

Report on the Meeting of the Public Weather Services/Education and Training Expert Group on Public Education and Outreach

Geneva, 22–24 March 2006

1. Opening and organization of the meeting

1.1 The Meeting of the Public Weather Services (PWS) /Education and Training (ETR) Expert Group on Public Education and Outreach was opened by Professor Yan Hong, Deputy Secretary-General, at 9 am on 22 March 2006 at the Headquarters of the WMO Secretariat in Geneva.

1.2 In his opening address, Professor Yan emphasized the role played by NMHSs in not only preparing accurate weather forecasts and warnings, but also in ensuring that those products and services are delivered to the public and other users and that they are properly understood and acted upon for maximum effectiveness. In this regard, NMHSs have an important role to play in educating the users of their products in how to use such products. This is the reason why the Public Weather Services Programme of WMO, in close collaboration with the Education and Training Programme, has taken the initiative to develop a project to help those NMHSs which require assistance in educating their public. The aim is to increase understanding of the usefulness of public weather services as well as increase awareness of the uncertainty in weather forecasts. The project is also aimed at promoting in primary and secondary schools the better understanding of the Earth Sciences and to make the profession of meteorology and hydrology more attractive to the public.

1.3 The expected result of this project is that the public will be better equipped to make informed decisions and to respond appropriately to official information disseminated by the NMHSs. This will result in a reduction in the loss of life and livelihood from severe weather events and, equally important, better use being made of weather information in the daily social and economic activities. Professor Yan concluded that the project would contribute to achieving a major long-term objective of the public weather services programme of WMO, namely "To foster a better understanding by the general public of the capabilities of NMHSs and of optimal ways to use their services". It would also contribute to achieving the goals of the ETR programmes on school and popular meteorological and hydrological education.

1.4 The list of participants is given in Annex I. The agenda for the meeting is given in Annex II. The purpose and terms of reference of the Expert Group are given in Annex III.

2. Clarify objectives and expected outcomes

2.1 The Expert Group was informed that the rationale for its formation was to go beyond the formal supply of educational manuals that have so far been prepared by WMO and made available to NMHSs for use in training their own staff. The changes in the working environment of NMHSs, from purely technical to encompassing economical and political aspects, require more sensitivity by NMHSs to the needs of their users and communities, and the importance of trying to cater to those needs. Consequently effort is required to create better awareness amongst users and communities of products and services provided by NMHSs. The main objectives of the project are to demonstrate the relevance of NMHSs to the end-users and to promote a better understanding of the earth sciences in schools and the public at large. At the same time there is a need to demonstrate in a more rigorous way the contribution made by NMHSs to the sustainability of socio-economic development. An important component in any education programme should be targeted towards children, young people and the public.

2.2 The Expert Group divided the target area for any public education and outreach activity of NMHSs into three categories:

- **Supporting educational activities** – Increasing understanding of the science related to weather climate and water in schools.

- **Supporting the user community** – Increasing awareness and use of public weather services with particular emphasis on reducing the effect of severe and high impact weather.
- **Supporting policy and decision makers** – Increasing understanding of the socio-economic benefits of public weather services and enhancing the reputation of NMHSs.

The Expert Group agreed that the education programmes aimed at children of primary and secondary school age were of vital importance and that every efforts should be made to address the needs of this particular target group. Also it was recognised that policy and decision makers have particular requirements which may be difficult to address.

3. Communications between providers and users of services

The Expert Group considered the three target areas and identified the major issues in each group as follows:

- **Supporting educational activities**
 - ✓ Creating broad understanding of meteorology and hydrology in young children.
 - ✓ Providing material, which supplements existing curricular in schools.
 - ✓ Providing information, training and tools for teachers.
 - ✓ Educating the public so as to make the profession of meteorology and hydrology more attractive
 - ✓ Encouraging NMHSs to forge links with educational authorities and providing them with examples on how to do this.
- **Supporting the user community**
 - ✓ Using language and terminology which is appropriate and understandable.
 - ✓ Providing reliable access to information in an appropriate format, with emphasis on the information that can be used to help with the daily life.
 - ✓ Having a media strategy in place to use a weather event as an educational and responsive opportunity.
 - ✓ Building confidence with the public.
 - ✓ Understanding the needs of the users.
 - ✓ Forecasting the impact rather than just hazards.
 - ✓ Involving the existing development community in new initiatives including preparedness, hazard mitigation and environmental awareness.
- **Supporting policy and decision makers**
 - ✓ Speaking the language of the policy makers with emphasis on benefits.
 - ✓ Highlighting the socio-economic benefits of meteorological and hydrological services.
 - ✓ Emphasising the role NMHSs in support of policy-making.
 - ✓ Recognising that case studies may be of value when compared to preparation of appropriate generic materials.

4. Presentations by experts

4.1 Each of the experts made a presentation on their experiences in the field of public education and outreach. Brief summaries of the presentations are given paragraphs 4.2 to 4.8. The full presentations are available from Haleh Kootval upon request.

4.2 **Ms Hilda Lam** gave a full account of the efforts of the Hong Kong Observatory (HKO) on public education and outreach. These involve the three categories:

- Disaster Risk Reduction: in support of operation of warnings and raising awareness of disaster risks.

- Popularization of meteorological knowledge: through promotion of better understanding of meteorological phenomena and the better understanding of the strength and limitation of weather forecasts.
- Publicity to enhance the image of the HKO: through promotion of trust in the NMHSs as the meteorological and warning authority.

The work in different areas of education was carried out through production and distribution of pamphlets, brochures, announcement on radio and television, seminars, training courses, films and CDs on topics of interest, explanation of meteorological phenomena of interest, history of HKO, fact sheets about HKO, performance pledge booklet, exhibits in the history room of the HKO, press releases, and interviews. In addition, during the quiet season visits to HKO, outreach and visits to schools and elderly homes and open days were arranged. Ms Lam also described the characteristics of effective education and outreach materials, the need for generic materials on education and outreach to be used internationally as well as the suitable media used for delivery of generic material.

4.3 **Dr N. Jayanthi** in her presentation described the education and outreach activities of the India Meteorological Department (IMD). She described the objectives for the decision making management and administration authorities as bridging the gap between scientific know how and field level do how. As for the public education at grass root level the main purpose is to teach them how to react to warnings during adverse situations and creating confidence amongst the public about forecasts and warning products. Dr Jayanthi described in detail the Participation of Youth in Real time Observation to Benefit Education (PROBE) programme in India. This comprehensive programme involves installation of meteorological observatories in schools, publication of books for different grades of students, seminars, workshops and symposiums. She also outlined the mandatory introduction of "Environmental" topics by the Central Board of Secondary Education, India, for classes 8th, 9th and 10th (ages 13 to 15). Finally she outlined the NMHS's immediate plans for outreach to target audiences. The programme for these outreach activities include the role of the NMHS and various services provided, interpretation of the products, economic benefits and sustainable development, and terminology.

4.4 **Dr Teresa Kennedy** presented different educational outreach and dissemination strategies utilized by NSF, NASA, UCAR and the GLOBE Programme. GLOBE is mainly concerned with inquiry-based educational activities for primary and secondary schools and is Web based, although in the developing countries the material is also produced in printed form. The programme has 109 partner countries with over 31,000 trained teachers representing more than 17,000 schools worldwide. The main aim of the programme is to bring together students, teachers and scientists to enhance environmental awareness and contribute to scientific understanding of the Earth. The GLOBE Web site is open to all users for access and the material is translated into 6 official languages of the UN. The partnership between GLOBE and WMO is being strengthened through the signing of an MOU. It is planned that, once this process is finalized, it will allow the formal involvement of NMHSs in the GLOBE international training programmes.

4.5 **Dr Bob Riddaway** described the learning centre of the UK Met Office. The Web pages are designed to help teachers and pupils by extending their knowledge of weather and climate in the UK and around the world through the provision of dedicated activities and learning materials for students and teachers at all levels of education. Primary and secondary resources contain selection of activities and learning materials for students and teachers. In addition, higher resources cater for A-level students and teachers and also those studying at higher education. There is another part of the Met Office Web site that provides information about what to do before, during and after severe weather events.

4.6 **Ms Nadia Zyncenko** spoke from the perspective of a TV station and the role of a weather broadcaster for general public education. She described the initiative of the Argentine NMHS to undertake school visits by designating roving meteorologists to provide materials to the school teachers. The evaluation of the success of the programme would be carried out by the education authorities who would provide feedback to the NMHS. Ms

Zyncenko also described the formation of close working relationship between the NMHS and the news editors in the TV, radio stations, and newspapers which helped better and more effective communication with the viewing audience. The NMHS Web site provides many materials for primary and secondary school as well as for the general public. This site is also linked to the WMO Web site.

4.7 **Mr Kelly Sponberg** described the Project RANET which has focused on a specific information need and has trained farmers how to apply the information. He described in detail, the challenges facing the project such as access, literacy, lack of formal training opportunities and how some of them have been overcome. The experience of RANET has clearly shown that radio is the most effective way of reaching the public in rural areas of the developing world. Mr Sponberg also informed the Expert Group of new satellite and two-way communication capacities to be utilized by RANET. These capacities could offer new opportunities to support education and outreach activities – particularly in remote and rural communities where access is limited. Additionally, the new communication systems being incorporated by RANET should allow “global” coverage in the next year, thereby offering services in RA III, RA IV, and RA V where capacity was previously limited. An interesting point about RANET is the potential of its use for dissemination of warnings in rural areas where conventional media is not available.

4.8 **Mr Gerald Fleming** spoke about the role of the media in public education and outreach, and of the need for good communication skills in order to pass on the message correctly and to keep the audience interested. He elaborated on the current structure of broadcasting in different parts of the world and indicated that broadcasters can be a significant resource to be used for public education and outreach. He also described the situation in Ireland where, although the National Met Service is not particularly active in public education and outreach activities, weather is on the school curriculum. Some very attractive and useful brochures have been prepared, by the National Met Service and others, for use by the marine, agriculture and water sports communities.

5. Key points emerging from the presentations

5.1 At Annex IV is a list of key points that emerged from the presentations. These were taken into account when developing the action plan.

6. Development of an action plan

6.1 Part of the strategy for the PWS/ETR programme is to encourage and facilitate the production, distribution and use of public education material in cooperation with others as appropriate. To support this strategy the Expert Group agreed that the objective of the public education and outreach project is as follows.

To inform and educate the public, primary and secondary school students, policy and decision makers, and other interested parties about the scientific understanding and socioeconomic benefits to be derived from weather, water, climate and related environmental services such as preparedness for and mitigation of natural hazards, and environmental stewardship.

6.2 To achieve the objective of the public education and outreach project a set of actions were agreed by the Expert Group.

1. **Web resource.** Develop a Web resource that will:

- (a) Provide strategies to facilitate the development of regional and national education and outreach campaigns.
- (b) Provide links through the WMO web site to available materials on the web in a structured manner (e.g. different topics, different regions).
- (c) Identify hardcopy material and provide an appropriate catalogue which includes information on sources.

- (d) Provide advice about good practice in developing public education and outreach material, illustrated by suitable case studies and guidance on appropriate media formats.

Note that it is important to identify categories of material by users and topics. Also it is essential that links are properly maintained.

2. **Communications strategy.** Create a communications strategy to maximize awareness of the web resource (e.g. through the WMO bulletin, Meteo World, WMO website and through individual messages to be sent to WMO members).
3. **Limited survey.** Conduct a limited survey amongst the members of the OPAG on PWS on available public education and outreach materials and identify additional areas of need.
4. **Full survey.** Examine and enrich the existing four-year ETR survey on education and training needs of NMHSs to establish baseline data from which to build and maintain strong public education and outreach programmes for the public, schools, policy and decision makers and other relevant parties.
5. **Partners.** Identify appropriate partners who can help produce, distribute, and promote the use of public education and outreach material. Identify existing distribution and follow-up networks (technical and human), current communication capacities, and common barriers to access and use.
6. **Complementary activities.** Identify complementary activities required to support public education and outreach programmes on a national and regional basis in order to enhance a focus on environmental impacts and science (e.g. training for trainers/educators and building on existing training events and opportunities).
7. **Pilot projects.** Identify and facilitate national and regional pilot projects whereby training strategies, material and methodologies (as referred to in the points above) can be tested, if possible in WMO Regions I (Africa), II (Asia), III (South America) and VI (Europe), before being implemented more widely; where appropriate make use of the facilities offered through RANET and GLOBE.

6.3 The specific actions required by the members of the Expert Group and the timeframes are given in Annex V.

7. Preparation and adoption of the report

7.1 The key aspects of the report were agreed by the Expert Group.

7.2 It was agreed that the Chairman would finalise the report and submit it to the Secretariat for distribution.

8. Closure of the meeting

8.1 Prior to the closure of the meeting, the Expert Group agreed that the important work to be undertaken and completed would give this project an ongoing nature. Although most of this work would continue via correspondence, further meetings of the Experts would be necessary to consolidate the efforts started at this initial meeting.

8.2 The meeting of the Expert Group on PWS/ETR Public Education and Outreach closed at 1500 hrs on Friday 24 March 2006.

ANNEX I. List of participants

LIST OF PARTICIPANTS AT THE MEETING OF THE PUBLIC WEATHER SERVICES/EDUCATION AND TRAINING EXPERT GROUP ON PUBLIC EDUCATION AND OUTREACH (22-24 MARCH 2006)

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ANNEX II. Agenda of the meeting of the Expert Group

MEETING OF THE PUBLIC WEATHER SERVICES/EDUCATION AND TRAINING EXPERT GROUP ON PUBLIC EDUCATION AND OUTREACH

22 to 24 March 2006

Agenda

1. ORGANISATION OF THE MEETING
 - 1.1 Opening of the meeting
 - 1.2 Agree agenda
 - 1.3 Agree working arrangements
2. CLARIFY OBJECTIVES AND EXPECTED OUTCOMES
 - 2.1 Why is a public education and outreach programme required and who is it aimed at?
 - 2.2 Why is there a gap in understanding between providers and users of meteorological services?
 - 2.3 What topics need to be covered by an public education and outreach programme?
 - 2.4 What is the expected outcome of the meeting?
3. COMMUNICATIONS BETWEEN PROVIDERS AND USERS OF SERVICES
 - 3.1 Why is there a gap in understanding between providers and users of meteorological services?
 - 3.2 What topics need to be covered by an education and outreach programme?
4. PRESENTATIONS BY EXPERTS
 - 4.1 What public education and outreach material is available?
 - 4.2 What are the characteristics of effective public education and outreach material?
 - 4.3 What media can be used for delivering public education and outreach material?
5. KEY POINTS EMERGING FROM THE PRESENTATIONS
 - 5.1 What are the key points emerging from the presentations?
 - 5.2 What good practice can be identified?
6. DEVELOPMENT OF AN ACTION PLAN
 - 6.1 Who will do what by when?
 - 6.2 How will generic public education and outreach material be distributed?
 - 6.3 How will we know if the public education and outreach material has been used effectively?
7. PREPARATION AND ADOPTION OF THE REPORT
8. CLOSURE OF THE MEETING

ANNEX III. Purpose and terms of reference

PUBLIC WEATHER SERVICES/EDUCATION AND TRAINING EXPERT GROUP ON PUBLIC EDUCATION AND OUTREACH

PURPOSE OF EXPERT GROUP

1. The Expert Group is established to provide WMO with recommendation and guidance for assisting NMHSs to educate the public and decision-making authorities so as to increase their understanding of the usefulness and limitations of weather forecasts, to increase their trust in forecasts, and to increase their understanding of the risks of a particular hazard or series of hazards.
2. WMO will use the guidance and recommendations to develop public education and outreach materials for use by NMHSs with the aim of transferring this knowledge to the public, through working with educators.

COMPOSITION

3. The Expert Group is composed of experts from the NMHSs, education community, user community and the WMO Secretariat.

TERMS OF REFERENCE

4. The Expert Group will be constituted under the Applications of Meteorology Programme through PWSP working in close collaboration with the Education and Training Programme and the relevant Technical Departments in the WMO Secretariat.
5. Each member of the Expert Group will collect existing education and public outreach materials from NMHSs as well as educational and other institutions..
6. Based on the existing materials, the Expert Group will prepare for distribution by WMO a set of generic educational materials to address a) the general public and b) decision-making authorities, suitable for adaptation to different languages and cultures.
7. The experts, through NMHSs, will work with educators to transfer this knowledge to the public at all levels and decision-making authorities.
8. Members of the Expert Group will interact with the WMO Secretariat, to ensure consistent implementation of the guidance material developed by the Expert Group.

ANNEX IV. Key points emerging from the presentations by members of the Expert Group

- **Lots of material available** – Place emphasis on using what is available (e.g. GLOBE, country material) rather than developing new material.
- **Lots of distribution networks exist** – Where possible use existing networks (e.g. National Broadcasters, RANET, Sector-Specific Journals).
- **Need for material that can be localized** – Generic material needs to be localized for maximum effect (e.g. Indian material localized by State to address specific language and hazard requirements)
- **Resource requirements** – Training can be resource intensive, and many NMHSs do not have the necessary resources, so partnership is very important to maximize resources.
- **Audience specific materials** – The language and design of material needs to be appropriate for the various target groups. In particular material for children requires a very different approach to that targeting user groups, professionals, or even the general public.
- **Teacher support** – Teachers need ready-made curriculum and resource materials.
- **Training of trainers** – More opportunities are required to train the trainers.
- **Provision of certificates** – Certificate programmes are an important tool and a method of encouraging participation in training, as well supporting the application of received training.
- **Supplementing existing curricular** – In many areas the school curriculum is already set, therefore meteorological information should be supplemental.
- **Top-level buy-in** – When supplementing the curriculum, get buy-in at top management or ministry level (especially within the education ministry).
- **Success stories** – Encourage use of success stories or anecdotes to help users understand potential applications.
- **Presentation of material** – Material serious in intent does not need to be serious in presentation. In fact it may be more effective to present material through comics, soap operas, etc. which have entertainment appeal.
- **School events** – Organizing events for schools or others is an effective way to engage the community, encourage ownership, and maintain interest.
- **Evaluation** – Evaluation of impact and feedback an important aspect to any education or training campaign. It is necessary to know the reach of campaign, the effectiveness in communicating information (knowledge building), and finally the impact on change in behaviour.
- **Timely educational campaigns** – High impact events, or upcoming seasons, offer an opportunity to conduct educational campaigns.
- **Emphasising impacts** – It is important to not only educate the public about high impact events, but also to increase awareness potential impact of events. There is a need to provide better information on local relevance of weather and particularly on impact of weather, water, and climate.
- **Using the media** – Broadcasters, journalists, and other media need to be proactively approached with material to raise issues and build awareness amongst the public.
- **Use of ongoing meetings** – Ongoing meetings (particularly regional seminars and workshops) involving producers of products and services can be used to involve users and schools.
- **Communications in rural and developing areas** – In rural and developing areas, radio (audio) is a very important means of reaching many people. Print is also good medium but requires greater attention to distribution.

- **Importance of self-teaching** – Public education and outreach campaigns need a follow up mechanism through which interested users can further self-teach, once initial training received. Education is not static or a one-time effort; it is a dialogue and dynamic process.
- **Disaster management** – Disaster management requires specialized attention from country to country because of differences in disaster management, response, structures, capacity and regulation.
- **Using enthusiasts** – In many countries there are networks, societies, etc. of the general public who are quite interested in weather. These are groups that can be used to distribute as well as test and even help develop educational material.
- **Campaign/educational strategy** – Distribution of materials should be part of campaign/educational strategy.

ANNEX V. Specific actions allocated to members of the Expert Group

Item	Action	Led by	Contribution from	Timeframe
1(a) 1(b)	EG to send to the Chair ideas and proposals for inclusion in strategy, and suggestions for additional material and Web links.	All	All	By April 7 th
1(a) 1(b)	Write out strategies. Collate and edit list of Web links.	BR		By April 21 st
1(b)	Discuss with WMO Webmaster the setting up of the Public Education and Outreach Web site.	Secr.		April 30 th
1(c)	Define database structure and field headings for a catalogue of hardcopy material	KS	Feedback by EG	April 1 st Feedback April 7 th
1(c)	Collect information regarding available hardcopy material and send summary material to database manager.	EG		Ongoing after April 14 th
1(d) 2	Provide advice on good practice, suitable case studies, and guidance on media formats, and send to the Chair. Provide also suggestions re communications strategy.	EG		April 30 th
1(d)	Pull together and draft advice as above into a coherent document	BR	Feedback from EG	May 14 th
2	Develop communications strategy to maximize awareness of Web resources.	BR		May 14 th
3 4	Prepare questionnaire for a limited survey.	BR		March 31 st
3	Circulate questionnaire to members of the OPAG and EG	GF/HK		April 7 th
3	Analyse responses to the questionnaire	BR		May 17 th
4	Finalise questions for inclusion in the quadrennial WMO Education and Training survey.	BR		May 31 st
5	Perform rapid assessment and provide guidelines on the involvement of partners who can help produce, distribute, and promote the use of educational and outreach material. Draft to EG	KS		May 8 th

5	Comments on draft assessment as above	EG		May 22 nd
6	Provide information to Chairman and Secretariat on suitable opportunities for the promotion of education and outreach activities	EG		Current information by April 30 th Ongoing
7	National pilot activities planned in designated countries by July with deployment in Q3/Q4 2006.	TK/KS	EG	July 1 st
7	Provide information on progress of the pilot activities.	TK/KS NZ/GF/NJ		April 1 st 2007
7	Preliminary report on the progress of pilot activities.	BR	EG	April 15 th 2007