

PROGRESS REPORT ON DELIVERABLES

July-December 2015

PART 1: BACKGROUND

1. Purpose and Scope

The WMO Monitoring and Evaluation System calls for the biannual self-evaluation of progress on deliverables, or the extent to which the Organization is delivering what it has committed itself to deliver. Contrary to the Key Performance Indicators which measure performance at the *outcome* level for the whole of WMO, the progress on deliverables report is focused on the Secretariat and the *outputs* of its activities.

The purpose is to ensure that implementation of the Strategic Plan, as relates to activities in the WMO Operating Plan, is on track, that issues are detected early, and that corrective actions are taken. The report covers regular budget and some extrabudgetary activities.

2. Methodology

The current report measures progress on deliverables for July-December 2015 based on reports from Departments on progress in implementation of 396 Programme Activities Planned and Funded for Implementation in the period 2014-2015 as relates to the following:

- (1) *Status of activities* (completed, in progress, not started yet, recurrent, cancelled);
- (2) *Timeliness* (on time, ahead of schedule, behind schedule, rescheduled, N/A);
- (3) *Cost* (within budget, under budget, over budget, N/A)

Departments were also requested to indicate the types of activities in accordance with the following generic categories:

- (a) Organize, prepare documents, participate in and report on meetings and workshops;
- (b) Provide or support development of working papers/plans (workplans, implementation plans, etc.)/guidelines/questionnaires/surveys, etc.
- (c) Maintain, develop and publish technical regulations / manuals / scientific and technical reports;
- (d) Support technical commissions, regional associations, the Executive Council and its working groups as well as monitor, review and follow-up on related activities and provide technical and scientific advice;
- (e) Organize training, capacity building and infrastructure development activities;
- (f) Internal activity in support of Secretariat functions and infrastructure.

Departments further identified the constraints and risks encountered in the course of implementing activities and assigned *alert status* to each activity, using the traffic lights to indicate:

-  Green: smooth activity implementation;
-  Yellow: a problem/hindrance in implementation, which can potentially escalate but the Department is working on resolving it; and
-  Red: a problem/hindrance in implementation, which requires the intervention of the Executive Management.

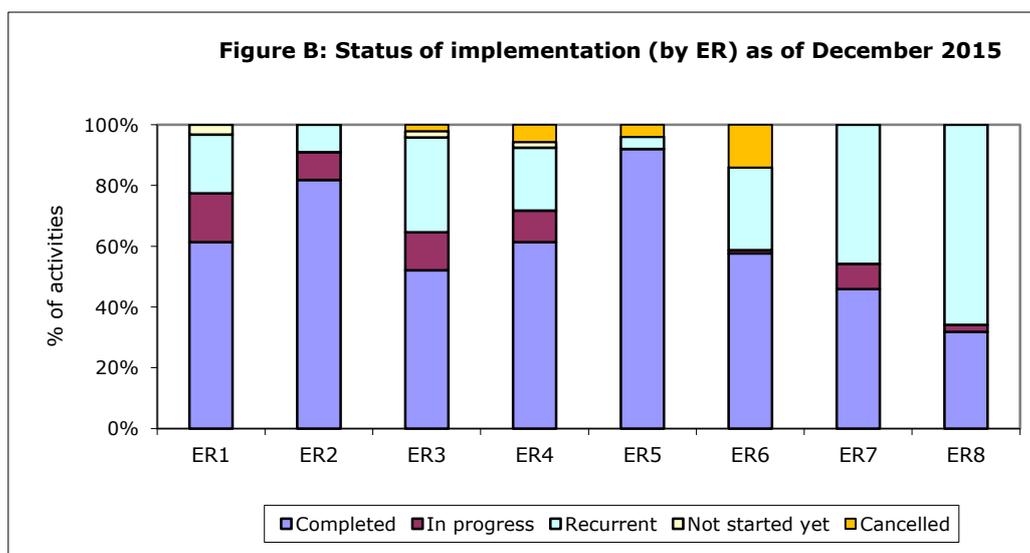
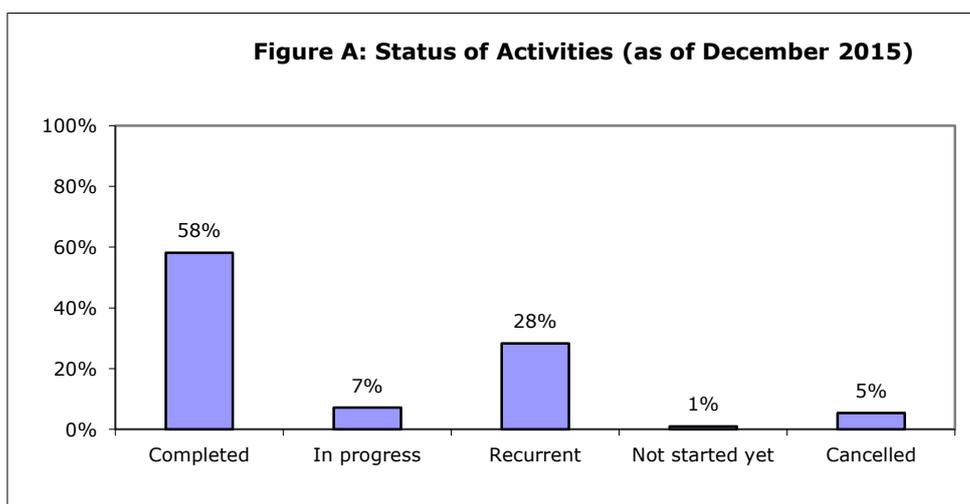
PART 2: Overall Performance

The following are highlights of the Secretariat’s overall performance in the implementation of the activities in the Operating Plan 2014-2015 for the period July-December 2015. A summary of progress and issues concerning the status, timeliness and costs related to implementation of activities associated with specific Expected Results (ERs), as listed in Annex 1, is also presented below. A detailed account of progress along the three categories for each ER is contained in Part 3, which also provides highlights on the deliverables/outputs achieved in the reporting period.

1. Status of Implementation

Figure 1 indicates that 58% of activities were completed and 28% of recurrent nature as of December 2015. The 7% of activities still in progress refer to activities behind schedule, whereas the 1% 'not started yet' comprised of activities rescheduled to 2016. Five percent of the planned activities were cancelled.

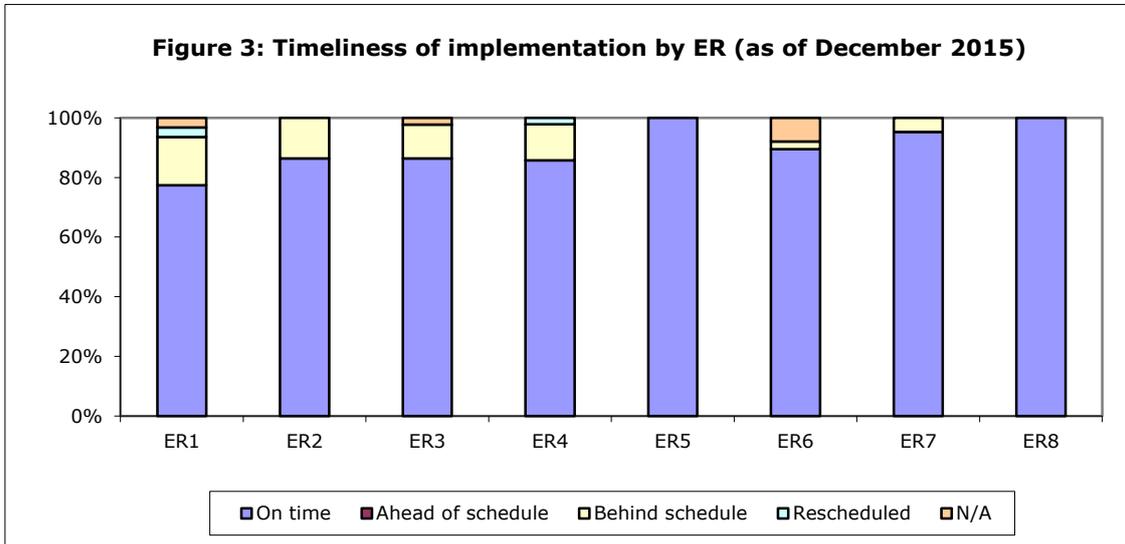
The status of implementation by ER is presented in Figure 2. All ER5 activities as well as almost all ER 6 and ER 8 activities were completed or recurrent. Between 10% and 15% of ER 1, ER 2, ER 3 and ER 4 activities were behind schedule as of December 2015, and hence marked as 'in progress' in Figure 2. Fourteen percent of ER 6 activities were cancelled.



In the figures on timeliness and cost of implementation, N/A refers to cancelled or delayed activities.

2. Timeliness of Implementation

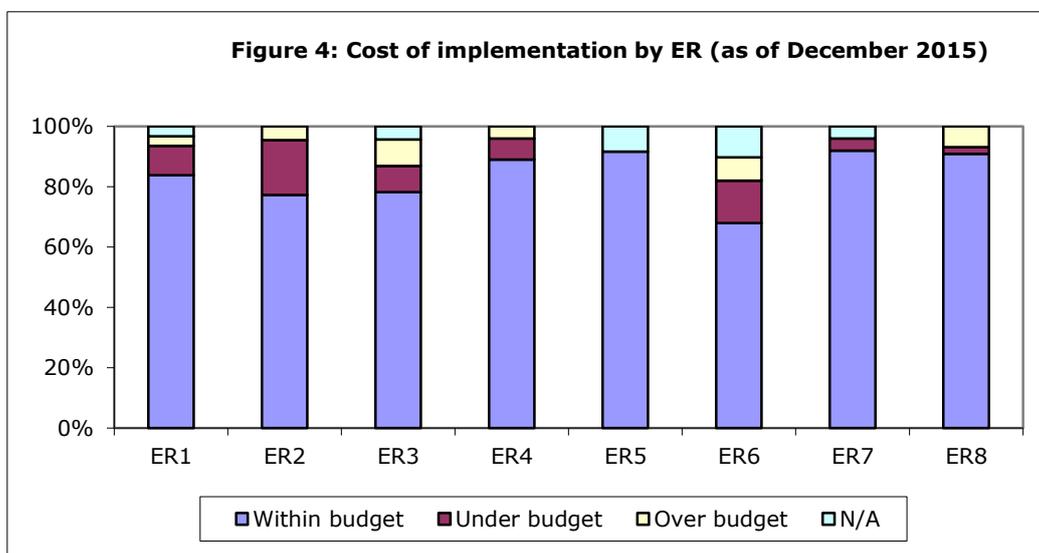
As evident from Figure 3, most of the activities were implemented on time. All ER 5 and ER 8 activities were executed according to schedule, as were 85%-95% of the activities of all other ERs (except ER 1). About a fifth of ER1 activities were implemented late or rescheduled. This was also the case for 14% of ER 2 and ER 4 activities as well as 11% of ER 3 activities. More details on the factors affecting timeliness are available in Part 3 (see 'Constraints/Risks').



3. Cost of Implementation

Eighty-three percent of the planned activities were implemented within their allotted budget. This proportion was highest for ER 5 (92%), ER 7 (92%) and ER 8 (91%), as presented on Figure 4. For the rest of the ERs, the activities implemented within budget ranged from 68% to 89%. Savings were realized under ER 6, with 16% of activities having been implemented with less funds than allotted. Expenditure was less than allotted for 18% of ER 2 activities and 10% of ER 1 activities. These two ERs also had the largest share of late activities (see Figure 3), which explains the underspending.

Expenses on most of the ERs were within the budget. Any excess costs on specific activities were compensated by equivalent savings on other activities. For example, expenses on 9% of ER 3 activities exceeded the budget but were compensated by savings on an equivalent proportion of activities (9%).



In the figures on timeliness and cost of implementation, N/A refers to cancelled or delayed activities.

4. Alert Status

The implementation of most activities did not encounter any constraints or faced risks, as demonstrated by the green status assigned to 84% of activities (Table 1).

Ten percent of activities faced some obstacles which were tackled by each respective Department (marked with a yellow alert status). These were primarily related to coordination issues involving multiple stakeholders, implementation delays, insufficient staff and budget constraints. More details are provided in the Constraints/Risks section of each ER in Part 3.

Green	84%
Yellow	10%
Red	0%
N/A	6%

Table 1: Alert Status of Activities (Jul-Dec 2015)

5. Types of Activities Implemented

Figure 5 presents the type of activities implemented by the WMO Secretariat in July-December 2015 along the six generic categories listed in Part 1, Section 2 (Methodology).

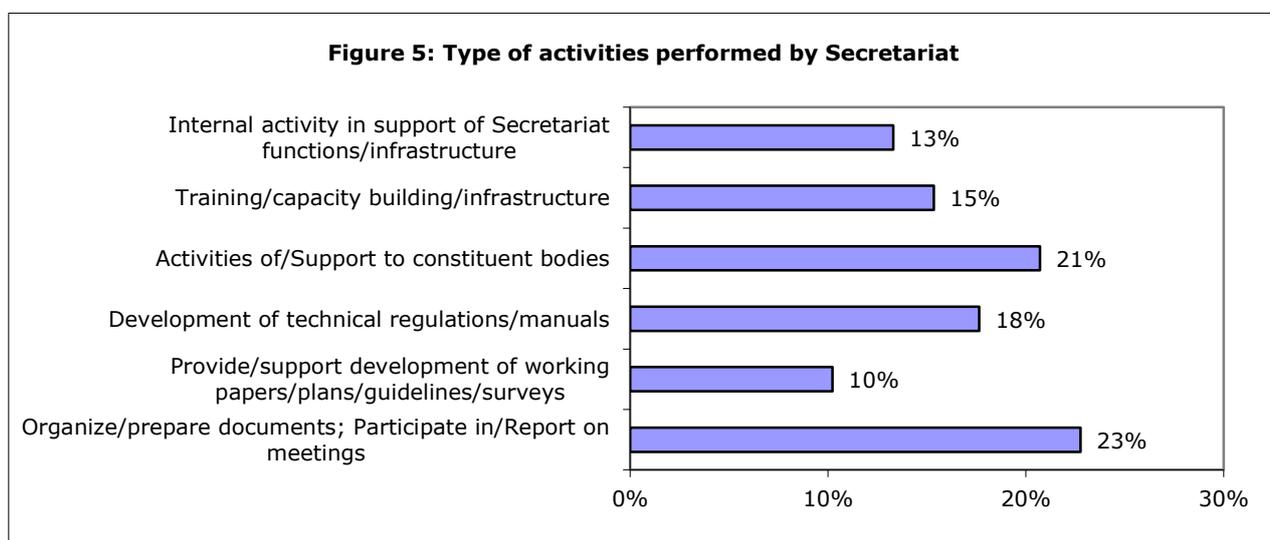


Table 2 presents the percentage of activities which fell within these six categories per ER.

Table 2: Type of Activities Implemented (by ER) in %

Type of activity (%)	ER 1	ER 2	ER 3	ER 4	ER 5	ER 6	ER 7	ER 8
1. Organize, prepare documents, participate in and report on meetings and workshops	56%	48%	17%	21%	12%	17%	44%	2%
2. Provide or support development of working papers / plans / guidelines / surveys, etc.	19%	24%	28%	8%	0%	4%	0%	7%
3. Maintain, develop and publish technical regulations / manuals / scientific and technical reports	0%	5%	21%	25%	72%	7%	24%	5%
4. Support TC, RA and EC/WGs, monitor, review and follow up on activities and provide technical and scientific advice	19%	5%	21%	32%	8%	15%	0%	33%
5. Organize training, capacity building and infrastructure development activities	0%	14%	4%	8%	4%	48%	4%	2%
6. Internal activity in support of Secretariat functions and infrastructure	6%	5%	9%	7%	4%	9%	28%	51%

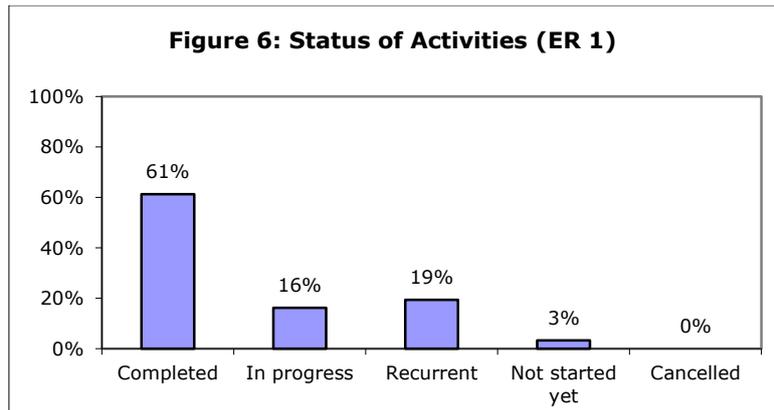
In the figures on timeliness and cost of implementation, N/A refers to cancelled or delayed activities.

PART 3: Performance by Expected Result

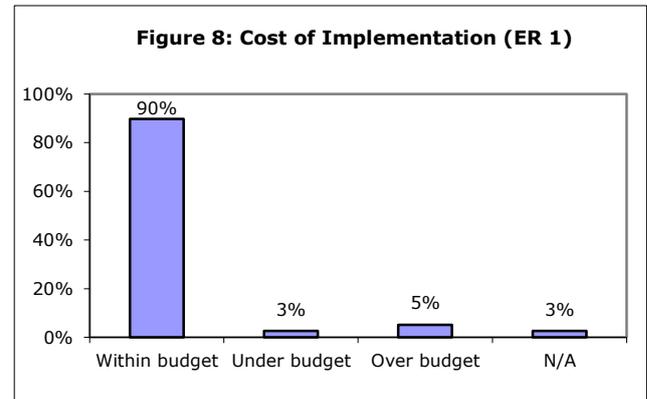
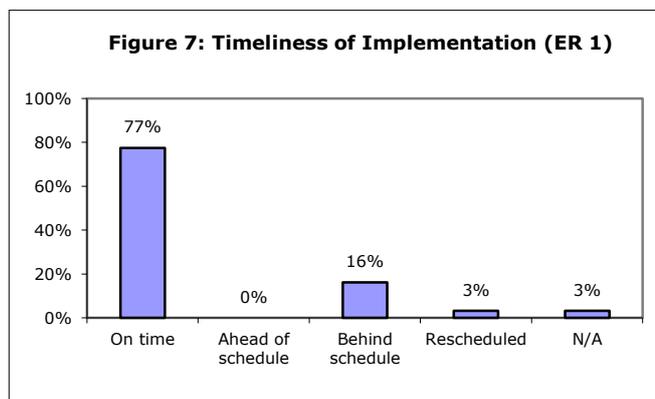
EXPECTED RESULT 1

a. Status of Activities, Timeliness and Cost

Sixty-one percent of ER 1 activities were completed as of December 2015 and an additional 19% involved activities of recurrent nature.¹ Sixteen percent were behind schedule and hence marked as 'in progress' on Figure 6. However, they were all at an advanced stage of implementation, with 80-90% of the work completed.



Most activities implemented late were related to the work of CBS expert teams, such as the Expert Team on Nuclear Power Plant Siting and Operations, the Expert Team on Data-Processing and Forecasting System (DPFS), and the Expert Team on Ensemble Prediction Systems. Others included advisory services on emerging issues of Emergency Response Activities and the development of guidance material on analysis and evaluation of agrometeorological data, products and services.



As evident from Figures 7 and 8, over three-quarters of the ER 1 activities were implemented on time and 90% within their allocated budget. The scheduled meetings on air transport modelling were rescheduled to 2016, standing for the 3% of activities that had not been started yet on Figure 6 and the 3% rescheduled activities on Figure 7.

b. Constraints/Risks

Four ER 1 activities were assigned a yellow alert status due to the following constraints in the course of implementation:

¹ Recurrent activities involve activities of continuous, periodic nature, such as support to the presidents of technical commissions, operating expenses, etc.

In the figures on timeliness and cost of implementation, N/A refers to cancelled or delayed activities.

🟡 *Coordination issues:*

- The “Advisory services on emerging issues of Emergency Response Activities,” the “CBS Expert Team on Nuclear Power Plant Siting and Operations” and “CBS Implementation Coordination Teams” involve experts from different technical commissions, which requires further coordination and resources.

🟡 *Staffing constraints:*

- Reliance on extrabudgetary funds has been limiting the ability of the Global Framework for Climate Services (GFCS) Office to secure human resources, especially in the area of communications.

c. Highlights of Outputs/Deliverables

Aeronautical Meteorology

- 90 participants from 37 RA-VI countries and 7 international organizations took part in the European Conference on Meteorology for Aviation which took place in Vienna, Austria, 13-14 October 2015. The meeting built awareness of the forthcoming developments in the aviation meteorology at global and regional scale. Six RA-VI Members were assisted to build national plans aligned with the ICAO Global Air Navigation Plan and the European Single European Sky regulations;
- The 7th International Workshop on Volcanic Ash (19-22 October 2015, Anchorage, USA) was a major scientific event with almost 100 participants from academia, meteorological service providers, regulators and aviation user community who shared information and experience in monitoring and forecasting volcanic ash as a major aviation hazard. A set of recommendations were designed for furthering research and transferring research to operations;
- The Aviation Research Demonstration Project (AvRDP) was kicked off in July 2015 in Hong Kong, China. AvRDP is a collaborative project of the Commission for Aeronautical Meteorology (CAeM), the Commission for Atmospheric Sciences (CAS), and the Commission for Basic Systems (CBS), aimed at developing improved forecasting at busy airports and their terminal areas. The first phase involves five airports from Hong Kong, China; China; France; Canada and South Africa;
- With 35 participants from RA-III and RA-IV, the WMO RA-IV Workshop on Aeronautical Competencies and SIGMET (San Jose, Costa Rica) assisted in improving the availability and quality of SIGMET information by addressing related deficiencies. It also contributed to progressing the competency assessment of aeronautical meteorological forecasters.

Public Weather Services (PWS)

- The CBS Implementation Coordination Team met in Dublin in December 2015 and made proposals to be presented to the CBS Management Group for discussion and approval. These include the renaming of the PWS OPAG to OPAG on Public Weather Services Delivery as well as shifting the structure of the OPAG towards the establishment of task teams focused on specific, time-bound objectives;
- Expert teams reported on their deliverables at meetings held, including a service delivery survey, the development of guidelines to NMHSs on various PWS aspects, and a PWS Media Survey. They also reviewed their Terms of Reference (ToRs).

Emergency Response

- A fourth draft of the revised WMO Technical Note 170 under preparation.

Agricultural Meteorology

- Final METAGRI Workshop held in November 2015;
- Implementation Coordination Team Meeting of Expert Team Leaders held in October and ET 1.2 Meeting held in November 2015.

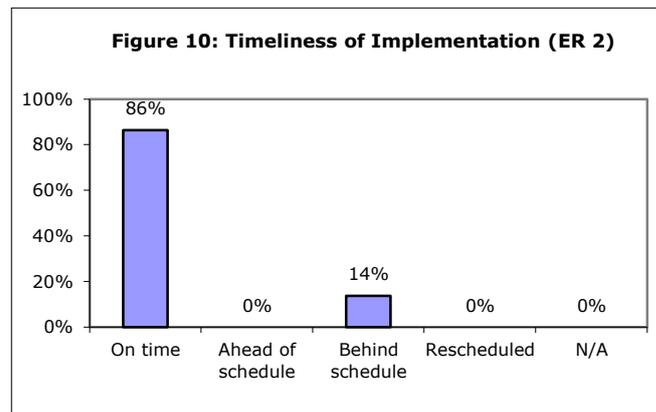
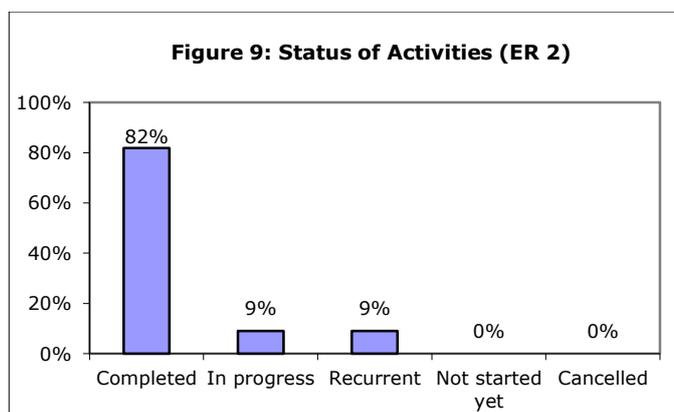
GFCS

- An expert was seconded from the NOAA National Weather Service to the GFCS Office for the period September 2015 to January 2016 to help with work on the Climate Services Information System (CSIS). The expert is to develop a Climate Services Toolkit.

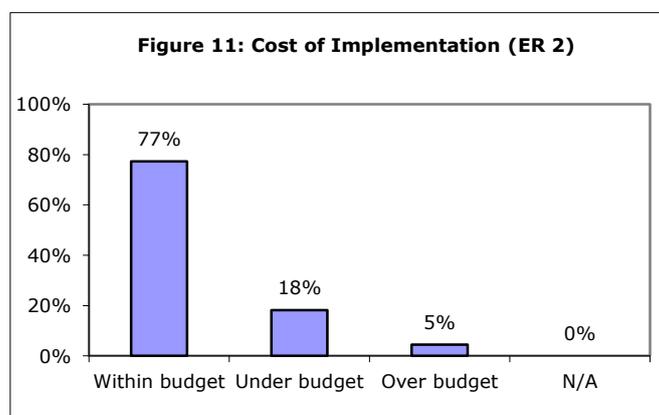
EXPECTED RESULT 2

a. Status of Activities, Timeliness and Cost

As shown on Figure 9, almost all ER 2 activities were either completed or were of recurrent nature as of December 2015. The vast majority (86%) were implemented on time, while only three activities were lagging behind schedule. These represented 14% of the overall ER 2 activities presented in Figure 10.



The late activities involved a meeting of the Steering Group Severe Weather Forecasting Demonstration Project (SWFDP), which was rescheduled to March 2016; helpdesk services and technology transfer in flood management, which was 80% completed as of December 2015; and secondments to address emerging issues of DPFS with completion progress estimated at 90%.



Two of the three activities behind schedule comprise the 9% activities "in progress" on Figure 9. In terms of expenditure, over three-quarters of ER 2 activities were implemented within budget, with savings realized on almost a fifth of activities. The latter were related to SWFDP and the Flood Forecasting Initiative (FFI). The development/implementation of national pilot

In the figures on timeliness and cost of implementation, N/A refers to cancelled or delayed activities.

projects under FFI was the only activity which absorbed more resources than envisioned, amounting to 5% of the overall ER 2 activities presented in Figure 11.

b. Constraints/Risks

- A yellow alert status was indicated for one ER 2 activity:
 - “Secondments of NMHSs staff to address emerging issues of DPFS” involves experts from different technical commissions and requires further coordination and resources.

c. Highlights of Outputs/Deliverables

Severe Weather Forecasting

- Regional Operational Plans developed for RA-I and RA-V Tropical Cyclone Committees, the RA-IV Hurricane Committee, and the Panel on Tropical Cyclones;
- Typhoon Operational Manual developed;
- Database for SWFDP reporting in use following its development and testing in the previous reporting period;
- Storm Surge Watch Scheme implemented in three of the five regional bodies.

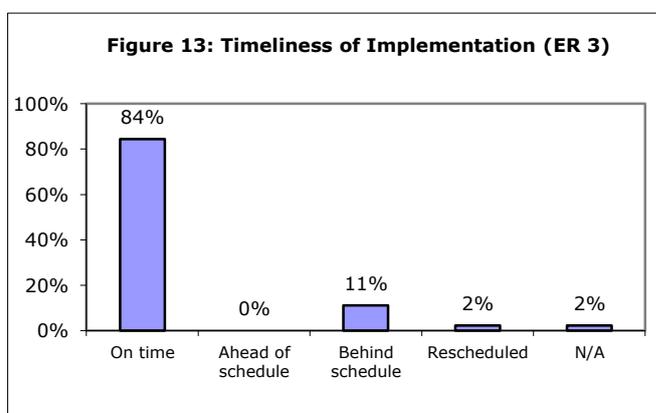
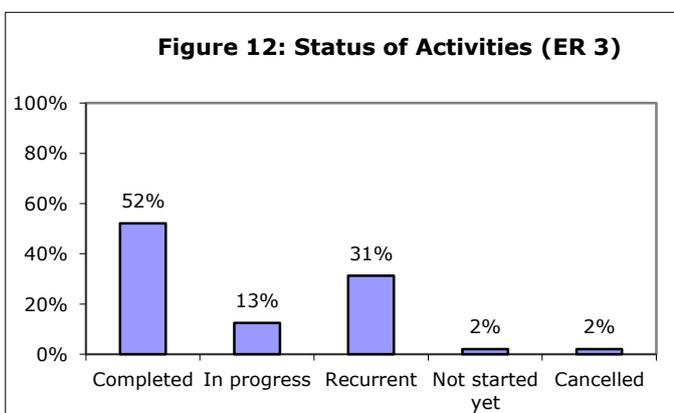
Flood Management

- Standardized Precipitation Index User Guide published;
- Continued integration of the Flash Flood Guidance System (FFGS) into the SWFDP-Southern Africa;
- Associated Programme on Flood Management tools under preparation and revision;
- FFI Advisory Group meeting held in November 2015;
- Trainings on FFGS conducted for Southern Africa at the Hydrologic Research Centre headquarters.

EXPECTED RESULT 3

a. Status of Activities, Timeliness and Cost

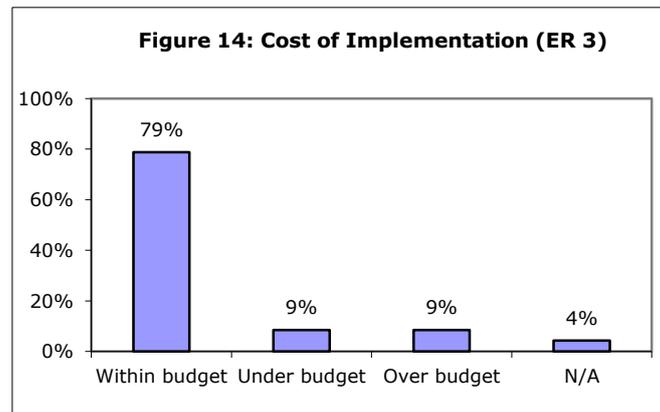
As of December 2015, 83% of ER 3 activities were completed or involved activities of recurrent nature. The 13% activities “in progress” on Figure 12 were linked to an equivalent portion of activities lagging behind schedule (see Figure 13).



The majority of these late activities were at an advanced stage of implementation, with 80%-90% of the work completed (e.g. development of GFCS energy exemplar, guidance material on best practices on the use of climate information for agricultural risk management, publication of manuals and technical documents related to climate information products). Only one

activity – the development of Climate Information and Prediction Services (CLIPS) toolkit – was still halfway through implementation as of December 2015. Progress on the standardization of Regional Climate Center (RCC) product presentation and dissemination was estimated at 70%.

The meeting of the Advisory Working Group of the Commission on Hydrology (CHy) was rescheduled to February 2016. It accounts for the 2% of activities “not started yet” on Figure 12 and for the 2% rescheduled activities on Figure 13. Implementation of capacity development activities on climate change adaptations was subsumed under CHy activities. It stands for the 2% cancelled activities on Figure 12.



Most ER 3 activities were implemented within their assigned budget, as demonstrated by Figure 14. Activities for which expenditure exceeded the initial projection were related to support to Regional Climate Outlook Fora (RCOF), support to the President of CHy, evaluation of performance of hydrological instruments and techniques, and support to water resources assessment activities. The effect of these overspending activities was mitigated by equivalent savings on 7% of ER 3 activities. Activities which spent less than anticipated included the Sixteenth Session of CCI, support to joint CCI-WCRP activities on regional climate predictions and projections, publication of manuals according to the Quality Management Framework on Hydrology, and development of new and support to existing WHYCOS components. Cancelled activities and one recurrent activity appear as N/A on Figure 14.

b. Constraints/Risks

🟡 Two activities were assigned a yellow alert status:

- The Management Committee of the Intergovernmental Board on Climate Services (IBCS) requested minor revisions to the energy exemplar before its approval, thus delaying its release by a year;
- The RA-V training on groundwater monitoring was delayed and subsequently postponed to April 2016.

c. Highlights of Outputs/Deliverables

Climate Data Processing and Management

- Improved Climate Data Management Systems (CDMS) model initiated;
- Policy statement on CDMS issued;
- Concept of Operations of High Quality Global Data Management Framework finalized;
- Calculation of climate change indices done by Indian Ocean rim countries and islands;
- Two CDMS upgraded.

Climate Prediction and Risk Management

- A preliminary WMO Annual Statement on the Status of Global Climate released at COP-21;
- El Niño/La Niña Update issued;

In the figures on timeliness and cost of implementation, N/A refers to cancelled or delayed activities.

- Global Seasonal Climate Update developed, including a trial phase;
- CLIPS toolkit concept developed at the ICT-CSIS meeting in November 2015 and a mock-up toolkit is in its final stages of development;
- ClimPACT software Version 2 completed, draft publication finalized, and training provided in a workshop for the Pacific island region.
- Global Seasonal Climate Update prototype finalized and external peer review completed;
- Guide on Climatological Practices (WMO No100) translated in all WMO languages;
- ClimPACT Manual draft completed;
- National Climate Outlook Forums (NCOF) Guidance draft developed.

GFCS

- An energy exemplar drafted, peer reviewed and submitted to IBCS Management Committee for approval.

Hydrology and Water

- Manual on Water Resources Assessment and downscaling guidance under preparation;
- Letter of Agreement between WMO and the University of Iowa signed on software for uncertainty analysis;
- WHYCOS Guidelines in English edited and published.

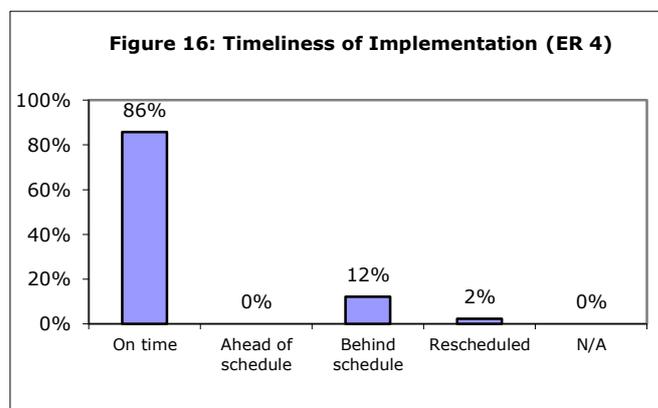
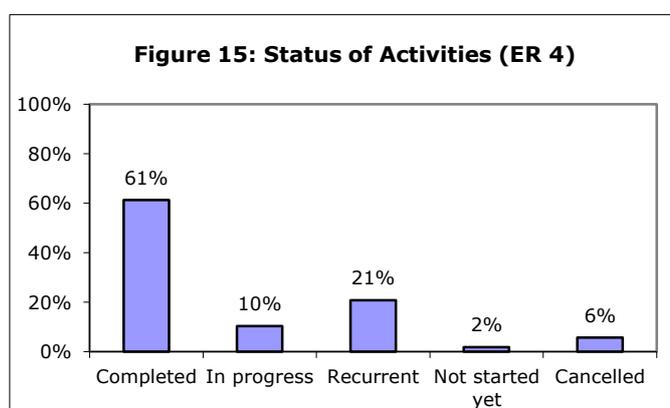
Agricultural Risk Management

- A brochure edited and awaiting final approval.

EXPECTED RESULT 4

a. Status of Activities, Timeliness and Cost

As of December 2015, over 80% of ER 4 activities had been completed or involved activities of recurrent nature (see Figure 15). Ten percent of activities were still in progress, which comprised of late and rescheduled activities. The majority of these were at an advanced stage of implementation, with 80%-90% of the work completed (e.g. review of WMO Technical Regulations No 49, updating of WIS-related manuals and guides, metadata support for WIGOS implementation, meetings of expert teams on training needs, as well as the work of the Task Team on Metadata and the Task Team on Aviation XML of the Inter-Commission Coordination Group on WIGOS (ICG-WIGOS).

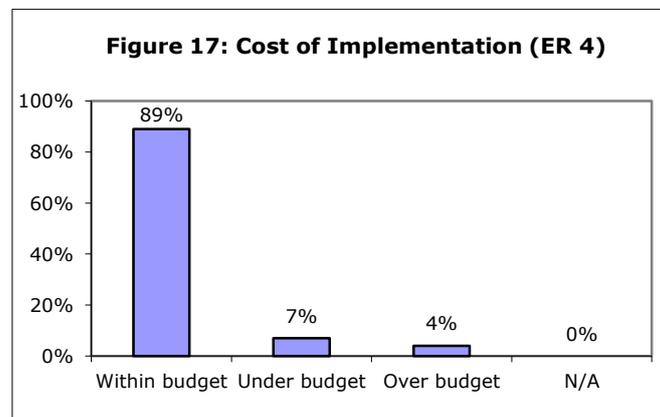


For two activities, progress was estimated at 60%-70% of completion. These included the development of the WIGOS Operational Information Resource and support of product coordination through expanding SCOPE efforts. Three activities were halfway through as of December 2015: advisory services on issues of WIGOS, consultancy for Instruments and Methods of Observation Programme (IMOP) development and implementation in WIGOS context, and the establishment of the Global Cryosphere Watch (GCW) Project Office. With

In the figures on timeliness and cost of implementation, N/A refers to cancelled or delayed activities.

only 20% of the work implemented, the consultancy and seconded experts for IMOP standards development for WIGOS was seriously behind schedule.

Two activities related to the advanced coordination in space weather and satellite observation integration were rescheduled. These also represent activities “not started yet” on Figure 15. Cancelled activities amounted to 6% of the total, including four meetings of task teams of the Inter-Programme Expert Team on WIGOS Framework Implementation (IPET-WIFI), a RA-II Technical Workshop on AMDAR, and a meeting of the Task Team on ISO Standards of the Commission for Instruments and Methods of Observation (CIMO).



In terms of expenditure, close to 80% of activities were implemented ‘within budget,’ as indicated on Figure 17. Savings were realized on 7% of activities, including CBS and CIMO management meetings, support to the President of CIMO and several late activities. Four percent of activities exceeded their allotment, including metadata support for WIGOS implementation, the update of CIMO Guide and Manual, the meetings of the International Organizing Committees for intercomparisons, and the work of the Task Team on Aviation XLM.

b. Constraints/Risks

Twenty-four activities, amounting to a quarter of the overall ER 4 activities, received a yellow alert status. The following risks and constraints affected activity implementation:

Financial constraints:

- Data Buoy Cooperation Panel (DBCP) budget at risk due to unforeseen expenses related to the Intergovernmental Oceanographic Commission (IOC) TC DBCP post;
- Lack of dedicated resources (funding, staff) to accelerate progress in SCOPE-Nowcasting;
- Budget for meetings of the CBS Lead Centres for GCOS has yet to be approved for 2016.

Staffing constraints:

- Retirement of key staff working on satellite observation integration caused carry-over of activities to 2016;
- Delayed establishment of the GCW Project Office.

Implementation Issues:

- Additional efforts required with regard to network design, implementation targets, and risk assessment (JCOMM Observation Coordination Group Meetings);
- Limited feedback received from members of the Data Management Coordination Group;

In the figures on timeliness and cost of implementation, N/A refers to cancelled or delayed activities.

- The Ocean Data Portal not widely used in IOC;
- WIGOS self-assessment checklist of limited use due to low response rate;
- Assumed familiarity with WIGOS issues too high;
- Unclear how to realize the recommendation of the Consultative Meetings on High-level Policy on Satellite Matters (CM) to study the impact of observing systems on climate and other applications;
- Difficulty in expanding the Sustained, Coordinated Processing of Environmental Satellite Data for Climate Monitoring (SCOPE-CM) beyond current Essential Climate Variables;
- Update of SCOPE-CM Implementation Plan behind schedule;
- Delayed organization of CBS Task Team on Weather Radar Data Exchange Meeting;
- Lack of understanding of WIS branch needs in terms of ITD infrastructure, especially in providing guidance on technical solutions related to the migration of specialist applications;
- Restructuring of the WMO Technical Regulations No 49 introduced delays at the editorial stage. They also affected the publication of ICAO Meteorological Information Exchange Model (IWXXM);
- Metadata support for WIGOS implementation is ahead of the original schedule but behind that required by the Observing Systems Analysis and Review (OSCAR).

Coordination Issues:

- Lack of coordination between DRA and OBS places actual implementation of steps listed in Regional WIGOS Implementation Plans at risk;
- Work on the WIGOS Metadata Standard (part of the WIGOS Regulatory Material) is complicated due to the involvement of several technical commissions and two separate OPAGs within CBS;
- Lower attendance than usual at the Technical Conference on Meteorological and Environmental Instruments and Methods of Observation (CIMO-TECO) due to political problems in the region. CIMO-TECO is normally held in conjunction with Meteorex. However, the Meteorological Technology World Exhibition (MTWE) is now "competing." It would be beneficial to combine efforts with MTWE in the future.

Unspecified reasons:

- WIGOS Regulatory Material (Technical Regulations and Manual on WIGOS);
- The Sub-Group on Regulatory Material will be dissolved after CBS-16;
- Development of the WIGOS Operational Information Resource.

c. Highlights of Outputs/Deliverables

Instruments and Methods of Observation

- A questionnaire on Regional Standard Barometers finalized, a calibration strategy developed, and an update of CIMO Guide Chapters related to Minamata Convention on Mercury realized as a result of the meeting of the Expert Team on Operational Meteorology (ET OpMet).
- Plans for Solid Precipitation Intercomparison Experiment (SPICE) data evaluation completed.
- WMO contribution to the development of ISO standard planned to become common WMO-ISO standards.

Availability and Use of Satellite Data and Products

- "Satellites for climate services: Case studies for establishing an architecture for climate monitoring from space" (WMO N°1162) published;
- A Vision of Space-based Observing System in 2040 drafted;
- Global Space-based Inter-Calibration System Users Workshop held (Toulouse, France, September 2015);
- Draft Guide to Direct Broadcast Network available for external review;
- Participation in the Scientific and Technical Sub-Committee of the Committee on the Peaceful Uses of Outer Space (COPUOS) provided visibility to the WMO Satellite Programme in the UN system.

Global Observing System (GOS) and WIGOS

- WIGOS Information Resource portal set up (static pages);
- OSCAR tool developed and on track;
- Updated DBCP implementation strategy as well as workplan and budget for 2016 agreed;
- Training of port meteorological officers held (Viña del Mar, Chile, 20-24 July 2015) and recommendations on best practice made;
- RA-I Technical Workshop on AMDAR held (Morocco, December 2015);
- JCOMM Data Management Plan updated;
- Regional WIGOS Implementation Plans approved for all WMO regions;
- Final report of meeting of the CBS IPET-WIFI developed (Exeter, United Kingdom, September 2015) describing a workplan for integrating IPET-WIFI activities into ICG-WIGOS and other technical commissions' expert teams.

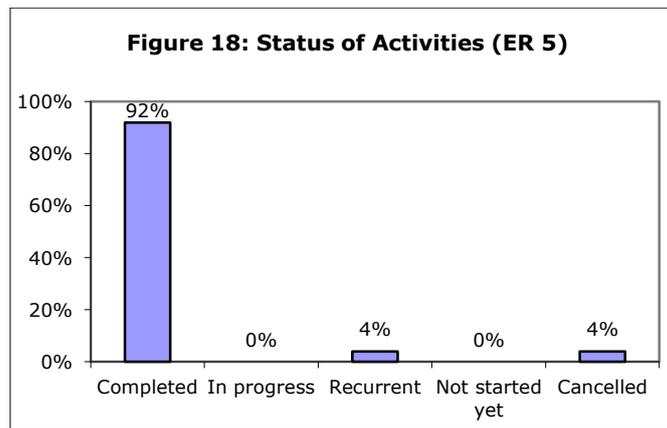
WIS

- Work on data representation issues advanced at a meeting of the Inter-Programme Expert Team on Data Representation Maintenance and Monitoring in July 2015. Work on coding OPMET data was also advanced at the Air Transportation Information Exchange Conference;
- An approach to new version for WIS metadata standard defined at a meeting of the Inter-Programme Expert Team on Metadata and Data Representation Development;
- WMOs needs were successfully addressed at the World Radiocommunication Conference 2015. Deliverables included representation of WMO at related meetings and a meeting of the Steering Group on Radio Frequency which provided the final WMO position paper and workplans for WRC-15 and the First session of the Conference Preparatory Meeting (CPM19-1).
- Initial peer review of proposed standard on metadata support for WIGOS implementation conducted and modifications in response being prepared.

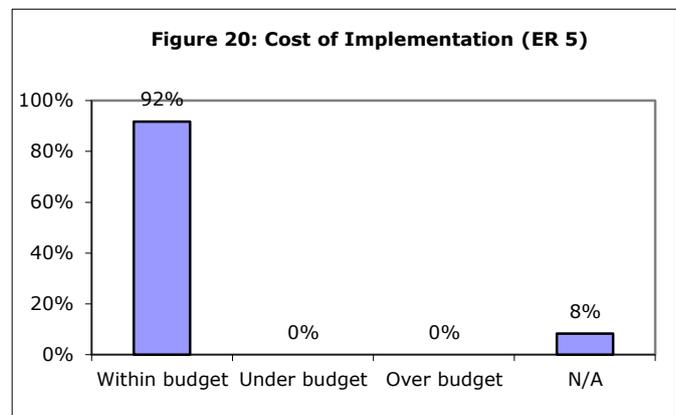
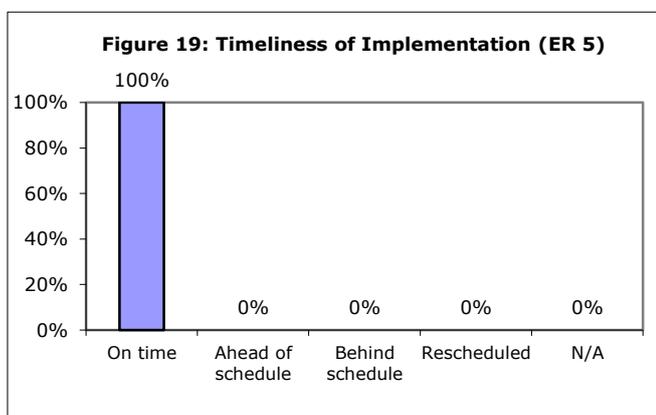
EXPECTED RESULT 5

a. Status of Activities, Timeliness and Cost

Figure 18 below shows that all ER5 activities were completed or involved activities of recurrent nature as of December 2015. One activity, representing 4% of the total, was cancelled ("Nowcasting research working group, project and other technical meetings with Joint Nowcasting Applications and Services (JONAS), PWS and related publications").



Regarding timeliness, all ER 5 activities were carried out within the expected time and according to budget, as demonstrated by Figures 19 and 20. N/A stands for the cancelled activity mentioned above and one recurrent activity (a quadrennial symposium on data assimilation, nowcasting, verification and forecast systems research). No such symposium was scheduled to take place during the period.



b. Constraints/Risks

🟢 No risks and constraints were identified in the reporting period.

c. Highlights of Outputs/Deliverables

Weather Research

- A draft Science and Implementation Plan for the World Weather Research Programme (WWRP) developed for 2016-2023;
- Meeting Report of 8th Scientific Steering Committee WWRP Meeting (24-27 November 2015) published;
- New ToRs and future plans/activities developed for the Working Group on Predictability Dynamics Ensemble Forecasting, including plans for possible linkage with other WWRP working groups and projects;
- New ToRs developed of the merged Nowcasting and Mesoscale Working Groups, including future research directions and preparations for the 2016 Symposium on Nowcasting.
- Reports, proceedings and implementation plans published in the area of:
 - Sand and Dust Storm Warnings:
 - Meeting Report of the Steering Committee of the WMO (2-7 Nov 2015);
 - Technical Report on the Asian Regional Center;
 - Science and Implementation Plan (2015-2020).

- Tropical meteorology research:
 - Proceedings of High Impact Weather Workshop;
 - Proceedings of 3rd Monsoon Heavy Rainfall Workshop (22-24 Sept 2015).
- Forecast verification research:
 - Meeting Report of the Joint Working Group on Forecast Verification Research (9-10 Sep 2015);
 - Lecture Notes of Verification Roving Seminar (17-19 Nov 2015);
 - 2015 Special Issue of Mausam on Forecast Verification.
- Numerical weather prediction (NWP):
 - Meeting Report of the 30th meeting of the Working Group for Numerical Experimentation with an overview of plans of NWP centers with global forecasting systems;
 - Proceedings of the Predictability and Dynamics of Weather Systems in the Atlantic-European Sector (PANDOWAE) Symposium published, which includes future research directions on the predictability and dynamics of mid-latitude weather systems.
- Data assimilation and observation systems (DAOS) research:
 - Meeting Report of the DAOS Working Group (27-28 October 2015).
- Societal and Economic Research Applications (SERA):
 - Meeting report of SERA /Polar Prediction Project (12-13 March 2015);
 - Report of SERA (10-11 Nov 2015) with plans for a SERA Research Project.

Atmospheric Chemistry Observations

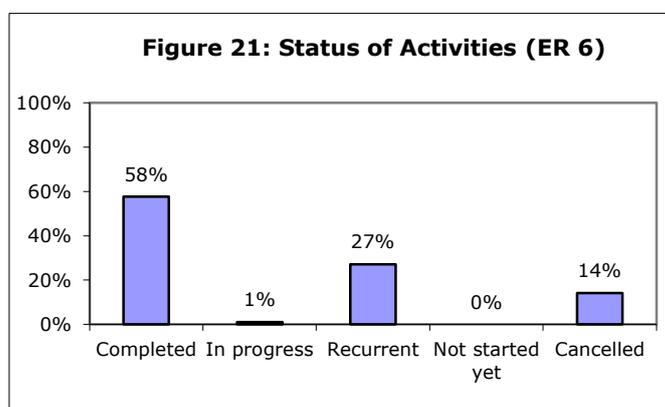
- *Greenhouse Gas Bulletin* (2015 edition), *Antarctic Ozone Bulletin* (No. 1-5 for 2015) and *GAW Aerosol Bulletin* issued;
- Workshop on Air Pollution and Agriculture conducted and proceedings published, which examined the impacts of atmospheric chemistry on agricultural production and the impacts of agriculture on the atmospheric composition, including greenhouse gases, biomass burning, reactive gases and aerosols;
- Global Atmosphere Watch Training and Education Centre (GAWTEC) training course conducted, providing scientific guidance and instructions to GAW station personnel from worldwide global and regional stations;
- Aerosol Scientific Advisory Group Meeting and Symposium on Coupled Chemistry-Meteorology/Climate Modelling organized, which presented a synthesis of scientific progress and provided recommendations for future research directions and priorities in the development, application and evaluation of online coupled models;
- Completion of the Ninth Intercomparison Campaign of the Regional Brewer Calibration Center Europe (RBCC-E);
- Draft paper on aerosol observation requirement finalized;
- 2015 Tropospheric Ozone Assessment Report finalized, which provided the research community with an up-to-date scientific assessment of tropospheric ozone's global distribution and trends from the surface to the tropopause;
- Reports, proceedings and research papers published:
 - Absorption Cross-Sections of Ozone Status Report;
 - Technical note on Analytical Methods for Atmospheric SF₆ Using Gas Chromatography with micro Electron Capture Detector (GC- μ ECD);
 - Atmospheric environment overview paper on megacities, air quality and climate;
 - Aerosol measurement procedures, guidelines and recommendations;
 - Proceedings of the WMO/UNEP Dobson Data Quality Workshop, providing guidance on how best to archive data sets and reprocess the data;

- Report of the First Meeting of the WMO GAW Task Team on Observational Requirements and Satellite Measurements as regards Atmospheric Composition and Related Physical Parameters;
- Meeting Report of the GURME Scientific Advisory Group;
- Meeting Report of the 10th CAS Management Group Meeting (22-23 Apr 2015);
- Reports of the 7th and 8th RBCC-E;
- System of Air Quality Forecasting and Research (SAFAR - India).

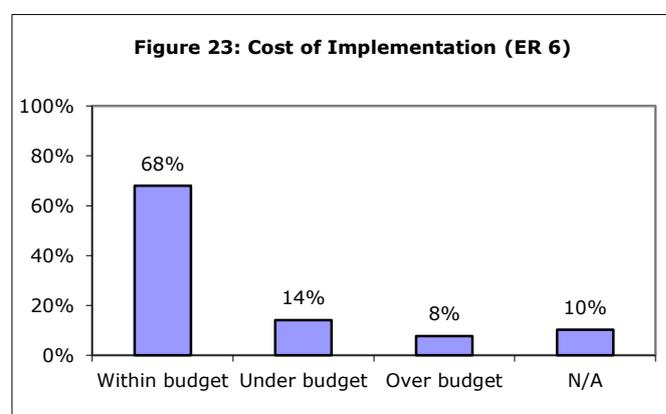
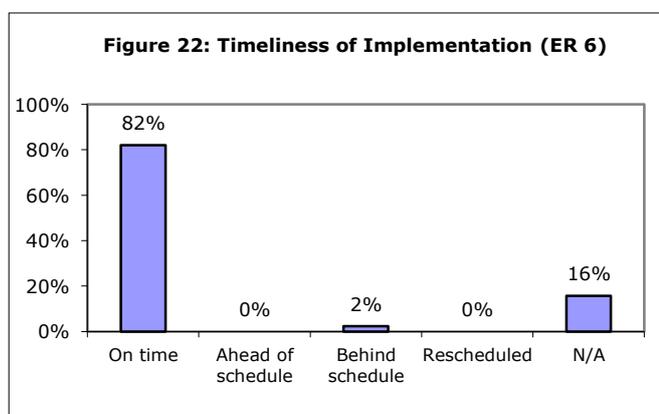
EXPECTED RESULT 6

a. Status of Activities, Timeliness and Cost

All ER 6 activities were completed or involved activities of recurrent nature, as of December 2015. Only one activity concerning the working groups of RA-I was still underway, with progress estimated at 80%; it comprised 1% of the overall ER 6 activities, as presented on Figure 21. Fourteen percent of activities were cancelled, including the organization of regional technical conferences in RA-III and RA-IV; several climate-related activities which were integrated with RCOF sessions or addressed under the new CCI working structure; and seven training courses and seminars.



As shown on Figure 22, the large majority of ER 6 activities (82%) were executed within the expected time frame. Two activities were lagging behind schedule, representing 2% of the total. These included a training seminar on curriculum development as well as the production and exchange of training materials. N/A stands for cancelled activities and a couple of recurrent activities, such as operating expenses, on both Figures 22 and 23.



In terms of expenditure, 68% of ER 6 activities were implemented within their assigned budget, as demonstrated by Figure 23. Eight percent exceeded their allocated funding, which was compensated by savings realized on 14% of activities. For instance, the meeting of the EC Panel of Experts on Education and Training and the coordination of fellowships absorbed fewer

resources than envisioned. These were used to finance deficits of other activities, such as funding of participants to attend Regional Training Centre (RTC) courses, the delivery on online trainings, and the provision of advisory services for manpower development of NMHSs.

b. Constraints/Risks

Three ER 6 activities were assigned a yellow alert status due to:

Resource constraints:

- Lack of human and financial resources to respond to the increasing number of Member requests for assistance in data rescue and digitization.

Coordination issues:

- Difficult coordination between the Observations and CSIS communities on guidance on climate monitoring and watch systems in support of GFCS implementation.

Implementation constraints:

- Urgent need to operationalize CSIS in order to provide countries where GFCS activities are underway with the tools to respond to demands for tailored products and services from users.

c. Highlights of Outputs/Deliverables

Training and Guidance

- Support provided to the 9th International Conference on Urban Climate (France, July 2015) and a NOAA workshop on Heat-Health Warning Systems (USA, July 2015).
- Training course on Manual on Stream Gauging held in Benin (July 2015) and Nepal (September-October 2015).
- Attachment Training on Tropical Cyclone Forecasting and Storm Surge Training Course combined with an International Workshop on Tropical Cyclone Forecasting and Warnings in New Delhi, India, 3-14 August 2015.
- Training of Trainers for Climate Field Schools in Indonesia held in August 2015.
- A joint meeting between CLPA and ETR experts held on using climate service competencies in identifying and developing training resources and courses (Israel, November 2015).
- A training seminar on instruments held in Argentina, November 2015.
- Coordination with UNESCO and the International Oceanographic Data and Information Exchange (IODE) undertaken.
- As a result of regional workshops on data rescue and digitization held, quality-controlled and homogenized timeseries generated in the Indian Ocean rim countries and islands and data infrastructure improved in West African NMHSs (Burkina Faso, Mali and Niger).
- Improved awareness of senior NMS staff on strategic planning and DRR matters (done in conjunction with CMA annual study tour).
- International Short-term Course on Flood Forecasting and Warning for South and Southeast Asia held (Roorkee, India, 26 October-1 November 2015).
- Training course in hurricane forecasting held in December 2015;
- Three participants sponsored to participate in Workshop on Information quality and hydrometeorological forecast – PROHIMET.
- Agreement reached to improve the availability of climate datasets in support of climate monitoring and watch for Mediterranean countries, following a series of regional workshops held.

In the figures on timeliness and cost of implementation, N/A refers to cancelled or delayed activities.

Fellowships

- 58 candidates considered at a meeting of the Fellowship Committee in November 2015. Of these, 8 were recommended for fellowships to commence in either late 2015 or January 2016. Since then, a further 6 fellows were approved for study in early 2016 under the fast track arrangements. Placements for this group of 14 fellows are in Algeria, Australia, France, Republic of Korea and the Russian Federation.
- Due to additional regular budget funding it was possible to place more fellows in 2015 than anticipated.

Regional Offices

- Report of Regional Workshops of Africa on Strategic Plan (Nairobi, Kenya and Khartoum, Sudan, November 2015) finalized.

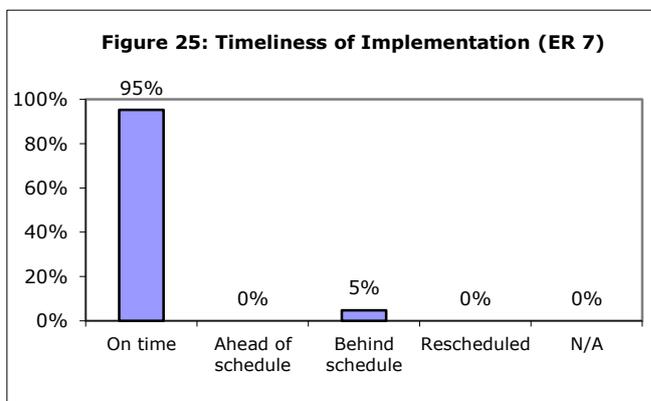
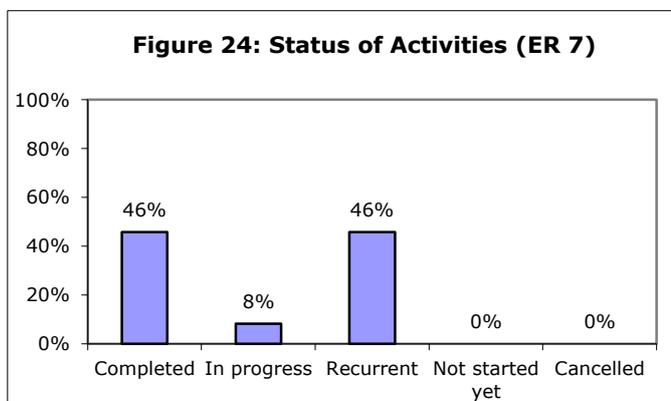
GFCS

- To support regional and national level activities, human capacity assessment needs missions were conducted at ACMAD and ICPAC. The results of the assessments are being used to identify experts who are going to be deployed by the GFCS to these centres to support their mandatory functions as regional climate centres.
- Country level implementation is progressing in Malawi and Tanzania.
- In West Africa, plan development and endorsement was completed in Niger, while Burkina Faso, Mali and Senegal are yet to endorse their plans.

EXPECTED RESULT 7

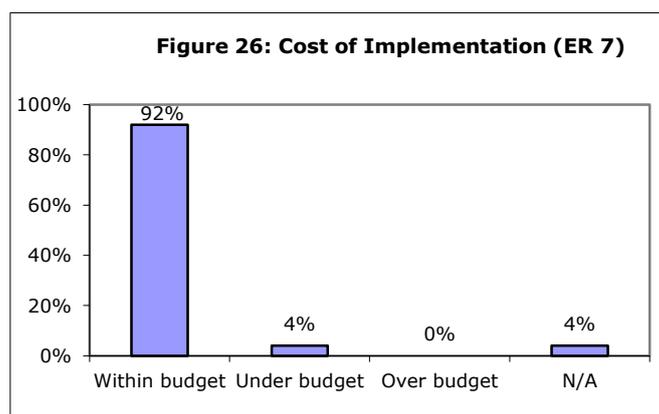
a. Status of Activities, Timeliness and Cost

All ER 7 activities were completed or recurrent as of December 2015, except two which amounted to 8% of the total, as presented on Figure 24. Both activities were however at a very advanced stage of implementation, with 90% of the work completed. The two activities included the development of climate-related guidance materials and publications (namely, publications on RCCs and NCOF/NCF operations) and "Guidance Material on Climate and Biodiversity, information products and publications on climate, drought and desertification." The latter activity also accounts for the 5% of activities behind schedule on Figure 25. All other ER 7 activities were accomplished on time.



All ER 7 activities but two were further implemented within their allotted budget, the exceptions being (1) the co-sponsorship of activities in Hydrology and Water Resources organized by NGOs and IGOs, which absorbed less resources than originally planned (see 4% of activities spending below budget in Figure 26); and (2) the WMO/UNESCO Liaison

Committee for Hydrology for which no meeting was foreseen in the reporting period and appears as N/A on Figure 26.



b. Constraints/Risks

- No risks or constraints were identified in the reporting period.

c. Highlights of Outputs/Deliverables

Leadership and Partnerships

- Inputs to ICAO Annex 3 and WMO technical regulation amendments provided;
- Participation in and contribution to:
 - o Development of the Sustainable Development Goals;
 - o UN Water Meeting (August 2015);
 - o 12th session of the Conference of the Parties (COP-12) to the United Nations Convention to Combat Desertification (October 2015);
 - o Second UN Special Thematic Session on Water and Disasters (November 2015);
 - o 21st session of the Conference of the Parties (COP-21) to the United Nations Framework Convention on Climate Change (UNFCCC), December 2015;
 - o Region I Meeting of UNESCO – IIHP.

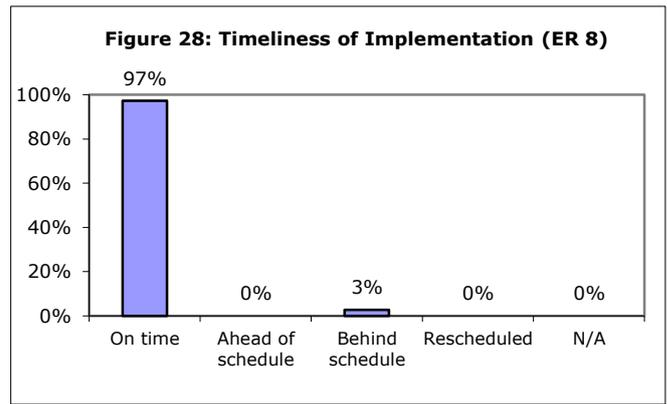
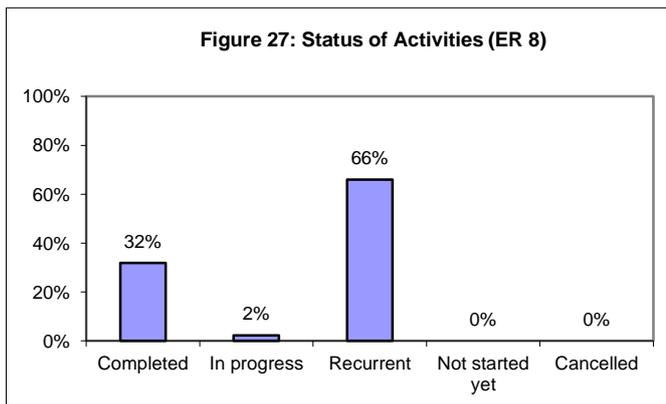
Communications and Outreach

- "Soft" launch of the new WMO website;
- Successful press launches of GHG Bulletin 2014 and preliminary WMO Statement on the Status of the Global Climate in 2015;
- Two Asian regional workshops organized for a total of 35 weather presenters (Hanoi in September and Tokyo in November 2015);
- WMO Exhibit organized at COP-21;
- Vol. 64(2) of the WMO Bulletin published;
- Launch of Series 4 with 23 "Weather Reports from 2050" plus support to 13 weather presenters at COP-21;
- Launch of El Niño update and video animation in English, French and Spanish.

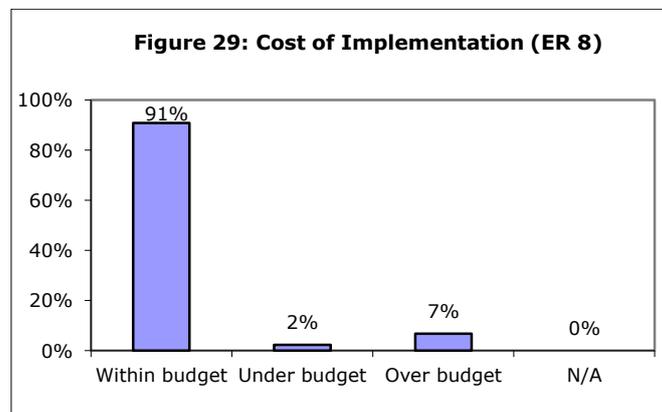
EXPECTED RESULT 8

a. Status of Activities, Timeliness and Cost

All ER 8 activities were completed or involved activities of recurrent nature, as indicated on Figure 27. Only one activity was still in progress but at an advanced stage of implementation, with estimated progress at 90%. This involved the WMO Operating Plan 2016-2019 which remained to be published as of December 2015. This one activity accounted for the 2% activities "in progress" and 3% activities "behind schedule" on Figures 27 and 28.



Whereas 91% of ER 8 activities were implemented within budget, 7% surpassed their initial allocations, as evident from Figure 29. These involved assistance to the WMO President and operating expenses as well as information and communication technology charges of the Internal Oversight Office (IOO). Excess expenditure was partially mitigated by savings realized on other IOO administrative items, which account for the 2% activities “under budget” on Figure 29.



b. Constraints/Risks

- One ER 8 activity was assigned a yellow alert status due to existing financial constraints:
 - Assistance to the WMO President.

c. Highlights of Outputs/Deliverables

Strategic Planning, Monitoring and Evaluation (M&E)

- WMO Strategic Plan 2016-2019 published in all WMO languages;
- Survey on Impacts of Achieved Results on Members conducted and a final report published;
- 25 Secretariat staff trained at a Risk Management Workshop in November 2015;
- A review of the WMO Risk Management Framework and Policy initiated.

Global Framework for Climate Services

- 3rd session of the Partner Advisory Committee and the Management Committee of the Intergovernmental Board on Climate Services held (Geneva, 22-23 October and 26-28 October 2015, respectively).

Conference, Interpretation and Documentation Services

- Conference and/or interpretation services provided to 25 meetings of IPCC, WCRP, GCOS and other extra-budgetary programmes;
- In the absence of any constituent body meetings, services were focused on the translation and revision of publications, correspondence and other regular materials.

WMO publications and other written material

- 12 numbered publications and 22 flyers/brochures/posters and other publication products were issued in a total of 52 language versions, all designed to promote WMO branding.
- 295 copies of 60 different titles were sold, with the following distribution by language:
 - o English: 175 copies;
 - o French: 8 copies;
 - o Russian: 10 copies;
 - o Spanish: 20 copies;
 - o Chinese: 0 copies;
 - o Arabic: 0 copies;
 - o Multilingual: 82 copies.

ANNEX 1:

LIST OF EXPECTED RESULTS

- ER 1: Enhanced capabilities of Members to deliver and improve access to high-quality weather, climate, water and related environmental predictions, information, warnings and services in response to users' needs, and to enable their use in decision-making by relevant societal sectors
- ER 2: Enhanced capabilities of Members to reduce risks and potential impacts of hazards caused by weather, climate, water and related environmental elements
- ER 3: Enhanced capabilities of Members to produce better weather, climate, water and related environmental information, predictions and warnings to support in particular disaster risk reduction and climate impact and adaptation strategies
- ER 4: Enhanced capabilities of Members to access, develop, implement and use integrated and interoperable Earth- and space-based observation systems for weather, climate and hydrological observations, as well as related environmental and space weather observations, based on world standards set by WMO
- ER 5: Enhanced capabilities of Members to contribute to and draw benefits from the global research capacity for weather, climate, water and the related environmental science and technology development
- ER 6: Enhanced capabilities of NMHSs, in particular in developing and least developed countries, to fulfill their mandates
- ER 7: New and strengthened partnerships and cooperation activities to improve NMHSs' performance in delivering services and to increase the value of the contributions of WMO within the United Nations system, relevant international conventions and national strategic issues
- ER 8: An effective and efficient Organization