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STATUS OF WIGOS PILOT PROJECTS

Pilot Project IV

Elaboration of the underpinning / crosscutting role and responsibilities of the Instruments and Methods of Observation Programme in the context of WIGOS

(Submitted by Mr Rainer Dombrowsky (USA))

Summary and Purpose of Document

This document provides information on the implementation of WIGOS Pilot Project IV as identified by Cg-XV.

ACTION PROPOSED

The meeting is invited to note the information on activities and status of the Pilot Project IV contained in this document when considering further implementation of WIGOS and the relevant update of WIGOS Development and Implementation Plan.

- References:**
1. Abridged final report of the EC-LX (WMO-No. 1032)
 2. Final report of the first session of the EC WG WIGOS-WIS

- Annexes:**
1. Template of Pilot Project IV
 2. Role and Responsibilities of the Commission for Instruments and Methods of Observation (CIMO) within the framework of the WMO Integrated Global Observing Systems (WIGOS)
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Pilot Project IV

Elaboration of the underpinning / crosscutting role and responsibilities of the Instruments and Methods of Observation Programme in the context of WIGOS

1. Introduction and key deliverables

1.1 The CIMO WIGOS Pilot Project "*Elaboration of the underpinning/crosscutting role and responsibilities of the Instruments and Methods of Observation Programme in the context of WIGOS*" required an assessment by CIMO's Management Group as to how CIMO's roles and responsibilities might change under the WIGOS framework. At the first meeting of the CIMO Ad-hoc Working Group (31 January – 2 February 2008) it became evident that CIMO's role would require broader and more in-depth communication and collaboration with other technical commissions, WMO partner organizations that co-sponsor, own and/or operate observation/monitoring systems as well as future WIGOS partners. Based on this assessment the Working Group reviewed, discussed and drafted a set of guidelines for CIMO within the WIGOS framework. The drafting of new CIMO TORs became the first order of business for the pilot project (PP). The newly drafted TORs were accepted as the first phase of the CIMO Pilot Project and would be tested and evaluated during the period of the pilot project. If during the implementation and validation period it is determined that modifications to the draft TORs are needed the Ad-hoc Working Group will review and agree on any needed modifications. The drafting of the TORs, constitutes the first phase of implementation and their implementation, evaluation and validation constituting the second phase of the CIMO PP.

1.2 The Ad-hoc WG followed on with discussions related to the development of proposals for CIMO's Pilot Implementation Plan. After lengthy discussion among the WG participants it became evident that CIMO's role during the PP implementation and evaluation period would require CIMO's technical assistance and collaboration within the various pilot and possibly some demonstration projects being conducted during the initial phases of WIGOS/WIS implementation. The WG defined the second phase in the following manner; CIMO would develop proposals for its role within WIGOS pilot projects and possibly demonstration projects. During this phase CIMO representatives would also engage the WIGOS PPs to determine the level of CIMO involvement needed to successfully implement their respective PPs. Through these collaborative efforts CIMO could validate its draft TORs as well as aid in the implementation and operational performance of the WIGOS PPs.

1.3 Since the initial Ad-hoc WG meeting the idea of establishing a third phase to the CIMO PP. This will be discussed in greater detail during the second session of the Ad-hoc WG scheduled for November 24-25, 2008. Briefly, the third phase would independently track the progress of CIMO activities and tasks associated with each pilot and demonstration project in which CIMO has been requested to assist. Annex I to this document contains the latest update to the proposal template.

2. Scope

2.1 The cooperation of CIMO within its PP requires greater CIMO outreach to each pilot project and if requested to assist with demonstration projects. However, the Ad-hoc WG did agree that CIMO activities and tasks should remain realistic taking into account time and resources, especially with respect to the availability of CIMO experts. However, this project will permit the development improved relationships between CIMO and other technical commissions and programmes within the WMO and the development of new working relationships with future WIGOS partners.

3. Activities

3.1 ***CIMO Meeting*** - The *Ad-hoc* planning meeting for the CIMO Pilot Project (CIMO PP) for WIGOS was held in Geneva, Switzerland, January 31 - February 1 2008. The recommendations from the Executive Council Working Group on WIGOS-WIS were discussed and the PP updated so that it is in line with the WIGOS Concept of Operations (CONOPS).

3.1.1 The WG discussed the existing CIMO TOR and determined that they would require some changes to fit into the framework of WIGOS. The draft TOR can be viewed in Annex II of this document.

3.1.2 The WG requested that the CIMO President, Dr John Nash, present the draft CIMO TORs at the February 2008 Meeting of the Presidents of Technical Commissions. The WG made this request to secure additional feedback from technical commissions not represented at the WG meeting.

3.1.3 The WG requested that the CIMO Vice-President, Mr Rainer Dombrowsky be the Project Manager for the CIMO PP and represent CIMO at other Ad-hoc PP meetings. Through attendance at these meetings CIMO would acquire a better understanding of the role CIMO might play in other pilot and possible demonstration projects.

3.1.4 The meeting invited each of the WIGOS pilots to send a participant to represent their pilot program at the meeting; three of the remaining four pilot projects were in attendance and assisted in the review of CIMO TORs and the drafting of new TORs under the WIGOS framework.

3.1.5 The PP representatives in attendance provided dates for the meetings of their respective PPs to further discuss and finalize project and implementation plans.

3.1.6 Estimated costs for CIMO's PP will fall into 3 categories; funding for meetings and planning sessions, CIMO support staff travel to participate in pilot and demonstration projects, and for contract support where needed if not supported through the project which CIMO is supporting. It is estimated that travel and contract support will account for the greatest expenditures. Meeting costs are estimated at 20,000 CHF. If support to other PPs includes activities such as instrument intercomparisons, there would be a need for outside funding sources since such are not fully accounted for in the current CIMO fiscal budget. Based on past experiences such an activity would require funding for pre- and post-activities needed to properly compare legacy instruments and systems with next generation instruments or systems. Depending on the scope of the intercomparison the costs could approach 250,000 CHF per intercomparison.

3.2 ***President's Meeting*** - At the request of the CIMO Ad-hoc WG Dr Nash presented the PP proposal at the 2008 Meeting of Presidents of Technical Commissions, February 18-20, 2008 conducted in Geneva, Switzerland where it had received full support. As part of their overarching discussions relating to WIGOS they addressed the CIMO PP and focused on phase 1 of the PP requesting the meeting review and comment on the draft CIMO TORs.

3.2.1 The Presidents considered the report and agreed that CIMO should continue to work together with the other commissions in elaborating its roles and responsibilities. WIGOS Pilot and Demonstration Projects would be used to test the feasibility of the proposals that had been presented to the meeting participants.

3.3 During the period March-July 2008 the second phase of the CIMO PP began with the CIMO Project Manager representing CIMO at three Ad-hoc PP meetings; the first meeting of the Ad-hoc CBS/CAS expert group to finalize the description of the Joint GOS-GAW PP for WIGOS, the Ad-hoc meeting for the JCOMM PP for WIGOS, and Ad-hoc meeting for the Integration of AMDAR into WIGOS.

3.3.1 ***GOS/GAW Meeting*** - The Joint Ad-hoc GOS-GAW Working Group (WG) to accelerate implementation of WIGOS/WIS met in Geneva, 25-27 March 2008. The Working Group addressed all aspects of the WIGOS/WIS programme. In doing so the group had to address how the GOS/GAW partnership would address the issues of technical specifications for interoperability with WIS. One of the primary goals of WIS is to launch a communications capability geared to establish and/or enhance interoperability among diverse data management systems.

3.3.1.1 The Ad-hoc WG reviewed three draft proposals for consideration under the overarching GOS/GAW PP. The group discussed the merits and goals of these activities and whether they were too ambitious for the PP. The discussions led to a consensus agreement that a draft final report on the meeting needed to be submitted to GAW Scientific Advisory Groups, World Data Centres and Expert Teams for review and comment on the these proposals before final PP plan and Implementation plans could be developed.

3.3.1.2 The Ad-hoc WG did reflect in its draft proposal identified CIMO as a likely key participant in their PP. It was also noted at the meeting that CIMO would play a role in activities noted in the latest GAW Strategic Plan.

3.3.1.3 **Current status:** awaiting GOS/GAW Implementation Plan completion. The plan will provide CIMO with a complete list of activities and tasks requiring CIMO collaboration. Once the plan is developed CIMO will designate its representatives in support of the Joint GOS/GAW WIGOS Pilot Project.

3.3.1.4 The Ad-hoc WG determined that funding over the period of the pilot project will likely require additional meetings and the option for contract support in addressing information collection and documentation. The early estimates called for funding needs approaching 120,000 CHF.

3.3.2 **JCOMM/IODE Meeting** - The ad hoc planning meeting for the JCOMM Pilot Project for the WMO Integrated Global Observing Systems (WIGOS) was held in Ostend, Belgium on 29 March 2008 at the kind invitation of the IOC Project Office for the International Oceanographic Data and Information Exchange (IODE). The aim of the Pilot Project is to promote and develop integration of marine and other appropriate observations into the global observing system through three core deliverables: (i) the integration of instrument best practices, (ii) development of interoperability arrangements between the ocean data systems and the WMO Information System (WIS), and (iii) the integration of quality management systems. The following elements address areas where CIMO could assist the JCOMM pilot project.

3.3.2.1 Development of standards and their wide acceptance within the meteorological and oceanographic communities was identified as important activity that will addressed by the Pilot Project. This links naturally with the development of a Standards process recently started by JCOMM and IODE and CIMO has been asked to play a partnered role in this activity of the PP.

3.3.2.2 The meeting addressed instrument best practices issues recognizing the need for traceability to agreed standards, and recommended to establish cooperation with the WMO and CIMO and to build on CIMO's experiences in areas such as instrument comparisons and regional instrument centres. The meeting proposed to explore establishment of one or more marine and oceanographic instrument centre(s) and reviewed the methodology proposed by CIMO for conducting instrument comparisons to ensure homogeneity, and compatibility of the observations.

3.3.2.3 The meeting agreed that the various related publications available via WMO and IOC needed to be reviewed and updated as required. JCOMM has also recently proposed to compile a catalogue of best practices to be eventually published as a JCOMM Technical Document. All related activities will be included in the Pilot Project plan. The meeting agreed to explore how JCOMM and ocean instrument comparisons could profit from the CIMO experience.

3.3.2.4 The meeting recognized the strong potential for synergies between the Ocean Data Portal (ODP) and the JCOMM Pilot Project for WIGOS; the meeting then proposed to establish a joint Steering Group with balanced representation from the IOC and WMO communities. The meeting asked that CIMO co-chair the steering group and CIMO accepted their invitation and agreed to act as co-chair with Mr Greg Reed, Executive Officer for the Australian Ocean Data Centre Joint Facility. Draft Terms of Reference and Membership for the Steering Group were outlined and would be finalized prior to the first meeting of the Steering Group to be held in September 2008.

3.3.2.5 The meeting agreed on an estimated cost of conducting the PP at 120,000 CHF. These funds would address meeting, travel and contractor costs, This amount does to take into account funding which may come from IOC and other sources.

3.3.2.6 **JCOMM/IODE Steering Group Meeting** - The meeting of the Joint Steering Group for the IODE Ocean Data Portal and the WIGOS Pilot Project for JCOMM was held in Geneva, Switzerland, from 18 to 19 September 2008. The aim of the meeting was to review the project plan, the draft implementation plan, discuss the business plan, address capacity building issues, and define the core deliverables of the WIGOS Pilot Project for JCOMM and the IODE Ocean Data Portal.

3.3.2.6.1 The meeting addressed instrument best practices and the development of better cooperation between JCOMM and CIMO, and with Hydro-Meteorological Instrument Industry (HMEI).

3.3.2.6.2 The meeting recommended that JCOMM Observing Panels and associated programs address the issue of documenting their best practices in light of the WIGOS developments. The strategic proposal called for the updating of the *WMO Guide to Meteorological Instruments and Methods of Observation (WMO-No. 8)* (CIMO Guide) to better integrate oceanographic issues. Future updates will be submitted through the JCOMM focal point on CIMO matters to the CIMO Focal Point for CIMO Guide.

3.3.2.6.3 The meeting proposed that instrument best practices related to surface meteorological and marine observations are included in the relevant chapter of the CIMO Guide while inviting JCOMM to consider developing similar best practices for the sub-surface observations as part of a separate chapter within the CIMO Guide or separate IOC document.

3.3.2.6.4 The meeting discussed establishment of marine instrument centres using CIMO regional instrument and radiation centres as a model. The meeting is investigating the feasibility of such a trial as part of the PP. The JCOMM Focal Point on CIMO matters was invited to review Regional Instrument Centre Terms of Reference and draft Terms of Reference for marine instrument centres as well as develop a proposal to be circulated to the Joint Steering Group for consideration and approval.

3.3.2.6.5 After further consideration the meeting stressed that the Pilot Project could not realistically achieve success without receiving appropriate funding for the coordination of the Pilot Project. The Steering Group urged the WMO and IOC to commit CHF 50,000 and CHF 30,000 in 2009 respectively, and CHF 30,000 and CHF 20,000 in 2010 respectively; an increase of CHF 60,000 from the earlier estimate for the final two years of the PP.

3.3.3 **AMDAR Steering Group Meeting** - The Ad-Hoc Steering Group Meeting on the WIGOS Pilot Project for AMDAR held its first session at the WMO Headquarters in Geneva, Switzerland, from 2 to 3 July 2008.

3.3.3.1 The Steering Group requested CIMO assist the AMDAR Panel with the intercomparison of AMDAR water vapour and other AMDAR sensors, such as temperature and wind speed and direction with other upper-air instruments with other upper-air instruments and systems.

3.3.3.2 The meeting suggested, as part of WIGOS Pilot Project, a preparatory meeting be organised to establish the requirements for a CIMO intercomparison of the AMDAR system. It was noted that maintenance and calibration issues were critical for ensuring the stability and sustainability of systems, and that work is needed to understand the various systems and components.

3.3.3.3 The meeting addressed other issues relating to data and information/product exchange (WIS interoperability) and Quality Management, Assurance, and Control issues. The designated CIMO representatives to the AMDAR WIGOS Pilot Project are Mr David Helms and Ms Magali Stoll.

3.3.3.4 The meeting addressed the issue of funding and determined that an amount of 210,000 CHF would support meetings, planning sessions, and contract support over the period of the pilot. However, if next generation water vapour sensor becomes operational and the Working Group opts to conduct an intercomparison, since much of the pre-planning will have been accomplished, an additional amount up to an estimated 250,000 CHF would be required.

3.3.4 ***CHy Pilot Project*** - The Ad-hoc planning group for the CHy WIGOS Pilot Project Hydrological Applications Runoff Network (HARON) has not been formed. The CHy approach detailed to CIMO at the meeting of the CIMO Ad-hoc WG by the CHy representative was that the earliest CHy would have their pilot project approved would be November 2008. The CHy representative to the September meeting of the ICT/IOSS did however, present the HARON proposal which will be reviewed and considered for approval at the November session of CHy.

3.3.4.1 CIMO is currently awaiting the decisions of CHy regarding their pilot project. CHy will meet in early November, 2008 to discuss and approve the project plan. It is anticipated that this will result in the creation of an Ad-hoc WG and formal project and implementation plans. Once accomplished CIMO Project Manager will meet with the CHy Project Manager to begin a dialogue on how CIMO could assist CHy with its PP.

3.3.4.2 On August 29, 2008, CHy prepared an update to their pilot project indication the pilot project would require 5 years for full implementation at the cost of 9 million Euros if all phases of the project were to be completed. The November meeting of CHy should determine and announce an update to the initial proposal and to insure that the proposal addresses the three levels of WIGOS integration.

4. *CIMO Implementation plan*

4.1 The implementation plan addresses the three phases of implementation, their core deliverables, activities, and sub-tasks; while providing detailed information on actions proposed to implement the plan. The plan also identifies individuals or teams responsible for undertaking CIMO related activities and tasks in support of WIGOS partner Pilot Projects, as well as timelines and estimated costs related to PP implementation.

4.2 The final CIMO implementation plan drafting process will be highly dependent on the other pilot project plans for details on activities, tasks, timelines, and costs involving CIMO. It is for this reason the Implementation Plan remains in an outline form until the details of CIMO's involvement are finalized within the respective pilot partner implementation plans. Success with this approach will validate CIMO's underpinning role and responsibilities to constituent observing systems as defined in level one of the WIGOS Integration process; to attain sustainability through optimization of an end-to-end system embracing the concepts homogeneity, interoperability, and compatibility through standardization and traceability of observations.

4.3 Implementation components of the program include:

- Support the implementation of guidelines and recommendations provided by CIMO and other relevant bodies to ensure enhancement of the quality and long-term stability of observations and measurements of meteorological and related environmental variables under the WIGOS framework in support of operational applications and research;
- Promotion of technology transfer and capacity building activities in the field of instruments and methods of observation through technical conferences and training workshops.

5. Deliverable 1 – Reaching out to Partners

5.1 CIMO will reach out and initiate a dialogue with each of the pilot project teams and to begin the process of determining whether CIMO capabilities and experiences with instruments and methods of observation could assist in meeting project needs and goals. This is a key element of Phase one of the CIMO Project Plan.

6. Deliverable 2 – Active Participation by CIMO in Project Planning

6.1 Collaborate with each project in identifying CIMO capabilities required for achieving targeted goals and deliverables of each respective project. The end result would be to draft CIMO targeted activities and tasks into each of the respective implementation plans. Once this process has been completed the detailed CIMO implementation plan can be completed reflecting CIMO and partner focused activities and tasks.

6.2 The purpose of the IMOP is to set technical standards, quality control procedures and to provide guidance for the use of meteorological instruments and observation methods with the following objectives:

- to promote development, documentation and world-wide standardization of meteorological and related geophysical and environmental instruments and methods of observation to meet agreed user needs for data; and to ensure the effective and economic use of instruments and methods of observation under varying working conditions and in differing technical infrastructures, by providing technical standards, guidance material, performance specifications, technology transfer and training assistance.

7. Deliverable 3 – Meeting Partner Expectations

7.1 Once CIMO target capabilities are integrated into the various implementation plans CIMO will provide experts to work with programme experts of each project.

7.2 CIMO will target its capabilities at assisting in the setting of instrument technical standards, instrument/system quality control procedures and to provide guidance on observation methods for instrument/system siting, operation and maintenance.

7.3 CIMO will assist in developing technical standards, providing guidance materials; assist in the setting of performance specifications, promoting technology transfer and training. All CIMO provided assistance will guide partners toward achieving instrument and methods of observation related project activities and goals.

8. Capacity Building

8.1 In terms of Capacity Building, the Pilot Project will focusing on assisting partners in the development of training materials and their delivery. Training would encompass such topics as metrology, technology transfer and capacity building activities in the field of instruments and methods of observation through technical conferences and training workshops.

9. Next Meeting of the CIMO Ad-hoc WG

9.1 The next meeting of the CIMO Ad-hoc WG is scheduled for November 24 and the morning of November 25 in St. Petersburg, Russia.

The CIMO Pilot Project on WIGOS
“Elaboration of the underpinning/crosscutting role and responsibilities of the Instruments and Methods of Observation Programme and CIMO in the context of WIGOS”

Project Name	Elaboration of the underpinning / crosscutting role and responsibilities of the Instruments and Methods of Observation Programme and CIMO in the context of WIGOS
Acronym	N/A
Project Type	Pilot
Project Status	<p>Phase 1: of Pilot Project planning and implementation is nearly completed. CIMO has actively worked with each of the Ad-hoc working groups except for CHy. Planning and implementation is currently in various stages with GOS/GAW, AMDAR and JCOMM and as soon as CHy completes its initial planning and confirmation of its pilot CHy and CIMO can begin its dialogue addressing the CHy Pilot Project and how CIMO might provide assistance. This awaited meeting will likely not take place prior to the WIGOS/WIS Subgroup meeting scheduled for November.</p> <p>Phase 2: is underway with the three remaining pilot projects. At these meetings each program addressed how CIMO could assist each in meeting the goals of their respective pilot projects. Each meeting resulted in identifying activities and tasks in which CIMO could provide the necessary assistance to complete the requisite activity/task. The pilots are currently at different stages of development; JCOMM has fully developed its implementation plan and will be seeking JCOMM and IOC approval. The AMDAR and GOS/GAW pilots are in the process of drafting their implementation plans.</p> <p>Phase 3: support activities will commence once each implementation plan has been finalized and approved. Due to the advanced nature of the JCOMM plan CIMO and JCOMM representatives have initiated work on several activities.</p>
Project Overview	This Pilot Project is directed at defining the CIMO's role and responsibilities within the WIGOS framework. Once these proposed roles and responsibilities (Terms of Reference (TOR)) are endorsed by the EC-WG-WIGOS/WIS and Sub-group on WIGOS, the proposal will be tested and demonstrated across the remaining WIGOS Pilot and Demonstration Projects to validate the effectiveness of the proposed TOR in addressing the WIGOS needs.
Project Aims	<p>Phase 1: of this project is to elaborate the underpinning / crosscutting roles and responsibilities of the CIMO in the WIGOS (TOR for CIMO in the context of WIGOS).</p> <p>Phase 2: of this project will involve meeting with the remaining four pilot project ad-hoc working groups.</p> <p>Phase 3: of this project is to develop and implement a plan which demonstrates the process by which CIMO fulfils it's newly, EC-agreed upon roles and responsibilities within the WIGOS framework. It will also address CIMO's collaborative activities with pilot projects and select demonstration projects.</p>

Partners / Participants	<p>Phase 1: All WMO Technical Commissions, Co-sponsored Programmes and related International Organizations.</p> <p>Phase 2: Selected WIGOS Pilot & Demonstration Projects relevant to the CIMO-Pilot Project.</p> <p>Phase 3: Selected WIGOS Pilot & Demonstration Projects relevant to the CIMO-Pilot Project.</p>
Funding Source(s)	The three phases of this project will, to the maximum extent possible, make use of the expertise to be provided through the working structure of the CIMO and its WIGOS partners. Additional support will be required through the WMO budget and / or WIGOS-WIS Trust Fund.
Project Timescale	<p>Phase 1: Pilot Project proposal for the role of the CIMO within the WIGOS and draft implementation plan development: fourth quarter 2008.</p> <p>Phase 2: Meet with each of the Pilot Project groups to determine the CIMO's role with each Pilot Project: fourth quarter 2008.</p> <p>Phase 3: Implementation: 2009-2011.</p>
Expected Key Deliverables	<p>Phase 1: Proposed CIMO TOR within the framework WIGOS and draft proposal for implementation.</p> <p>Phase 2: Project approval and implementation and management, periodic evaluation and reporting of lessons learned and the documentation as well as tracking of recommendations and actions.</p> <p>Phase 3: Complete collaborative efforts with all pilot and demonstration projects to insure the delivery of pilot and demonstration objectives with which CIMO has been asked to participate.</p>
Project Links	TBD Developed
Project Summary	The Commission shall be responsible for matters relating to international standardization, compatibility and sustainability of instruments and methods of observation of meteorological, climatological, hydrological, oceanographic, and related geophysical and environmental variables.
Date of Last Update	10/20/2008
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Role and Responsibilities of the Commission for Instruments and Methods of Observation (CIMO) within the framework of the WMO Integrated Global Observing Systems (WIGOS)

Within the framework of the WMO Integrated Global Observing Systems (WIGOS),

The Commission shall be responsible for matters relating to international standardization, compatibility and sustainability of instruments and methods of observation of meteorological, climatological, hydrological, oceanographic, and related geophysical and environmental variables.

This responsibility underpins all observations within the WIGOS, and will be carried out in close consultation with relevant WMO partner organizations that co-sponsor, own and / or operate some of the observing systems.

This shall include in particular (priority to be defined at later stage):

- (a) Addressing the requirements across all elements of WIGOS for standardized and compatible observations, including data content, quality and metadata;
 - (b) Providing advice, studies and recommendations concerning effective and sustainable use of instruments and methods of observation, including methods for testing, calibration and quality management consistent with the WMO Quality Management Framework;
 - (c) Conducting and / or coordinating global and regional field intercomparisons and functional testing of instruments and methods of observation;
 - (d) Promoting the development of measurement traceability to recognized international standards, including reference instruments and effective hierarchy of world, regional, national and lead centres for instrument calibration, development and testing;
 - (e) Promoting compatibility, inter-calibration, integration and inter-operability with respect to both, and between, space-based and surface-based (*in situ* and remote-sensing) observations, including conducting test bed observing experiments;
 - (f) Encouraging research and development of new approaches in the field of instruments and methods of observation of meteorological, climatological, hydrological, oceanographic, and related geophysical and environmental variables;
 - (g) Promoting the appropriate and economical production and use of instruments and methods of observation, with particular attention to the needs of developing countries; and,
 - (h) Supporting training and capacity-building activities in the area of instruments and methods of observation.
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