SYMET Thematic Paper I

Service-specific education and training needs

(Note: All numbered WMO documents are available at https://library.wmo.int/opac/)

1. Introduction

One of the missions of WMO is to promote the application of new science and technology in operational meteorology, climate services, hydrology, and related service areas to enhance Members' capabilities to meet their responsibilities to better serve and safeguard populations and their activities. It does this through collaborative development and implementation of innovations by the WMO Technical Commissions and the Secretariat Technical Programmes, and by establishing standards of improved practices through competency frameworks and guidance material. Implementation includes the coordination required to meet the education and training requirements these innovations bring about. In addition to addressing innovations, WMO also develops educational guidelines for foundational qualifications and service-area competency standards.

Ultimately, through education and training opportunities aligned with these innovations and standards, the personnel within WMO Members' services will be better equipped to meet evolving service needs.

This thematic paper is offered to increase awareness of WMO initiatives and standards with significant impacts for education and training providers, offer a structure on the implementation of training in their support, and to generate discussions leading to recommendations for effective ways facilitate their diffusion into courses and curricula.

2. Situational Analysis

In recent years, WMO members have agreed to focus attention on several key initiatives that are deemed necessary to strengthen Members' services and enable developments for continued and increased effectiveness of NHMSs into the future. The list below briefly describes a few of the broad initiatives and their impacts for education and training providers. In addition to these emerging learning needs to address service improvements, ongoing core training for basic qualifications and skills must also continue.

2.1 WIGOS

The WMO Integrated Global Observing System (WIGOS) is a framework for integrating all WMO observing systems, as well as co-sponsored systems, into a common regulatory and management structure. The goal is to achieve full interoperability of data from all sources, e.g. those describing weather, water, climate, air quality, oceans, cryosphere, and water resources. This potential has come about through advances in observing

technologies and telecommunications, and new mechanisms for data management, metadata standards, and quality monitoring. This synergy will reduce budget pressures by making more data available through dissolving boundaries between organizations, disciplines, and technologies. Through WIGOS and improved numerical models and data assimilation, services for user decision making will be greatly enhanced. Key components of WIGOS implementation are the WIGOS Data Quality Monitoring System (WDQMS) and the OSCAR/Surface (Observing Systems Capability Analysis and Review tool) and OSCAR/Space systems for cataloguing observations metadata. Each of these has planned training initiatives to prepare people for using the metadata and tools required for establishing the WIGOS. In addition, and in concert, directors of NMHSs need to learn the impacts of WIGOS, OSCAR, and WIS on operations to ensure effective implementation. *Related to*: WIS, S/GDPFS. (See WMO Manual on WIGOS, WMO-No. 1160)

2.2 WMO Information System (WIS)

The goal of the WIS is to rapidly integrate real-time and non-real-time (archive) data to better interpret weather events in a climatologically context, to better integrate data from all observation sites, to harmonize data formats, transmission standards, archiving and distribution mechanisms in support of inter-disciplinary use of data and products, to establish standard practices for collection, electronic archival and exchange of metadata, and to provide industry standards for protocols, hardware and software. Training providers should look to infuse WIS processes within their existing and future courses to. *Related to*: WIGOS, S/GDPFS. (See Manual on WMO Information System, WMO-No. 1060 and Guide to WMO Information System (WIS) WMO-No. 1061)

2.3 Impacts-based Forecasting and Warning Services

While traditional weather forecasting focused on describing expected weather conditions, impacts-based forecasting goes a step further to provide information on the impacts of associated hazards and how to ensure safety and protect property. Such information allows users of forecasts and warnings to take effective action. Impacts-based forecasting applies to all ranges of forecasts, from nowcasting, to short-range, to the medium- and long-range, in both weather and climate applications. The changes in operational practices brought about by impacts-based approaches introduce training needs in the understanding of impacts for various users, impact thresholds of various hazards, methods for coordinated warning delivery to ensure consistent messages, use of the Common Alert Protocol, forecast communications with graphical products depicting hazard areas and levels, developing customized products that might merge weather and other data, communication of uncertainty, and other customer-driven modes of communication. Involvement in the development of warning response plans with other responsible organizations is also required. *Related to:* S/GDPFS, MHEWS. (See WMO Guidelines on Multi-hazard Impact-based Forecast and Warning Services, WMO-No. 1150; Guidelines on Early Warning Systems and Application of Nowcasting and Warning Operations, WMO/TD No. 1559; and PWS, 27. Guidelines for Implementation of Common Alerting Protocol (CAP)-Enabled Emergency Alerting, as well as http://www.wmo.int/pages/prog/amp/pwsp/publications_en.htm)

2.4 Multi-hazard Early Warning Systems (MHEWS) and Disaster Risk Reduction

The concept of Multi-hazard Early Warning Systems is a shift away from a reactive response to weather, climate and other natural disasters to one that includes preparedness and preventative strategies to analyse and reduce risk. Four components of effective early warning systems include:

1) detection, monitoring and forecasting the hazards;
2) analyses of risks involved;
3) dissemination of timely and authoritative warnings; and
4) activation of emergency plans to prepare and respond.

In addition, there is a need to coordinate each of these components. While traditional training goals related to detection, monitoring and forecasting hazards are still valid, new training needs arise related to impacts-based forecasting and warnings (see 2.3 above). In addition, capacity for risk analysis and collaboration with emergency response agencies in developing plans and response mechanisms is needed. An example of a developed training programmed related to component (1) is the Flash Flood Guidance System Training Programme (http://www.wmo.int/pages/prog/hwrp/flood/ffgs/training.php). *Related to*: Impacts-based Forecasts and Warning Services, Climate Services. (See https://www.wmo.int/pages/prog/drr/projects/Thematic/MHEWS/MHEWS_en.html, https://public.wmo.int/en/programmes/disaster-risk-reduction-programme, including the DRR Roadmap)

2.5 Seamless Global Data Processing and Forecast System (S/GDPFS)

GDPFS describes the world-wide network of operational centres operated by WMO Members. The GDPFS, which relies on WIGOS and WIS, is made up of Global, Regional, and National-level Centres that produce a variety of products related to weather, water, climate, and environment. This is done by

a) sharing high-quality data, products, and services,
b) seamless integration of products at all spatial- and temporary-resolutions (i.e., both weather and climate models), and
c) smooth translation of weather and climate extremes and their mutual influences to impacts and mitigation strategies.

The S/GDPFS will greatly enhance impact-based and risk-based warnings. Seamless processes are important because, to users, the distinction between weather, climate, and environment are less important than impacts, and because overlap exists in their methodological approaches and content. Seamless prediction creates a shared infrastructure, so that weather and climate forecasts improve hand-in-hand. It also ensures that research is more seamlessly transferred to operations.

The seamless nature of the GDPFS will necessitate training to develop skills in utilization of NWP (including underutilized ensemble products) and remote sensing products that enhance the forecast process for impacts-based forecasting at all time scales, and assimilation of global and regional NWP data for local area modelling where necessary. *Related to*: Impacts-based forecasting and warnings, WIGOS, WIS. (See Manual on GDPFS, WMO-No. 485, revised)

2.6 WMO Service Delivery Strategy

The WMO Service Delivery Strategy has been developed to offer existing and emerging weather, climate, water, and environment services the standards necessary for offering high quality services that meet the needs of their customers. It includes movement towards a service- or customer-oriented culture and the implementation of quality management approaches. The recommended development and delivery processes and their components are succinctly depicted in the illustration below:

Because the Service Delivery Strategy is based on an impacts-based forecasting model, many of the training needs that arise overlap with those described above in 2.3, including understanding of needs and impacts for various users, as well as the impact thresholds of various hazards and good forecast communications. Moreover, the strategy calls for increased capacity in programme evaluation and monitoring, quality management practices and QMS implementation, and methods for developing and maintaining partnerships. *Related to*: Impacts-based forecasting and warnings, S/GDPFS. (See The WMO Strategy for Service Delivery and Its Implementation Plan, WMO-No. 1129 and Guide to Public Weather Services Practices, WMO-No. 834. Also see https://library.wmo.int/opac/index.php?lvl=etagere_see&id=41#.WUzbjuQSgjY)

2.7 Climate Services

The Global Framework for Climate Services (GFCS) intends to provide a worldwide mechanism for coordinated actions to enhance the quality, quantity and application of climate services. Capacity Development is the fifth of five pillars, but it is a cross-cutting one that enables the implementation of the other four, including

1) User Interface Platform (training on interactions with users),
2) Climate Services Information System (training on using tools and climate information sources),
3) Observations and Monitoring enhancements (training in observations and data management), and

4) Research, Modelling, and Prediction infrastructure.

Research and model development and validation will need to be conducted by a well-educated research community, and the additional pillars will require a competent operational workforce with specialized skills and knowledge developed for this substantially new and evolving service area. The approved Competencies for Provision of Climate Services, will guide the latter. These competencies include

1) Create and manage climate datasets,
2) Derive products from climate data,
3) Create and/or interpret climate forecasts, climate projections and model output,
4) Ensure the quality of climate information and services, and
5) Communicate climatological information with users.

Training is required in each of these areas, and implementation will additionally require targeted training for providing services to specific user communities and industry sectors, as well as larger scope training that aids countries to develop national frameworks for climate services. Special attention will need to be paid to critical users of climate information such as agriculture, water resources, and disaster risk reduction. Climate services has relationships to each of the other innovation areas. (See WMO Guide to Climatological Practices, WMO-No. 100, Guidelines on Capacity Development for Climate Services [in preparation], and Guidelines for the Assessment of Competencies for Climate Services Provision [in preparation].)

2.8 Hydrology and water resources

All of the above initiatives have a clear hydrological component. In addition to above, needs that have been specific to the National Hydrological Services (NHSs) are related to:

- hydrological seasonal prediction based on climate outlooks;
- the selection, operation and maintenance of the appropriate hydro-acoustic instrumentation for streamflow and sediment measurements;
- hydrological data sharing;
- and the development of Quality Management Systems (QMSs) for NHSs.

2.9 Emerging and related service areas

While the above represent broad-scale changes in service delivery, improvements in practices in many existing and increasingly important areas call for specialized training.

- The Global Atmospheric Watch (GAW) programme has developed guidelines and procedures for making observations and predictions of a number of atmospheric composition variables, and has developed analysis and modelling tools. These observations and applications are critical for helping reduce societal risks from climate change, urban air pollution, ecosystem and agricultural impacts, and high-impact weather and events. They also support environmental conventions and treaties. WMO GAW Measurement Guideline Reports that can support training, as well as the GAW Implementation Plan (WMO-No. 228) are available at the WMO E-Library. (For example, see https://library.wmo.int/opac/index.php?lvl=notice_display&id=19823#.WW8am-QSgjY)

- Since 2006, the Severe Weather Forecast Demonstration Project (SWFDP) has been helping developing countries improve forecasts and warnings of severe weather, improving lead-times and reliability for alerts and warnings for high impact events such as heavy precipitation, strong winds, and high waves. The SWFDP employs a cascading forecast process made possible by the S/GDPFS, and integrated MHEWS and Impacts-based forecast and warning services principles, and collaborates with the Public Weather Services programme. *Related to*: Impacts-based forecasting and warnings, S/GDPFS, MHEWS, and Climate Services. (See Guidebook on Planning Regional Subprojects, available at http://www.wmo.int/pages/prog/www/swfdp/.)

- The Global Cryosphere Watch programme has been formed due to the increased attention given the cryosphere as a useful indicator of climate variability and change, and its impacts to transportation, infrastructure, wildlife, and recreation. Training is needed on improved cryospheric monitoring and integration of the resulting data into the WIGOS. (See WMO Global Cryosphere Watch Implementation Plan, https://library.wmo.int/opac/doc_num.php?explnum_id=3538)
- Integrated Urban Hydrometeorology, Climatology and Environment Services is growing in importance due to the fact that 50% of the world's population lives in urban areas, and will likely increase to 70% by 2050. Guidelines in this area were called for by an EC-69 decision. Training will be required in areas such as micrometeorology, boundary layer meteorology, surface based observations, and atmospheric pollution processes in urban environments.
- Sand and dust storms monitoring and prediction remains a priority area for research and training to contribute to risk reduction for many WMO Members. The Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) mission is to achieve comprehensive, coordinated and sustained observations and modelling capabilities of sand and dust storms to improve monitoring and enhance dust prediction capabilities.
- In addition, traditional service areas require updated training. Examples include
    - recent Aeronautical Meteorology competency requirements,
    - next-generation satellite skills,
    - changes in NWP capabilities,
    - including ensemble prediction systems,
    - radar training for developing countries obtaining new systems,
    - quality management systems for NMHSs, and
    - management training for NMHS managers.
- Underlying many services areas are also the Basic Instructional Packages (BIP) that describe the curricula required to meet WMO-defined basic qualifications, such as WMO Meteorologist, Meteorologist Technician, Hydrologist, and Hydrologist Technician. These are also reviewed on a regular basis, and in the case of Aeronautical Meteorology Forecasters, the BIP-M represents and new international requirement.
- Continued research in these emerging areas will require a growing pool of scientists educated to perform research that can inform service enhancements in the areas mentioned in this section, including research on new operational products and methods.

2.10 WMO Competency Frameworks

The World Meteorological Congress (CG-16) has requested the WMO Technical Commissions to place a high priority on developing the competency requirements for the core job-tasks in their areas of specialization and to incorporate these activities into their work programmes in the 2012 to 2015 financial period. By 2018, the number of competency frameworks approved by Executive Council is expected to grow to 15. Additional frameworks are in planning. Adoption of the competency frameworks will require efforts at the national level. Table 1 provides a list of service areas with approved or very mature frameworks, as well as supporting or enabling knowledge and skill frameworks.

Competency Frameworks	Aeronautical Meteorology (2 frameworks, approved) Public Weather Services (5, in revision) Marine Weather Forecasters (approved) Climate Services (approved) WIS (approved) Education & Training Providers (approved) Observation Systems (4, not approved) Hydrology (in preparation)
Knowledge and Skill Frameworks (Enabling skills)	Satellite Observations (approved) NWP Data and Products (in review) Radar Observations (in review)

Table 1: WMO Competency Frameworks

The implementation of competency frameworks require efforts to

1) adapt the framework to local climatological conditions, regulations, requirements, and procedures,
2) putting in place a national competency assessment programme,
3) developing competency-based training processes to fill gaps, and
4) creating competency documentation that supports institutional quality management practices.

The implementation of competency frameworks itself creates training needs, and WMO has anticipated these needs through the introduction of a WMO Guide on Competency (in preparation). However, even more critical is a need for training institutions to become thoroughly familiar with the frameworks in the areas for which they have training responsibilities and to modify their curricula and courses to be in alignment with the frameworks. In this way WMO Members can be assured that all training that is conducted leads to learning outcomes for participants that relate to international standards and recommended practices. In addition, links to the frameworks should be clearly defined in the course descriptions and announcements, and documented in certificates. Accordingly, the WMO Global Campus initiative is requiring, when applicable, metadata describing the competency framework and competency units addressed in the events that will advertised in the WMOLearn Events Calendar and the resources collected in the WMOLearn Learning Resources Catalog. (See the WMO Guide on Competency (In preparation), WMO Technical Regulations (WMO-No. 49), https://www.wmo.int/pages/prog/dra/etrp/competencies.php, and WMOLearn at https://public.wmo.int/en/resources/training/wmolearn)

3. Challenges, trends, and emerging issues: A general process for implementation of current innovations

All training providers for WMO Members are critical partners in the implementation of the initiatives being driven by the Technical Commissions and guided by the Secretariat technical departments. The following process is suggested for implementation of the new and updated training courses and programmes being driven by the initiatives outlined in section 2. The elements are similar to those in the training cycle described in the WMO Guidelines for Trainers in Meteorological, Hydrological and Climate Services, WMO-No. 1114, and depicted below. As shown in the diagram, the elements are not a prescribed sequence, but systemic.

Figure 1: The Training Cycle

3.1 Awareness of standards and guidance material

Becoming fully aware of the appropriate guidance material produce by WMO is the first step to successful implementation. This includes the Technical Regulations (WMO-No. 49), WMO Guides, Manuals, Guidelines, and Competency Frameworks. Responsibility for detailed knowledge of their contents can be distributed among appropriate personnel. Currently, this guidance material is available in a variety of locations on WMO Websites and accessible through the WMO Library online. However, SYMET might want to consider recommendations on improvements to communication and accessibility to guidance material. (Steps 3.1-3.3 are part of the continuing analysis of the organizational context.)

3.2. Reviewing WMO implementation strategies

The initiatives describe in section 2 are likely linked to strategies proposed either in the guidance material itself, or in the decisions reported in the WMO Executive Council and Congress papers. The strategies might include recommended course topics, training events or resources, and modes of delivery. WMO ETR will endeavour to make RTCs and SYMET participants aware of these initiatives as they become available. SYMET participants may have recommendations in regards to dissemination of implementation strategies as well.

3.3 Review and adaptation of the relevant competency frameworks

Awareness of the competency frameworks is just the beginning. As mentioned in section 2.9, a key step in the process is to review the relevant competency framework(s) and adapt them to national or regional needs, and then to adapt training curricula and training plans to address the learning outcomes suggested in the frameworks. Comparing the contents of the frameworks, including both top-level and second-level information, to existing or planned courses and resources, will help ensure compatibility and regional appropriateness.

3.4 Training needs assessment

WMO guidance and competency frameworks go a long way in defining training needs as they reflect the goals agreed to by WMO Members. However, regional and local needs assessment will help to prioritize those needs based on current levels of performance and available infrastructure. For new personnel entering into service, training needs will be more extensive, perhaps beginning with an assessment of the extent to which basic qualifications have been reached.

National needs are easier to identify, but still require substantial effort. National needs can be uncovered by examining performance records, education and training records, feedback from customers, and training requests by staff and supervisors, as well as national needs assessment surveys. Providers of training for regional audiences can review national needs assessment results, if available, and needs assessments conducted by the WMO Secretariat or Regional Associations. They can also conduct new, focussed needs assessments in specific service areas with countries typically served, include questions about training needs in course nomination forms to adapt courses proactively, and use post-course evaluation forms to guide future course planning.

3.5 Developing learning pathways

The path to expertise most often requires many steps, and a professional development curriculum path composed of multiple learning opportunities may be needed to bring learners to desired levels of performance. A curriculum path may include a series of courses, or a blend of self-directed learning using online learning resources in conjunction with classroom courses and follow-up on-the-job experiences or ongoing connections with online communities of practice, which could extend regionally or globally.

3.6 Identify learning solutions, including alternative methods

Professionals learn their skills in a wide variety of ways, but when creating training plans, too often these can be forgotten as potential modes of professional development. The WMO Secretariat is current suggesting an increasing variety of approaches to meeting Members' training needs in cost-effective ways. These include:

- Traditional face-to-face courses focused on information sharing
- Courses with increased workshop components (higher ratio of practical sessions)
- Distance learning courses that are time-constrained and instructor-led

- Distance learning courses and online resources to be used in self-directed ways and to augment other forms of training
- Blended combinations of face-to-face events and distance learning events and resources
- Fellowships for longer-term training opportunities
- Regional training desks and other forms of on-site coaching for long-term periods of a few weeks to months
- Training of trainer approaches to prepare experience trainers to disseminate good practices through their local training activities
- Roving seminars in which the required travel is limited to trainers and nearby participants
- Regional weather briefings conducted remotely by regional centres in support of the NMHSs in their region
- Training weeks composed of a series of topic-focused Webinars
- Experiential learning approaches such as participation in special projects, special assignments and secondments, etc.

Often, a combination of these is required to reach the intended learning outcomes, and for providing flexible pathways for learners and institutions.

3.7 Developing training plans, including activities and assessment methods

Effective training outcomes require planning for activities for practicing skills and receiving feedback, and methods for conducting both formative (mid-course) and summative (end-of-course) assessment. Using a process that begins with well-defined needs and learning outcomes, a useful training plan will include a definition of scope, analysis of constraints, justification of learning solutions, an assessment plan, course evaluation plans, learning activities mapped to the learning outcomes, and specification of the human and technical resources required, as well as time constraints and milestones. (See The Trainer Resources Portal at http://etrp.wmo.int/moodle/course/view.php?id=30 .)

3.8 Conduct impacts evaluation

Without some level of investigation on the longer term outcomes of training, it is difficult to state with confidence that it was successful. Impacts assessment can be formal and thorough, or less formal and lighter, but still highly useful. Some methods can include:

- Providing questionnaires or checklists that allow supervisors to evaluate if the participant's performance has improved
- Providing checklists to participants to self-assess during or following significant events, and requiring these to be shared with the training provider
- Providing 6-month to one-year follow up questionnaires for participants and managers on benefits of the training
- Using follow-up online seminars to refresh learning and share application experiences
- Using online discussion forums for continued sharing of application experiences
- Providing action plan or report templates to participants to be shared after on-the-job experiences within their institution

3.9 A note on working with diverse learner audiences

Particularly when training learners from throughout a region or from other parts of the globe, it can be difficult to know how to follow the preceding guidance. When needs are diverse, it can be more difficult to determine what skills to address and how to conduct the training to have the highest impact for the most learners. Learners may vary in terms of culture, climate regimes, level of background knowledge, native language, national capacities and procedures, and technological capabilities. Yet competency-based training, in particular, requires practice, coaching, discussion, and feedback. Even when using active learning approaches, diversity can be accommodated in several ways.

First, a variety of examples and cases can be included, demonstrating how what is being learned can be used in a variety of climate regimes, within a variety of technological environments, and with more or less complex procedural constraints.

Second, a focus on general problem solving, analysis, decision-making, and communication independent of the specific set of tools they will eventually use will help to build transferable higher-order skills. Allowing learners to perform problem solving in conditions that best match their work environments will also ensure a higher degree of applicability.

When teaching highly technical skills, at times it is necessary to choose a technical training platform best suited conditions required for learning, even if it is not a platform that learners have immediate access to. In these cases, it is important to at least discuss how the technology differs from what they may have available, and how they might alter their procedures when applying them outside the training. It is good to prepare learners for technologies they expect to have available in the near future, but they will lose those skills if they cannot practice them in the meantime.

4. Conclusions

From the above discussion, one can draw several key conclusions that might lead to recommendations from SYMET participants.

1. A number of WMO initiatives point to paradigm shifts occurring in the way NHMS services are being delivered, including an increased focus on impacts, a higher degree of data integration, and seamless forecast delivery at multiple spatial and temporal scales.
2. WMO competency frameworks are being put in place to guide training providers to develop training that will address critical skills and knowledge for staff members in many service areas.
3. While these initiatives have a degree of overlapping training needs, they suggest that a wide range of training must occur if WMO Members are to keep pace with changing methodologies and technologies.
4. SYMET participants are critical training partners in WMO initiatives, and must be engaged to disseminate knowledge and skills in service areas.
5. The number of WMO publications that contain guidance material for these initiatives is high, and clearer direction on their access would be useful. Training providers offering training in related areas must be aware of this material.

6. The scope of training that must occur in the short term suggests a need for careful prioritization, planning, and choice of training delivery modes.
7. Training needs assessments are important to help prioritize training efforts and define the scope of training events and resources.
8. Guidance on recommended learning pathways to develop expertise in each service area will be useful.
9. To ensure learning- and cost-effective training, all potential learning solutions should be considered, particularly blended solutions.
10. Model plans or example training plans could guide good training practice in the various content areas.
11. Training impacts evaluation is essential for guiding and improving training practices.
12. Working with diverse international audiences brings special challenges, but these can be mitigated or overcome.

5. Recommendations

SYMET should consider the following recommendations based upon the conclusions drawn from the preceding outline of evolving service-specific education and training requirements. Additional recommendations or revision of these is expected to result from online and symposium discussions.

(a) Recommendations for training institutions include:

i. Regularly reviewing WMO guidance material and competency frameworks as they are approved and published, and updating existing curricula as required.
ii. For each service area, sharing learning resources with other training providers to help meet the immense global training needs.
iii. Indicating their expertise and willingness to contribute to training in each of the training areas.
iv. With WMO guidance, developing effective planning methods to ensure maximum results for each training effort.
v. Developing and sharing recommended learning pathways to develop expertise required in each service area.
vi. Considering all potential learning solutions, particularly blended solutions, when developing training plans. Sharing guidance and experiences with different learning solutions.
vii. Offering courses and course descriptions for review by the WMO Secretariat if they will seek co-sponsorship of participants by WMO. Sharing post-course reports.
viii. Conducting the best competency-based training possible, even when working with diverse international audiences.
ix. Encouraging communications and partnerships with NHMSs and local and regional universities to ensure seamless information exchange and strong connections between research, education and training and operations.

(b) Recommendations for the WMO Secretariat and Technical Commissions include:

i. Providing clear direction on which WMO publications are most critical to each service area and consolidating access to them

ii. Making available training resources for all areas for access by WMO Members and WMO training providers.
iii. Announcing its training initiatives and strategies, along with calls for participation in training initiatives.
iv. Developing model or example training plans to guide good training practice for each service area.
v. Providing guidance on performing training impacts evaluations.
vi. Evaluating progress on SYMET recommendations each year, making revisions as necessary.
vii. Sharing guidance and experiences on the use of different learning solutions.
viii. Developing and sharing potential learning pathways to develop expertise required in each service area.

(c) Recommendations for NMHSs or Regional Associations include:

i. Putting in place appropriate competency assessment systems and reporting to the WMO Secretariat on their status.
ii. Developing effective methods of performing training needs assessment, and sharing the results for use by the Secretariat, Regional Training Centers, and other training providers.
iii. Encouraging communications and partnerships between RTCs, NHMSs and local and regional universities to ensure seamless information exchange and strong connections between research, education and training and operations.

(d) Recommendations for development partners and international organizations:

i. Reinforcing WMO qualifications and competency standards in capacity development efforts.
ii. Promoting the sharing of training resources and best practices to promote successful capacity development.