

WORLD METEOROLOGICAL ORGANIZATION

PUBLIC WEATHER SERVICES

EXPERT MEETING ON CAPACITY BUILDING STRATEGIES IN PUBLIC WEATHER SERVICES

San Jose, Costa Rica

30 November- 4 December 2004



FINAL REPORT



EXECUTIVE SUMMARY

An Expert Meeting on Capacity Building Strategies in Public Weather Services was organized under the Public Weather Services (PWS) Programme in Costa Rica from 30 November to 4 December 2004. The meeting was chaired by Ms Vilma Castro (Costa Rica). Under its terms of reference, the Expert Meeting had to develop guidelines on aspects of capacity building strategies pertinent to the PWS Programme, following the review of the existing situation and identification of gaps in this area of work of NMSs.

The key conclusions from the work of the Expert Meeting are summarised below.

TOR (1)

- The Meeting reviewed the existing situation as regards the preparation, dissemination and application of products and services for the public in each region and cited specific examples from a number of countries.
- The Meeting noted that in all regions there was some level of services provided to the users and in particular to the public and that the NMSs were generally aware of the importance of their role as providers of warnings and public forecasts. As expected some regions were more advanced in this area through the creation of regional groupings and efforts to specifically address the requirements of NMSs as providers of PWS and those of the public as the recipients.
- Nevertheless the Meeting noted that there was room for improvement in the variety and user friendliness of NMSs products and services provided.

TOR (2)

- The Meeting identified a number of existing gaps in NMSs relevant to PWS. These arose mostly from lack of specific focus on PWS-related matters such as a clear user focus, understanding user requirements and response to them, useful partnerships with relevant sectors in society, detailed policies, efficient and skilled communication, and sufficient resources.
- The Meeting further identified a clear gap in the existing WMO education and training materials and activities in specifically targeting PWS-related topics and issues when training personnel in meteorology and operational hydrology.
- The Meeting considered that these gaps represented a major impediment to the NMSs in reaching their potential for fulfilling their mission in satisfying public needs and agreed that a wide range of measures were required to address these gaps. These could be brought together in the guidelines proposed under TOR 4.

TOR (3)

- Following extensive discussions on the merits of a strong PWS programme in both the NMSs and the Secretariat, the Meeting outlined the strategy to bring PWS into focus as an important area of the work of NMSs. These strategies are outlined in the guidelines to be prepared under TOR 4.

TOR (4)

- Following brainstorming sessions, the Meeting prepared the outline of the guidelines on strategies towards capacity building in PWS (Appendix I). The Meeting agreed on a schedule for the production of the guidelines by mid-June 2005.

1. INTRODUCTION

1.1 The Meteorological Service of Costa Rica in cooperation with the RMTC at the University of Costa Rica kindly agreed to host an Expert Meeting on Capacity Building Strategies in PWS organized under the Public Weather Services (PWS) Programme of WMO. The WMO Sub-regional Office for the Americas provided assistance in the logistics for hosting this event. The Expert Meeting was held in San Jose on 30 November and in Punta Leona from 1 to 4 December 2004. The Meeting was chaired by Ms Vilma Castro (Costa Rica). Ms Haleh Kootval (Chief, Public Weather Services Division, WMO Secretariat) welcomed the participants on behalf of the Secretary-General and briefed them on the recent activities of the programme as regards capacity building. She indicated that the present Expert Meeting was the result of the particular emphasis placed by WMO Members on the importance of improving the capability of NMSs in service delivery. She drew attention to the Meeting's Terms of Reference (TOR) as follows:

- 1. Review existing strategies/plans in capacity building:**
 - a) At NMSs**
 - b) Through the WMO Education and Training Programme**
- 2. Identify existing gaps specifically targeted towards PWS**
- 3. Discuss strategies for capacity building in PWS**
- 4. Prepare guidelines for use by NMSs on strategies for capacity building in PWS**

1.2 The Expert Meeting began its work with considering reports prepared by individual team members on TOR 1 and brainstorming sessions on TORs 2 and 3. These are included in this final report.

The list of participants is given in Annex I. The programme of the Meeting is contained in Annex II.

2. BACKGROUND

2.1 The Meeting was informed by Ms Kootval that the WMO 14th Congress had approved the organization of an expert meeting to advise the NMSs of Members and especially those in developing countries on the importance of building the capabilities of the staff of NMSs in maximizing the effectiveness of their staff in service delivery to the public. Developing skills in areas such as communication, consultation, marketing, economic issues, and quality measurement and assurance is increasingly becoming an integral part of the tasks of staff of NMSs dealing with PWS matters. The capacity building issue has occupied an important place in the PWS Programme since its establishment in 1991. This work has been received with enthusiasm on the part of Members and Fourteenth Congress agreed that time was right to concentrate on formulating capacity building strategies to assist Members in providing the best possible services to the public.

2.2 The results of work under the various TORs of the Expert Meeting are summarized below.

3. THE EXPERT MEETING WORK PROGRAMME

3.1 TOR (1). Review existing strategies/plans in capacity building:

a) At NMSs

b) Through the WMO Education and Training Programme

3.1.1 All participants carried out the work on this TOR. Regarding the existing situation of PWS, there were many differences among regions as well as common aspects.

3.1.2 The representative of RAII expressed that there is a paradox in developing and least developed countries as on the one hand they increasingly face the requirements of the government and the public for issuing accurate and timely weather forecasts and warnings. On the other hand a considerable number of NMSs are not able to take advantage of modern technology due to lack of resources and therefore the expectations of their governments and general public are not fulfilled. Since there is a strong relationship between the successful development of PWS programs and modern technologies, limited access to these technologies represents a weak point for PWS in developing and least developed countries.

3.1.3 The experiences of the Iranian Meteorological Organization (IRIMO) in the development of their PWS were highlighted at the Meeting. These experiences illustrated building capacities among meteorologists, decision makers and user communities by highlighting the role of meteorology in society. In building capacities, emphasis was put on the importance of contacting and collaborating with:

- school teachers and students
- scientists and university students
- policy makers (national and provincial level)
- farmers and community focal points
- voluntary societies
- artists
- travelers and passengers

3.1.4 NMSs in RAII provide different kinds of PWS, including some that have been traditionally provided and some that respond to specific demands that arise from particular requirements.

3.1.5 The main PWS provided can be grouped into:

- Information for governmental decision makers
- Raw meteorological information
- Weather forecasts and climate outlooks
- Meteorological warnings and alerts

- Educational products for the public

3.1.6 Information for decision makers is usually presented in monthly forecast bulletins printed and distributed to ministries and regional governments. Meteorologists, private companies and students are the main users of raw meteorological information. They usually have to make their request at the NMSs in person since the Internet information request is not yet a generalized service.

3.1.7 Weather forecasts and climate outlooks, usually at a regional scale and for the main cities, are addressed to the man in the street to help plan everyday activities as well as for tourism and public gatherings, such as sports events. In the rural areas, forecasts are used to plan agricultural activities. There is however a strong demand for more local and detailed forecasts that cannot be produced by the NMSs due to their limited resources compared to the size of the countries in the Region.

3.1.8 Meteorological warnings and alerts are prepared in order to minimize the impact of potentially destructive meteorological events. Potential risks in the Region include hurricanes, heavy rain, landslides and forest fires amongst others.

3.1.9 Education for the public is directed at helping the general public understand the environment in which they live. This helps them adapt to and exploit the local weather conditions and, at the same time, improve their capability to understand the information disseminated by NMSs.

3.1.10 In RAIII, PWS products reach the public through different channels, the most important of which are:

- The media
- Sectoral institutional systems such as disaster prevention and management systems or health systems
- NMSs websites
- NMSs 24h telephone lines in some countries
- Printed bulletins

3.1.11 Relationships with the media vary from country to country but in general most NMSs have access to TV, radio and newspapers, for the dissemination of forecasts. None charge for this service although some countries such as Colombia are considering charging for specialized services while maintaining free periodical press bulletins and press releases for special events.

3.1.12 National systems for disaster prevention and mitigation are the main channels to disseminate alerts and warnings. This is done through national, regional and local disaster management committees whilst NMSs are the official authority to produce warnings. Alerts and warnings are also published in press releases through web pages. In some countries in the Region, other governmental agencies such as the health sector and the environmental institutions cooperate with NMSs to help disseminate information such as UV radiation, risk and forest fires warnings. Short and direct printed bulletins are produced periodically mainly aimed at decision makers.

3.1.13 In most countries in RAV procedures to provide PWS have been developed using common sense, according to local idiosyncrasy and circumstances. Staff normally gain their knowledge in PWS delivery through working with more experienced colleagues.

3.1.14 Attempts to improve the communication with the public in the specific case of Costa Rica have included employing a journalist in the NMS, making agreements with the largest TV station, improving the presentation of the information for the media, education of the media, creating a webpage and a department to provide meteorological information to the public.

3.1.15 The RMTC in Costa Rica is used by Spanish speaking countries in RAV III and IV to train their staff, where training is focused on theoretical aspects of meteorology. There is no course on PWS, nor are topics on PWS included in any course. Graduates develop their own operational skills.

3.1.16 Some NMSs are run by technicians or professionals without formal meteorological background and some are limited to the service of aviation due to lack of recognition of their role by the governments. In some cases forecasters have tried unsuccessfully to warn the population of a dangerous weather situation because of lack of credibility and appropriate channels to send the message. Examples of these situations include Hurricane Mitch in 1998 and extensive landslides in the north coast of South America in 1999.

3.1.17 The provision of public weather services in Region V ranges from a strongly public-good-based approach (Australia) with free provision of all relevant information to and through the media, to a primarily commercial model of service provision (New Zealand). The NMSs of South-east Asia and the South Pacific employ a variety of intermediate arrangements with a heavy emphasis on the NMS warning function for tropical cyclones in the South Pacific.

3.1.18 The Australian Bureau of Meteorology maintains a close partnership with the mass media with locally tailored weather segments in most capital city and regional newspapers and local forecasting staff involved in regular radio interviews and the like. This has tended to build strong public and political ownership of the Bureau service offices and a generally high level of community support for the Bureau's operations. Particularly since the inclusion of radar data, the Bureau website has become by far the most frequently accessed government website in Australia.

3.1.19 Public weather services are generally seen as a primary *raison d'être* of most of the NMSs of the Region and the public perception of the value of the services is mostly high. Good collaboration exists in the transfer of PWS information and expertise among RAV Members. The bulk of the meteorological education and capacity building in PWS provision in RAV is carried out through the training courses at the Australian and New Zealand NMSs and the RMTC in Manila. Particular emphasis is given to the development of skills in media liaisons and presentation of weather information on NMSs websites.

3.1.20 In RAVI, a Subgroup on Regional Aspects of PWS was created in 1998. This Subgroup has been working in 3 areas related to PWS

1. Cross border exchange of warnings and forecasts
2. Capacity building
3. Visibility and credibility of NMSs

3.1.21 One of the first actions of this Subgroup was to develop a questionnaire that was sent to all countries of RAVI. The feedback was very encouraging ; 79% of the NMSs replied. From this questionnaire it was concluded that the four greatest problems related to PWS at the NMSs are lack of staff, education and training, relation with users and work with the media. Examples of cooperation between NMSs and users include that of the Meteorological Institute in Portugal (IM) where cooperation with other public services, such as civil protection authority, health authority and hydrological service has been implemented over the last years. As regards the National Civil Protection Service (SNBPC) an active cooperation has been developed since 1998 in the form of the attachment of a meteorologist to SNBPC to be a focal point and to develop an education and training program for some of the technicians from the SNBPC. Currently, a daily videoconference is conducted between the technicians from SNBPC and the forecasters from the Weather Forecasting Center. This daily briefing has led to teamwork between the NMS and SNBPC staff. The health authority is also involved in the briefing whenever the meteorological situation justifies it.

3.1.22 NMSs of Portugal and Spain have an active cooperation in the area of operational forecasting since 1998. There is a routine cross border exchange of warnings, regional forecasts and synops between the two NMSs. As of 2005 there will be also a cross border exchange in real time of radar data and LAM outputs.

3.2 TOR (2). Identify existing gaps especially targeted towards PWS

3.2.1 Discussions on this item closely followed those under TOR 1. The Meeting identified substantial gaps and inadequacies in PWS capacities in all regions including in particular:

- The absence of any specific training in PWS provision (including media presentation, user consultation, public policy development) for most meteorological staff in most countries.
- A generally low level of public awareness of the capabilities of the NMSs and their potential ability to meet a wide range of user needs in many countries.
- Inadequate meteorological expertise of many of those involved in TV and radio presentation of weather information to the community at large.
- Inadequately developed user focus and service ethics in many NMSs.
- Inadequate credibility as well as insufficient public capability to understand NMSs products.
- Lack of efficient communication with the public in an understandable language.
- Lack of detailed policies on the products and services that should be provided by the government.
- Lack of forecasts on local and more detailed scales, particularly for use by the farmers.
- Lack of adequate resources (human, financial and technological) in some NMSs to respond to PWS demands.
- Inadequate or even non-existent partnership with the media.

3.2.2 The Meeting considered that these gaps and inadequacies could in turn be traced to the lack of a specific PWS focus in much of the meteorological education and training work of the WMO. In particular:

- PWS provision is not specifically addressed in the WMO Guidelines for Education and Training of Personnel in Meteorology and Operational Hydrology (TD-No 258)
- There is little available by way of guidance documents for PWS provision; specifically:
 - There is no explicit definition of PWS in WMO documents
 - There are no detailed policies on PWS provision in WMO training documentation
- There is a wide variety of actors that could help in the financing, provision and dissemination of PWS. The concept of partnership has not been strongly developed in WMO training programs.
- Most NMSs have not historically been encouraged or assisted to foster a strong user focus and service ethic.
- The competencies for PWS provision have not been defined.
- There are few mechanisms in place for assisting NMSs in the introduction of new technology for PWS provision.
- Determination of user needs for PWS and user assessment of PWS performance and value has not been adequately built into the training of NMS staff.
- User needs and user assessment of PWS have not been adequately taken into account by some NMSs in priority setting for the allocation of resources.
- In general, NMSs products are good but are not reaching the public in the extent they could. There is no generally accepted approach to the cultivation of user consultation and feedback in respect to the provision of PWS.
- There is still a lot of room to improve the way in which NMSs products reach and are used by the public in general. With more investment, NMSs products can be adapted to satisfy additional public needs.

3.2.3 The Expert Meeting considered that these and other gaps in PWS position and related capacity building represented substantial impediments to the improvement of the performance of PWS in both developed and developing countries.

3.2.4 The Meeting considered that addressing these gaps and inadequacies would require a wide range of measures, which could be brought together in the guidelines proposed under TOR-4 and ultimately incorporated, inter alia, in a subsequent edition of WMO No 258.

3.3 TOR (3). Discuss strategies for capacity building in PWS

3.3.1 This term of reference formed the substance of the Meeting. The Meeting discussed at length the merits of a strong PWS programme in both the NMSs and the WMO Secretariat. It then moved on to outlining the strategy of NMSs and WMO as an organization in bringing

PWS into focus as an important area of the work of NMSs, which deserved its own identity. These strategies were included in the outline of the guidelines to be developed into a technical document by the Expert Meeting.

3.4 TOR (4). Prepare guidelines for use by NMSs on strategies for capacity building in PWS

3.4.1 Following the brain storming sessions, the Meeting got down to preparing the outline of the guidelines which was the main output of the Meeting. It was recognized that the guidelines would be mainly aimed at NMSs from developing countries and that they should assist those countries in meeting the requirements of their customers in delivering the best possible services. The outline of the guidelines is attached as Appendix.

4. FUTURE FOLLOW-UP The Expert Meeting agreed on the following schedule for the production and publication of the guidelines:

- Completion of the draft of guidelines to be sent to the Secretariat for internal discussion by end of **March 2005**.
- First review by members of the Expert Meeting by **mid April 2005**
- Final editing at the Secretariat by **early May 2005**
- Publication and distribution of the document to all WMO Members by **mid June 2005** (prior to the 57th session of the EC)

5. CLOSING

5.1 The Expert Meeting expressed appreciation to the Meteorological Service of Costa Rica, the RMTTC and WMO Sub Regional Office for the Americas for the excellent arrangements made and the warm hospitality extended to the participants.

5.2 The Expert Meeting closed at on Saturday 4 December 2004 at 5 p.m.

Annex I

Participants at the Expert Meeting on Strategies for Capacity Building in PWS

(San José, Costa Rica, 30 November – 4 December 2004)

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PUBLIC WEATHER SERVICES EXPERT MEETING ON CAPACITY BUILDING STRATEGIES IN PWS
(San José, Costa Rica, 30 November to 4 December 2004)

PROVISIONAL PROGRAMME

	Tuesday, 30 November	Wednesday, 1 December	Thursday, 2 December	Friday, 3 December	Saturday, 4 December
AM 0900	1. Opening 2. Meeting Objectives 3. Terms of Reference: review and modify if necessary	5. Discussion of TOR 2 6. Discussion of TOR 3	8. Break into sub-groups to develop table of contents 9. Meet as a whole team to review guidelines outline and table of contents	11. Continue developing text	14. Final review of the draft guidelines 15. Schedule of the follow-up until completion
1200					
	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>
PM 1330	4. Discussion of TOR 1: presentations by the participants	7. Discussion of the outline of the guidelines	10. Start developing text for the guidelines	12. Each sub-group presents draft texts 13. Assemble draft pieces and develop more text as necessary	16. Review and adoption of the report of the meeting 17. Closure
1700					

Chapter I

INTRODUCTION

1.1 PURPOSE OF THE GUIDELINES

1.2 THE CONCEPT OF CAPACITY BUILDING

1.3 THE SCOPE OF PUBLIC WEATHER SERVICES

- PUBLIC

- WEATHER

- SERVICES

1.4 BASIC AND SPECIALIZED SERVICES

1.5 THE ROLE OF NMHSS

1.6 THE ROLE OF OTHER GOVERNMENTAL AGENCIES

1.7 THE ROLE OF PRIVATE MET SERVICE PROVIDERS AND ACADEMIC INSTITUTIONS

1.8 THE ROLE OF THE MEDIA

1.9 THE CONCEPT OF A NATIONAL METEOROLOGICAL SERVICE SYSTEM

CHAPTER II

METEOROLOGICAL SERVICES OF SPECIAL RELEVANCE TO PUBLIC NEEDS

2.1 NATURAL DISASTERS

2.2 AGROMETEOROLOGY

2.3 HYDROMETEOROLOGY

2.4 MARINE METEOROLOGY

2.5 AERONAUTICAL METEOROLOGY

2.6 ROAD METEOROLOGY

2.7 URBAN METEOROLOGY AND AIR POLLUTION

2.8 CLIMATOLOGY

2.9 ENVIRONMENTAL METEOROLOGY

2.10 BIOMETEOROLOGY AND HUMAN HEALTH

CHAPTER III

HOW SOCIO-ECONOMIC SECTORS CAN BENEFIT FROM PWS

3.1 DECISION MAKERS WITHIN THE GOVERNMENT

3.2 RISK AND DISASTER MANAGEMENT AUTHORITIES

3.3 AIR, MARINE, TERRESTRIAL TRANSPORT CUSTOMERS (SUCH AS TRAVELERS, DRIVERS, PASSENGERS, etc.)

3.4 AGRICULTURAL COMMUNITY (SUCH AS FARMERS, etc.)

3.5 EDUCATION SECTOR (SUCH AS STUDENTS, TEACHERS, RESEARCHERS, etc.)

3.6 TOURISM, LEASURE AND SPORTS (ATHLETES, SPECTATORS)

3.7 ENERGY AND WATER MANAGEMENT

3.8 HEALTH

3.9 FISHERIES

3.10 NATURAL RESOURCES MANAGEMENT

3.11 FINANCIAL SECTOR (SUCH AS RISK INSURANCE, DERIVATIVES, etc.)

3.12 CONSTRUCTION INDUSTRY

3.13 LAND AND URBAN PLANNING

3.14 MAN IN THE STREET

CHAPTER IV

NEEDED SKILLS, COMPETENCIES AND TOOLS

4.1 PROGRAM PLANNING AND MANAGEMENT

4.2 NEW TECHNOLOGY ASSESSMENT AND IMPLEMENTATION

4.3 PARTNERSHIPS BUILDING

4.4 WORKING WITH EMERGENCY MANAGERS

4.5 PUBLIC COMMUNICATION

4.6 COMMUNITY OUTREACH

4.7 INVOLVEMENT OF VOLONTEERS

- 4.8 PUBLIC AWARENESS AND UNDERSTANDING
- 4.9 BUILDING PUBLIC CONFIDENCE
- 4.10 MEDIA LIAISON
- 4.11 WORKING EFFECTIVELY WITH ACADEMIA
- 4.12 TRANSFER OF TECHNOLOGY TO DEVELOPPING COUNTRIES
- 4.13 METEOROLOGICAL ECONOMICS
- 4.14 USER CONSULTATION
- 4.15 CULTIVATION OF THE SERVICE ETHIC
- 4.16 QUALITY ASSURANCE
- 4.17 PUBLIC POLICY DEVELOPMENT

CHAPTER V

BUILDING THE REQUIRED CAPACITIES

- 5.1 SEMINARS AND WORKSHOPS IN CAPACITY BUILDING
- 5.2 CONTINUING EDUCATION TRAINING PROGRAMS
- 5.3 OUTPOSTING WITH USERS SECTORS
- 5.4 STAFF ATTACHMENTS TO OTHER NMHSs
- 5.5 PARTNERING BETWEEN NMHSs
- 5.6 TECHNICAL COOPERATION
- 5.7 TRANSFER OF TECHNOLOGICAL AIDS
- 5.8 DEVELOPMENT OF BIBLIOGRAPHY ON CAPACITY BUILDING
- 5.9 CAPACITY BUILDING COURSES AT RMTCS
- 5.10 FORMALIZING COMPETENCIES AND SKILLS REQUIREMENTS IN PWS (WMO
258)
- 5.11 GOVERNMENT BRIEFINGS ON PWS
- 5.12 REGIONAL AND SUB-REGIONAL COOPERATION