relatively cheap and information can then be downloaded.

It is possible for any NMHS (especially in the LDCs), in an emergency situation, to download from Internet servers free of charge some of the data/products they need to run a NMHS: OPMET data, simple satellite pictures, simple radar imageries, WMC/WAFS/RSMC products (analyses, prognoses and other NWP products), and special products (e.g., MOS-forecasts for specific cities) through registered user Internet services provided by donor countries.

RANET is one of the proven ICT technologies that can provide the Internet through the WorldSpace satellites.

Recently, Advanced Dissemination Methods (ADM), which are dedicated servers to provide free non-conventional data, have become available, e.g.:

- SATAID (Satellite Animation and Interactive Diagnosis) Server operated by Melbourne provides MTSAT LRIT data: this could be a source of LRIT for developing countries in the Asia-Pacific Region as an alternative to operating a satellite ground receiving station;
- EARS (European ATOVS [Advanced Tiros Operational Vertical Sounder] Retransmission Service) which can provide ATOVS data for NWP models.

Using these as a concept, theoretically donors can establish ADMs/dedicated data servers or other ICT technologies to disseminate/broadcast:

- WAFS products;
- EMWIN products;
- AMDAR data;
- composite radar imageries;
- composite satellite mosaics covering the whole globe;
- many others.

IPM urges therefore that to the extent that reliable high-speed Internet connectivity is available:

- Donor countries should be responsive to requests by developing countries to provide special products through registered user Internet services on special servers; in the event that only low-speed is available, graphical outputs should be made available;
- Donor countries should be innovative in the establishment of dedicated data servers/ADM to disseminate specialized data and related products;
- NMHSs of developing countries should voice their needs through the World Summit on Information Society; and
- As a matter of principle, any meteorological exchange via the Internet should also conform to Resolution 40 (Cg-XII) – WMO Policy and Practice for the Exchange of Meteorological and related Data and Products including Guidelines on Relationships in Commercial Meteorological Activities.