



5.3 RECOMMENDATIONS OF THE EXPERT TEAM ON CAPACITY DEVELOPMENT THROUGH WMO TECHNICAL DEPARTMENTS (CDP-ET-TDS)

5.3(1) Recommendations from CDP-ET-TDs for inclusion in the report of chair to EC-73

Based on the contributions provided by the members of the CDP-ET-TDs several recommendations and relevant issues to be considered were gathered. Some are listed directly in Item 5.3 (2) for consideration by the CDP-TT-CDS.

1. The Services Department recommended certain areas of work that the CDP could be instrumental such as: guiding peer reviews of the Member capacity baseline data, perhaps through the RAs, and developing a system of WMO capacity certification to complement the ISO certification of which some Members are already availing.
2. Based on INFCOM and SERCOM contributions, there could be a need for a review, or update, of some of the current competency frameworks, in coordination with the ETR, in order that they reflect requirements for expected competencies in new or emerging technologies as they reach sustainable operational status.
3. INFCOM to consider, in coordination with ETR, the development of a CD framework to support the implementation of systems under its purview.
4. Approaching academics and NMHSs staff to encourage new venues where research ideas and results can be shared to increase awareness of potentially operationally-useful results. The CDP may develop strategies to foster engagement at the local/regional level by close communication with the member's host institutions.
5. There needs to be a systematic contribution from University components to strengthen training for NMHS personnel and continue work in research-to-operation. Monitoring examples from research institutions that have made significant contributions to CD in climate forecasting, including them through Climate Outlook Forums and training of skilled personnel able to access, interpret and translate climate information into decision-relevant products and services.
6. To improve the link between RTCs and Education and Training Collaborating Partners with regional projects which have available funds, so that the training component is considered at early-stage of the project.
7. There is an overall need for technical personnel in instruments. Particular priorities include the CD for the implementation and operation of the Antarctic RCC-Network. The interaction with the GOOS regional alliances and CD activities under this framework will be central, since it is one of the pillars of regional action.
8. Another important area is the building of regional research and CD in hydrology, meteorology and climate sciences. Collaborative development of solutions and communication with other Regional Centres such as WIGOS, GTS, WIS, etc. is necessary to coordinate the training in those fields.
9. There is a need to ensure the availability of training activities in various languages. An example for this particular CD gap is the collaboration with GAWTEC for the provision of training in Spanish. This example is a good practice to be shared and may be replicated

for other regions. Being able to bring these trainings in the region's native language would cover an important gap in terms of technical capacity and language barrier.

10. There is a need for collaborations between program related training (e.g. GAWTEC) with those responsible for training (such as RTCs and RICS). This link is crucial to cover the deficiencies that exist in terms of technical knowledge. The CDP could be instrumental in fostering these interactions.
11. There is a need that more experts be part of the development of training (as Subject Matter Experts). Particular emphasis to be placed on developing partnerships with academic institutions and professional and scientific associations, including exchanges of academic staff. Pool of well-trained meteorologists must be supplemented by another interdisciplinary pool of professionals who understand climate and can work with specific climate-sensitive sectors. (eg agricultural meteorology, health). For this aim, there needs to be an effective communication procedure between the different actors in the RAs and RTCs. This could be an opportunity to further promote the WMO Global Campus, the LEARN Portal, Train the Trainer opportunities and other learning resources and communities such as CALMet Commons.
12. There is a need to enhance communication of meteorological and climatological information to different stakeholders in the language and style that they will understand.

5.3(2) Recommendations from CDP-ET-TDs for consideration by the Task Team on WMO Capacity Development Strategy

The recommendations included in Item 5.3(1) are key elements to be considered in line with the update of Capacity Development Strategy and Implementation Plan (CDSIP). It is necessary that all Technical Commissions follow-up and help in the review and update of the CDSIP undertaken by the CDP-TT-WCDS, and the CDP-ET-TDs can be instrumental in gathering their contributions and suggestions.

Given the advancement of emerging technologies and available data portals, there is a need for increasing competencies in areas such as access to databases, and promoting workshops on how to use that data. The development requirements are very different depending on the geographical region they come from (developing countries vs developed countries). There is a need to change the paradigm and think not only in terms of capacity development but also in capacity recognition (at individual and institutional level). Some recommendations to be included based on the Research Board representative member contributions, are listed below:

Recommendation 1: To target programmes taking into account what kind of capacity development is needed and, especially, for whom and by whom.

Recommendation 2: To assess what is being done and by whom, putting more emphasis on the different regions. It is relevant to gather this information in a database.

Recommendation 3: To foster the vertical integration of capacity recognition, not only at the individual level but also there is a need to enhance the recognition of institutional capacity. Enhance institutional intercommunication promoting levels of trust among the different entities.

Recommendation 4: Capacity development for students and Early Career Researchers (ECRs) is needed, independently of the region. Along with better funding opportunities and research facilities, the engagement of ECRs from developing countries can be further improved with the identification of science questions of regional importance wherever it is feasible. Moreover, funding agencies are proportionally looking for proposals of applied nature with potential to solve local/regional problems instead of fundamental scientific research. Young scholars/scientists are to be encouraged to become aligned with the [YESS community](#) and other ECRs networks.

There are several **good practices** yet to be shared and these could be included as case studies in the CDSIP updated version. Below the MFI support for NMHSs from developing countries is described as a concrete example of successful modernization projects, though other partnerships and cooperation agreements must still be identified in the course of the ongoing CDSIP update by 2022.

The MFI ([Meteo- France International](#)) supports NMHSs from developing countries. Since mid-2016 the MFI has initiated several significant agreements: a memorandum of understanding with the Bolivian Ministry of Environment and Water (MMAyA) and the National Service of Meteorology and Hydrology (SENAMHI) in Peru, in order to validate a bilateral cooperation for the modernization and the strengthening of the national meteorological infrastructure, information systems and enhancement of service capacity. Another agreement was signed with the Civil Aviation Directorate of Paraguay in charge of supervising the National Meteorological Service. A third agreement was signed between MFI, Météo-France and the National Meteorological Service (SMN) of Argentina. This has facilitated SMN implementation of a modernizing project with the acquisition of MFI's PWS / EWS (Public Weather Service / Early Warning System) solution, METEOFACORY®. The Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG) has engaged with MFI in a vast modernizing process of its infrastructures and organization, and visible outcomes have been delivered in the fields of meteorological observation, integrated information systems, PWS and warning capability. MFI and the ASECNA (Agency for Air Navigation Safety in Africa and Madagascar) have been collaborating with innovation and capacity building in line of sight. This partnership agreement has facilitated their common efforts to improve the quality of the meteorological assistance to air navigation. Some of the CD strategies include training programs, sharing of expertise in collaboration with Météo-France and other consultancy and engineering services to pursue the development of ASECNA's capacities. The latter examples of cooperation could be shared as good practices given that such agreements provide support for implementing ambitious integrated modernizing projects while sharing of the know-how and solutions of Météo-France. Under the framework of WMO Global Multi-hazard Alert System (GMAS) is that the Early Warning Systems (EWS) are strengthened and sustained.

The WMO play an important role in fostering and helping with its instrumental support on resources mobilization, partnerships and development assistance. It is recommended the promotion of NMHSs CD through "twinning" services, training and support through regional cooperative entities (such as RCCs networks, or by partnering with other NMHSs or specialist institutions to share capabilities, skills, data and/or resources. Such international support is most effective and sustainable: there is a national framework under which the support is provided. WMO helps Members' NMHSs to support others by transferring funding to them through Letters of Agreement. Closer collaborations are encouraged between external funding agencies and NMHSs in the region towards achieving the desired increase.