



**AGENDA ITEM 6 : WMO FELLOWSHIP PROGRAMME, TRAINING
ACTIVITIES AND REGIONAL TRAINING CENTRES**

THE PANEL ARE INVITED TO:

- (a) Review implementation of education and training activities;
- (b) Make recommendations on how to enhance future implementation with special focus on resource mobilization and partnerships;
- (c) Review the report on impact assessment of WMO fellowships;
- (d) Make recommendations on how to strengthen the fellowships programme;
- (e) Review and comment on the status of the WMO Regional Training Centers
- (f) Consider the designation of "Agencia Estatal de Meteorología" (AEMET) of Spain as a WMO RTC in Spain;
- (g) Consider the designation of the "Facultad de Ingeniería y Ciencias Hídricas" (FICH) of the "Universidad Nacional del Litoral" (UNL) of Argentina as the third component of the WMO RTC in Argentina;
- (h) Consider the designation of the "Servicio Nacional de Meteorología e Hidrología" (SENAMHI) of Peru as the second component of the WMO RTCs in Peru;
- (i) Extend the reconfirmation of the WMO RTCs in Algeria, Indonesia, Israel, Kenya, Madagascar, Nigeria, Peru, Philippines, Russian Federation, South Africa, and Turkey, until subsequent EC decisions following the conclusions of ongoing and the next external reviews by the EC Panel;
- (j) Discuss options for follow up on progress on RTC recommendations outside of the normal External Assessment processes;
- (k) Review the external assessment programme and volunteer services to convene one or more external assessment process;
- (l) Propose new publications and reports;
- (m) Make proposal on how to assist Regional Training Centres with publications.

Items for Discussion :

6.1 Fellowships Programme

Since the last Panel meeting in 2016, the following developments have occurred

- 1) Increased emphases on operational training by using extra- budgetary fund to organize group training courses for instruments calibration and maintenance for 4 consecutive years from 2013-2016. In 2017 ran a group training on Urban meteorology with cooperation with University of Reading Malaysia campus.
- 2) Development of memoranda of understanding with new partners to supplement WMO regular fund, diversify opportunities and create more robust network of partners. Up to date, ETR updated or is updating MoUs with CSC (China Scholarship Council)
- 3) Improved internal coordination with technical departments through establishment of the Education and Training Committee (ETCOM)

	MoU or agreement	Host Member	Year of signature	Major	Comments
1	Ministry of Education, China	China	2018(TBD)	Meteorology and Hydrology	15 full scholarship BSc. MSc and PhD
2	Nanjing University of Information Science and technology	China	2016	Meteorology	15 full scholarship MSc and PhD.
3	Hohai University	China	2016	Hydrology	20 full scholarship MSc
4	DPRI, Kyoto University	Janpan	2017	Meteorology, research oriented	3 full scholarship for up to 6 months
5	ENM	France	2014	Meteorology	Mainly for francophone Members
6	Ewha Womens University	Korea	2016	Meteorology	3 MSc fellows, waive tuition fee
7	Leibenz University Hanover	Germany	2012	Hydrology	Up to 2 MSc Review in progress
8	IHE Delft	Netherlands	2017	Hydrology	Up to 3 MSc, tuition waive
9	RSHU	Russia	2016	Meteorology, Hydrology, and Environment	Up to 5 BSc, MSc tuition waive
10	ECMWF	United Kingdom	2014	Meteorology, research oriented	Attachment work up to 1 year
11	University of Reading	United Kingdom	2017	Meteorology	Up to 5 MSc 10% tuition reduction

Fellowship programme remains the key avenue to support capacity development in least developed and developing countries

2016 fellowship statistics

	Request by region	awarded by region	awarded in each region%	region awarded/global awarded%	Female request by region	Female request in each region%	Female awarded by region	Female awarded by female request in each region %
I	113	44	39%	56%	22	19%	10	45%
II	20	9	45%	12%	13	65%	7	54%
III	21	14	67%	18%	4	19%	2	50%
IV	14	7	50%	9%	7	50%	4	57%
V	12	3	25%	4%	5	42%	2	40%
VI	1	1	100%	1%	1	100%	1	100%
Total	181	78	43%	100%	52	29%	26	50%

2017 fellowship statistics as per 31 Dec 2017

	Request by region	Awarded by region	awarded in each region%	region awarded/global awarded%	Female request by region	Female request in each region%	Female awarded by region	Female awarded by female request in each region %
I	158	63	40%	52%	34	22%	11	32%
II	47	20	43%	17%	17	36%	9	53%
III	28	20	71%	17%	8	29%	7	88%
IV	14	8	57%	7%	3	21%	2	67%
V	21	8	38%	7%	3	14%	2	67%
VI	2	2	100%	2%	0	0%	0	0%
Total	270	121	45%	100%	65	24%	31	48%

- 4) Updating fellowship publications by updating the Manual on Policies and Procedures for WMO Fellowships (WMO/TD-No. 1356) and Guidelines for Applying for a WMO Fellowships (WMO-No.1104) and create an updated document that focuses on both fellowships and training. Updated the "Guide for WMO Fellows" (version Jan 2018).
- 5) Streamlined award process by re-emphasizing the need for candidates to obtain admission on merit, and go through competitive screening. This step insures the quality of the fellowship requirement in terms of academic background and learning language checking etc. ETR has consulted with all the fellowship partners, up to know all the cooperation partners agreed on the pre-admission procedure.
- 6) Updated EC criteria on award of fellowships and training sponsorships by Decision 10.1/4 (EC-69), which includes
 1. Criteria for the award of WMO fellowships
 2. Criteria for the award of WMO short-term training opportunities

3. Criteria for consideration of requests for a familiarization visit by recently appointed Permanent Representative (PR) of a country with WMO

7) Promotion of gender balance

a) . WMO has a MoU since 2012 with EHWA Womens University in Seoul , South Korea which is a dedicated women university to promote and enhance the education opportunities for female candidates.

b). In EC criteria for ETR opportunities adopted by EC69 in 2017, especially added the sentence that " The need to practice equal opportunity policies (Resolution 33 (Cg-XIV) – Equal opportunities for the participation of women in meteorology and hydrology.

c)In WMO annual SG circular letter calling for nomination for ETR opportunities, the gender equality policy is emphasized each time.

d)Extra points for females fellowship candidates are added when considering fellowship opportunities.

e)The gender stream policy is also included in the November 2017 WMO SYMETXIII statement, which said, "As the WMO Education and Training community works with students from many countries, language, gender and cultural awareness needs to be addressed across all activities. .

f)In each and every ETR statics and survey, female fellows and nominations are especially mentioned to raise the awareness for female candidates opportunities.

8) Involvement of fellows in professional conferences

- a. Attend CMATC's 4-month forecaster's course after graduation from NUIST and Hohai University's academic study.
- b. Attend the UK Meteorological Society's annual student conference
- c. Attend the Beijing Climate Centre's annual summer school on climate science and climate changes.

9) Enhanced internal in-house coordination with WMO technical departments by set up the ETCOM on the bases of former FELCOM, and draft the *Procedures for Interdepartmental Collaboration in the Organization and Implementation WMO Education and Training Events*

6.2 WMO Fellowships Impacts Evaluation¹

The 68th session of the WMO Executive Council held in Geneva in June 2016 adopted Decision 10.2/4 to carry out an impact evaluation of the Programme to quantify the benefits accrued through fellowships to the Members with the aim of making a case for enhanced delivery of the Programme and improved efficacy. Amongst other things, the evaluation gave consideration to: i) effectiveness of delivery of the Programme in each WMO Region; ii) effectiveness in addressing areas of current and emerging demand in each WMO Region; iii) building of North-South and South-South partnerships to expand training opportunities, and vi) allocation of resources among Regions and priority areas within Regions.

From the analysis undertaken and the report produced (see link to full report), the fellowship programme has been found to be very positive and effective in its delivery at the national, regional and global levels. In view of this, it can be concluded that the programme is needed today more than ever before by the NMHSs of developing Member countries in order to continue to contribute effectively the sustainable development of their nations and the world at large. Indeed, due to the increasing demand in training and specific needs, especially in least developed and developing countries, and Small Island Developed States, it has remained a very relevant Programme to the Members.

The panel is invited to discuss impact evaluation report and make recommendation to EC and Congress.

6.3 Training Activities Division

The WMO Education and Training Office, Training Activities Division, was able to offer support to 111 experts from 35 Members in 6 Regions.

As shown in Figures 1 and 2 below, the numbers of requests for financial supports for short-term courses were increased in 2017, where the ratio of awarded supports were decreased. Although the numbers of awarded females are still low and remain the same, 27, the ratio slightly increased from 22% to 24% because of the decrease in the numbers of awarded males from 97 to 84 in 2017.

The WMO 2017 Online Course for Trainers, offered in English for RA-II Asia and RA-IV Pacific, with 46 participants receiving certificates of completion. This offering completes the circuit of all regions, delivered in English, French, Russian, and Spanish. The 2016 Online Course for Trainers for RA-III and RA-IV saw 57 participants receiving certificates. The WMO Training Development Workshop, the face-to-face follow-on to the online course served 21 participants in 2016 in Argentina, and 18 participants in 2017 in Australia.

¹ References:

[Decision 67 \(EC-68\)](#) on Fellowships Impact Evaluation.pdf
[Final Report](#) of Impact Evaluation of the WMO Fellowship Programme

Figures 1 and 2: 2016 and 2017 Requests and Awards by Gender

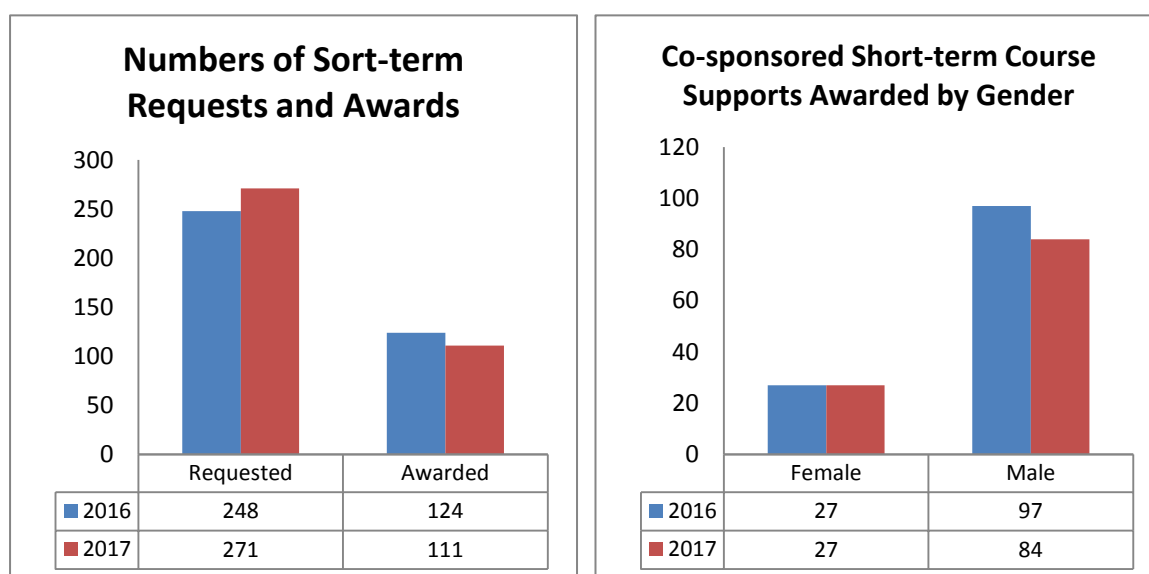


Table 1 shows the distribution of the sort-term course support award by Regions in 2016, where Africa (60%), Asia (17%) and South-east Europe (17%) received the greatest number of awards.

Table 1: 2016 Short-Term Support by Region and Gender

Region	Female		Male		Total	%
I	12	16%	61	84%	73	59%
II	7	33%	14	67%	21	17%
III		0%	1	100%	1	1%
IV	1	50%	1	50%	2	2%
V	2	40%	3	60%	5	4%
VI	5	23%	17	77%	22	18%
Total	27	22%	97	78%	124	100%

Although the same Regions (I, II, and VI) received greatest supports, below table shows the increase in Asia (34%) in 2017.

Table 2: 2017 Short-Term Support by Region and Gender

Region	Female		Male		Total	%
I	13	22%	45	78%	58	52%
II	8	21%	30	79%	38	34%
III		0%	1	100%	1	1%
IV		0%	1	100%	1	1%
V	1	100%		0%	1	1%
VI	5	42%	7	58%	12	11%
Total	27	24%	84	76%	111	100%

The following tables in Annexes show the co-sponsored courses offered by RTCs and other training partners and the number of awarded participants by Member for each course offered. As the number of awarded participants for course offered by MeteoFrance compose approximately 70% of the awards, they are shown in separate tables.

nnex-I: Awarded participants in 2016 for co-sponsored short courses offered by RTCs and other training partners

Climate Change and Agriculture, Shefayim, Israel, 4-14 April 2016	6
British Caribbean Territories (1), Burundi (1), Ethiopia (1), Ghana (1), Myanmar (1), The former Yugoslav Republic of Macedonia (1)	
Global Framework for Climate Services (GFCS), Beijing, China, 5-15 April 2016	4
Bahamas (1), Bhutan (1), Thailand (1), United Republic of Tanzania (1)	
Observing Systems, Ankara, Turkey, 11-15 April 2016	0
Weather Radar Data Utilization for Meteorological Services, Seoul, Republic of Korea, 17 April-7 May 2016	0
Meteorological Communication, Data Processing, and TURKMETCAP, Alanya, Turkey, 25-29 April 2016	1
Kazakhstan (1)	
Nowcasting Techniques on Thunderstorm and Severe Convection, Beijing, China, 23 May-3 June 2016	2
Bhutan (1), Pakistan (1)	
Application of Meteorological Satellite Products, Beijing, China, 20 June-1 July 2016	3
Malaysia (1), Myanmar (1), Pakistan (1)	
Weather Forecasting for Operational Meteorologists, Seoul, Republic of Korea, 11-29 July 2016	2
Indonesia (1), Thailand (1)	
Agrometeorology, Beijing, China, 12-23 September 2016	3
Ethiopia (1), Guinea (1), Uganda (1)	
Basics of Calibration, Ankara, Turkey, 3-7 October 2016	2
Ukraine (1), Uzbekistan (1)	
Aeronautical Meteorology Services, Beijing, China, 24 October-4 November 2016	4
Iran, Islamic Republic of (1), Mozambique (1), Papua New Guinea (1), Swaziland (1)	
Workshop on Aviation Meteorology for Forecasters, Doha, Qatar, 6-10 November 2016	4
Bhutan (1), Lao People's Democratic Republic (1), Pakistan (1), Philippines (1)	
Radar Meteorology, Nanjing, China, 14-25 November 2016	5
Armenia (1), State of Palestine (3), Uganda (1)	
Tropical Cyclones, Nanjing, China, 21 November-2 December 2016	4
Mozambique (1), Papua New Guinea (1), Philippines (1), Yemen (1)	
Use and Interpretation of Mesoscale NWP for High-Impact Weather Forecasting, Hong Kong, China, 5-9 December 2016	2
Argentina (1), Kazakhstan (1)	
Grand Total	42

Annex-II: Awarded participants in 2016 for co-sponsored short courses offered by MeteoFrance

Climate Change, Toulouse, France, 14-17 March 2016	2
Guinea-Bissau (1), Mauritania (1)	
Climatology, foundation for climate services of the Ecole Nationale de la Meteorology (ENM), Toulouse, France, 30 May - 10 June 2016	18
Benin (1), Bosnia and Herzegovina (1), Ethiopia (1), Madagascar (2), Nigeria (1), Pakistan (2), Russian Federation (1), Sierra Leone (1), South Sudan (1), Spain (1), Thailand (1), The former Yugoslav Republic of Macedonia (2), Togo (1), Tunisia (1), Ukraine (1)	
Concepts and methods for weather forecasting à Météo-France, Toulouse, France, 19-30 September 2016	7
Benin (1), Côte d'Ivoire (1), Mauritania (1), Morocco (1), Togo (2), Tunisia (1)	
Elements de télédetection depuis l'espace, Lannion, France, 26-30 September 2016	7
Comoros (1), Congo (1), Lebanon (1), Morocco (2), Togo (1), Tunisia (1)	
International Training Course on Aeronautical Meteorology, Toulouse, France, 3-14 October 2016	3
Cameroon (1), Morocco (1), Tunisia (1)	
Meteorologie Aéronautique à Météo-France, Toulouse, France, 19-30 September 2016	1
Madagascar (1)	
Meteorologie Marine à Météo-France, Toulouse, France, 7-18 November 2016	8
Algeria (1), Benin (1), Côte d'Ivoire (1), Madagascar (1), Morocco (1), Togo (3)	
Meteorologie Modulaire à Météo-France, Toulouse, France, 14-18 November 2016	1
Togo (1)	
Satellite Weather Forecasting for forecasters Météo-France, Toulouse, France, 21-25 November 2016	9
Algeria (1), Burkina Faso (1), Cameroon (1), Congo (1), Guinea-Bissau (1), Mauritania (1), Morocco (1), Senegal (1), Togo (1)	
Techniques et organisation de la prévision à Météo-France, Toulouse, France, 12-16 September 2016	14
Algeria (1), Burundi (1), Comoros (1), Gabon (1), Guinea-Bissau (2), Lebanon (1), Madagascar (1), Malaysia (1), Morocco (1), Sao Tome and Principe (1), Togo (1), Tunisia (1), Ukraine (1)	
Training Weather forecasting in mid latitude regions mod 1 and mod 2, Toulouse, France, 28 November to 9 December 2016	12
Algeria (1), Belarus (1), Côte d'Ivoire (1), Egypt (1), Georgia (1), Latvia (1), Mauritania (1), Morocco (1), Pakistan (1), Russian Federation (1), The former Yugoslav Republic of Macedonia (1), Ukraine (1)	
Grand Total	82

Annex-III: Awarded participants in 2017 for co-sponsored short courses offered by RTCs and other training partners

Advanced Workshop on "Meteorological Warnings"	1
Ukraine (1)	
Climate Change and Agriculture	3

Benin (1), Comoros (1), The former Yugoslav Republic of Macedonia (1)	
Climate Services for Disaster Prevention	2
Benin (2)	
Course on Global Framework for Climate Services (GFCS)	1
Ukraine (1)	
Course on the Application of Meteorological Satellite Products	5
Curaçao and Sint Maarten (1), Democratic Republic of the Congo (1), Iraq (2), Tajikistan (1)	
International Training Course on "Numerical Weather Prediction"	1
Venezuela, Bolivarian Republic of (1)	
The International Training Course on Aeronautical Meteorology Services	1
Tajikistan (1)	
Upper Air Observing Systems	1
Gambia (1)	
Urban Meteorology, Environment and Climate Services	10
China (1), India (1), Iraq (1), Mongolia (1), Philippines (1), Poland (1), Singapore (1), Sri Lanka (1), Thailand (1), Uzbekistan (1)	
Workshop on Implementation of ICAO Met Info Exchange Model	2
Iraq (1), Thailand (1)	
Weather Forecasting for Forecasters	4
Iraq (4)	
Surface Observation Course	2
Iraq (2)	
Grand Total	33

Annex-IV: Awarded participants in 2017 for co-sponsored short courses offered by MeteoFrance

Assimilation of GPS data in the ARPEGE and AROME models	2
Morocco (1), Tunisia (1)	
Changement Climatique	1
Morocco (1)	
Climatologie Foundation for Climate Services	13
Algeria (1), Benin (1), Burkina Faso (1), Côte d'Ivoire (1), Democratic Republic of the Congo (1), Guinea (1), Guinea-Bissau (1), Madagascar (2), Mali (1), Mauritania (1), Morocco (1), Togo (1)	
Concepts and Methods for Forecasting	1
Tunisia (1)	
Concepts and Methods for Weather Forecasting	4
Algeria (1), Benin (1), Morocco (2)	
Elements of remote detection from space	11

Algeria (1), Benin (1), Congo (1), Côte d'Ivoire, (1), Lebanon (1), Mauritania (1), Morocco (1), Senegal (1), Togo (1), Tunisia (2)	
Meteorologie Aeronautique	3
Cameroon (1), Madagascar (1), Morocco (1)	
Meteorologie Marine	6
Algeria (1), Côte d'Ivoire (1), Madagascar (1), Morocco (1), Senega (1), Togo (1)	
Météorologie Zone Afrique pour prévisionnistes	7
Burkina Faso (1), Cameroon (1), Côte d'Ivoire (1), Guinea (1), Madagascar (1), Mali (1), Mauritania (1)	
Modular Meteorology	4
Democratic Republic of the Congo (1), Togo (1), Tunisia (2)	
Satellite Weather Forecasting for Forecasters	9
Algeria (1), Benin (1), Comoros (1), Côte d'Ivoire (1), Democratic Republic of the Congo (1), Gabon, (1), Lebanon (1), Morocco (1), Tunisia (1)	
Techniques et organisation de la prevision	4
Algeria (1), Cameroon (1), Morocco (1), Tunisia (1)	
Tropical Meteorology	2
Benin (1), Togo (1)	
Weather Forecasting in Mid-latitude Regions	5
Morocco (1), The former Yugoslav Republic of Macedonia (1), Tunisia, (1), Ukraine (1), Egypt (1)	
Workshop on WMO Information System	6
Armenia (1), Georgia (1), Morocco (1), Senegal (1), Ukraine (1), United Republic of Tanzania (1)	
Grand Total	78

Annex-V: Co-sponsored short courses advertised and/or supported by ETR Office in 2016

China-CMATC	Nowcasting Techniques on Thunderstorm and Severe Convection, Beijing	23-May-2016	3-Jun-2016
China-CMATC	Aeronautical Meteorology Services, Beijing	24-Oct-2016	4-Nov-2016
China-CMATC	Agrometeorology, Beijing	12-Sep-2016	23-Sep-2016
China-CMATC	Global Framework for Climate Services (GFCS), Beijing	5-Apr-2016	15-Apr-2016
China-CMATC	Application of Meteorological Satellite Products, Beijing	20-Jun-2016	1-Jul-2016
China-NUIST	Radar Meteorology, Nanjing	14-Nov-2016	25-Nov-2016
China-NUIST	Tropical Cyclones, Nanjing	21-Nov-2016	2-Dec-2016
Hong Kong China-HKO	Use and Interpretation of Mesoscale Numerical Weather Prediction (NWP) for High-Impact Weather Forecasting	5-Dec-2016	9-Dec-2016
Israel-PTCAM	Climate Change and Agriculture, Shefayim	4-Apr-2016	14-Apr-2016
Korea-KMA	Weather Forecasting for Operational Meteorologists, Seoul	11-Jul-2016	29-Jul-2016
Korea-KMA	Weather Radar Data Utilization for Meteorological Services, Seoul	17-Apr-2016	7-May-2016
Qatar-QAC	Workshop on Aviation Meteorology for Forecasters, Doha	6-Nov-2016	10-Nov-2016
Turkey-TSMS	Observing Systems, Ankara	11-Apr-2016	15-Apr-2016
Turkey-TSMS	Meteorological Communication, Data Processing, and TURKMETCAP, Alanya	25-Apr-2016	29-Apr-2016
Turkey-TSMS	Basics of Calibration, Ankara	3-Oct-2016	7-Oct-2016

Annex-VI: Co-sponsored short courses advertised and/or supported by ETR Office in 2017

China-CMATC	Course on Global Framework for Climate Services (GFCS)	17-Apr-2017	28-Apr-2017
China-CMATC	Course on the Application of Meteorological Satellite Products	5-Jun-2017	16-Jun-2017
China-CMATC	The International Training Course on Aeronautical Meteorology Services	11-Sep-2017	22-Sep-2017
China-CMATC	International Training Course on the Adaptation to Climate Change	12-Oct-2017	25-Oct-2017
China-NUIST	International Training Course on Tropical Cyclone	13-Nov-2017	24-Nov-2017
China-NUIST	International Training Course on "Numerical Weather Prediction"	20-Nov-2017	1-Dec-2017
Egypt-EMA	Weather Forecasting for Forecasters	5-Nov-2017	16-Nov-2017
Egypt-EMA	Surface Observation Course	19-Nov-2017	30-Nov-2017
France-ENM	Climatologie Foundation for Climate Services	20-Feb-2017	3-Mar-2017
France-ENM	Changement Climatique	6-Mar-2017	9-Mar-2017
France-ENM	Concepts and Methods for Weather Forecasting	6-Mar-2017	17-Mar-2017
France-ENM	Tropical Meteorology	20-Mar-2017	30-Mar-2017
France-ENM	Météorologie Zone Afrique pour prévisionnistes	12-Jun-2017	16-Jun-2017
France-ENM	Techniques et organisation de la prévision	19-Jun-2017	23-Jun-2017
France-ENM	Workshop on WMO Information System	29-Jun-2017	30-Jun-2017
France-ENM	Concepts and Methods for Forecasting	18-Sep-2017	29-Sep-2017
France-ENM	Elements of remote detection from space	25-Sep-2017	29-Sep-2017
France-ENM	Meteorologie Marine	6-Nov-2017	16-Nov-2017
France-ENM	Modular Meteorology	14-Nov-2017	18-Nov-2017
France-ENM	Satellite Weather Forecasting for Forecasters	20-Nov-2017	24-Nov-2017
France-ENM	Assimilation of GPS data in the ARPEGE and AROME models	20-Nov-2017	1-Dec-2017
France-ENM	Weather Forecasting in Mid-latitude Regions	27-Nov-2017	8-Dec-2017
Germany-DWD BTZ	1st OSCAR/Surface Training Course for RA VI	23-May-2017	24-May-2017
Germany-DWD BTZ	Weather Radar Applications in Nowcasting for Weather Forecasters	29-May-2017	2-Jun-2017
Hong Kong China-HKO	Workshop on Implementation of ICAO Met Information Exchange Model	10-Oct-2017	12-Oct-2017
Iran-IRIMO	Atmospheric Hazards in Aviation	25-Feb-2017	1-Mar-2017
Israel-PTCAM	Climate Change and Agriculture	14-May-2017	24-May-2017
Israel-PTCAM	Advanced Workshop on "Meteorological Warnings"	6-Nov-2017	16-Nov-2017
Italy-IBIMET	Climate Services for Disaster Prevention	20-Nov-2017	1-Dec-2017
Korea-KMA	Weather Forecasting for Operational Meteorologists	6-Feb-2017	24-Feb-2017
Korea-KMA	Course on Weather Radar Operations	12-Jun-2017	23-Jun-2017
Korea-KMA	International Training Course for Leaders of RA I	5-Nov-2017	9-Nov-2017
Peru-UNALM	International Training Course on Seasonal Climate Forecast	29-Mar-2017	29-May-2017
Turkey-TSMS	MetcapPlus Visualization Package and TAC2BUFR Software	24-Apr-2017	28-Apr-2017
Turkey-TSMS	Upper Air Observing Systems	16-Oct-17	20-Oct-2017
Turkey-TSMS	Operation and Maintenance of Radar Systems	6-Nov-2017	10-Nov-2017
Turkey-TSMS	AWOS Installation, Maintenance and Operation	13-Nov-2017	17-Nov-2017
UK-Reading University	Urban Meteorology, Environment and Climate Services	28-Aug-2017	8-Sep-2017

6.4 Status of WMO Regional Training Centres²

The WMO ETR Office tracks the performance of its WMO Regional Training Centers based on the annual reports provided to the office each year from each RTC component (38). The majority of centers provide them, but as of the drafting of this document, 17 had not submitted their reports (see Table 1 in References). Five components have not submitted reports in the last four years, and another five have failed to submit at least 2 of the 4 expected reports. It is expected that these are among the least active RTCs, and that therefore this does not change the total statistics very much. Additional reports may arrive before the Panel Meeting, and this paper will be updated.

In 2017, the WMO RTC network supported a total of 2,553 international participants, 820 in long term courses and Fellowships, and 1104 in short courses, and 629 in distance learning courses (short or long). (See Table 3) Most of these support figures are stable or show upward movement for the last four years (see table below). The slight decline in support from 2016 to 2017 may be related to budgets.

In regards to gender balance in 2017, total percentages were 42% female, and 58 % male. This is probably a bit higher than the percentage of females employed by NMHSs. As shown in Figure 3, this balance is not equal across course type. For short-term courses, 28% of participants were female, for long-term courses, 45% were female, and for distance learning courses, 60% were female.

Figure 4 shows that course offerings in 2017, 43% were short-term, 32% were long term, and 25% were distance learning. Both gender balance and use of distance learning show positive growth over the last 4 years, as show in the table below. Note that distance learning is used much more for national participants than for international participants. Only nine RTC components are using distance learning for regional or international training, including components in Argentina, India, Italy, Kenya, Russian Federation, and South Africa.

Participants Served, Trends for 2014-2017

	2014	2015	2016	2017
International support (total)	1897	1793	2629	2553
Long-term training	(90 courses)	(158 courses)	820	820
Short-term training	(216 courses)	(166 courses)	1310	1104
Distance learning (all forms)	NA	381	499	629
Females supported (all courses)	NA	35%	34%	42%

Additional information on distribution of courses over the WMO priority areas and additional non-training activities carried out by the RTCs will be provided at the meeting.

² Reference:

[2016-2017 RTC Annual Reports.docx](#)

Table 1: Submission of RTC Annual Reports between 2014-2017

RTC Hosting WMO Member	City	Component	2014	2015	2016	2017	Nr. of Reports	Reportmeter
Algeria	Oran	IHFR	Yes	Yes	Yes	Yes	4	
Argentina	Buenos Aires	SMN	Yes	Yes	Yes	Yes	4	
China	Nanjing	NUIST	Yes	Yes	Yes	Yes	4	
China	Beijing	CMATC	Yes	Yes	Yes	Yes	4	
Egypt	Cairo	EMA	Yes	Yes	Yes	Yes	4	
India	Pune	NWA	Yes	Yes	Yes	Yes	4	
Indonesia	Jakarta	BMKG	Yes	Yes	Yes	Yes	4	
Iran, Islamic Republic of	Tehran	IRIMO	Yes	Yes	Yes	Yes	4	
Israel	Bet Dagan	PTCAM	Yes	Yes	Yes	Yes	4	
Italy	Florence	IBIMET	Yes	Yes	Yes	Yes	4	
Kenya	Nairobi	IMTR	Yes	Yes	Yes	Yes	4	
Kenya	Nairobi	UONBI	Yes	Yes	Yes	Yes	4	
Madagascar	Antananarivo	ESPA	Yes	Yes	Yes	Yes	4	
Madagascar	Antananarivo	ENEAM	Yes	Yes	Yes	Yes	4	
Peru	Lima	UNALM	Yes	Yes	Yes	Yes	4	
Philippines	Quezon City	PAGASA	Yes	Yes	Yes	Yes	4	
Qatar	Doha	QAC	Yes	Yes	Yes	Yes	4	
Russian Federation	Moscow	ATI	Yes	Yes	Yes	Yes	4	
Russian Federation	Saint Petersburg	RSHU	Yes	Yes	Yes	Yes	4	
Russian Federation	Moscow	MGMTEH	Yes	Yes	Yes	Yes	4	
South Africa	Pretoria	SAWS	Yes	Yes	Yes	Yes	4	
Turkey	Ankara	TSMS	Yes	Yes	Yes	Yes	4	
Argentina	Buenos Aires	UBA	No	Yes	Yes	Yes	3	
Philippines	Quezon City	UP	No	Yes	Yes	Yes	3	
Nigeria	Akure	FUTA	Yes	No	Yes	Yes	3	
Nigeria	Lagos	MRTI	No	Yes	Yes	Yes	3	
Barbados	Bridgetown	CIMH	Yes	Yes	Yes	No	3	
Uzbekistan	Tashkent	THMPC	Yes	Yes	Yes	No	3	
Republic of Korea	Seoul	KMA	n/a	No	Yes	Yes	2	
Costa Rica	San Jose	UCR	Yes	No	No	Yes	2	
India	Pune	MTI	Yes	No	No	Yes	2	
Iraq	Baghdad	IMO	No	No	No	Yes	1	
Niger	Niamey	EAMAC	No	No	Yes	No	1	
Angola	Luanda	INAMET	No	No	No	No	0	
Brazil	CVEM	UFPA	No	No	No	No	0	
India	Roorkee	IITR	n/a	No	No	No	0	
Niger	Niamey	AGRHYMET	No	No	No	No	0	
Indonesia	Bandung	RCWR	No	No	No	No	0	
Venezuela, Bolivarian Republic of	Caracas	UCV	No	No	No	No	0	

Table 2: International Trainees Trained by WMO RTCs in 2016

Country	City	RTC	2016 Report	Long-term Courses					Short-term Courses					DL Courses		
				Nr. of Courses	Int. Participants			Certificates	Nr. of Courses	Int. Participants			Nr. of Courses	Int. Participants		
					TOTAL	Female	Male			TOTAL	Female	Male		TOTAL	Female	Male
Algeria	Oran	IHFR	Yes	3	125	40	85	72	1	60	10	50	0	0	0	0
Angola	Luanda	INAMET	No													
Argentina	Buenos Aires	UBA	Yes	3	12	4	8	0	2	23	8	15	2	1	0	1
Argentina	Buenos Aires	SMN	Yes	0	0	0	0	0	5	18	9	9	3	74	22	52
Barbados	Bridgetown	CIMH	Yes	6	55	31	24	14	5	125	55	70	5	75	33	42
Brazil	CVEM	UFPA	No													
China	Nanjing	NUIST	Yes	3	60	3	57	15	11	247	80	167	0	0	0	0
China	Beijing	CMATC	Yes	1	2	0	2	2	4	64	17	47	3	43	12	31
Costa Rica	San Jose	UCR	No													
Egypt	Cairo	EMA	Yes	1	0	0	0	0	16	12	2	10	0	0	0	0
India	Pune	MTI	No													
India	Pune	NWA	Yes	0	0	0	0	0	0	0	0	0	2	0	0	0
India	Roorkee	IITR	No													
Indonesia	Bandung	RCWR	No													
Indonesia	Jakarta	BMKG	Yes	4	0	0	0	0	7	26	10	16	0	0	0	0
Iran, Islamic Republic of	Tehran	IRIMO	Yes	2	3	0	3	3	11	1	1	0	0	0	0	0
Iraq	Baghdad	IMO	No													
Israel	Bet Dagan	PTCAM	Yes	0	0	0	0	0	1	23	7	16	0	0	0	0
Italy	Florence	IBIMET	Yes	0	0	0	0	0	1	23	9	14	1	29	11	18
Kenya	Nairobi	IMTR	Yes	6	19	4	15	19	5	229	31	198	2	16	1	15
Kenya	Nairobi	UONBI	Yes	10	31	11	20	7	0	0	0	0	10	1	0	1
Madagascar	Antananarivo	ESPA	Yes	2	15	3	12	6	0	0	0	0	0	0	0	0
Madagascar	Antananarivo	ENEAM	Yes	1	0	0	0	0	0	0	0	0	0	0	0	0
Niger	Niamey	EAMAC	Yes	6	107	10	97	59	9	123	17	106	0	0	0	0
Niger	Niamey	AGRHYMET	No													
Nigeria	Lagos	MRTI	Yes	4	7	3	4	8	6	25	2	23	0	0	0	0
Nigeria	Akure	FUTA	Yes	4	7	0	7	0	0	0	0	0	0	0	0	0
Peru	Lima	UNALM	Yes	1	4	0	4	0	0	0	0	0	0	0	0	0
Philippines	Quezon City	PAGASA	Yes	1	4	0	4	4	15	34	15	19	0	0	0	0
Philippines	Quezon City	UP	Yes	2	1	0	1	1	0	0	0	0	0	0	0	0
Qatar	Doha	QAC	Yes	7	6	1	5	4	4	23	4	19	0	0	0	0
Republic of Korea	Seoul	KMA	Yes	7	0	0	0	0	32	60	20	40	0	0	0	0
Russian Federation	Moscow	ATI	Yes	0	0	0	0	0	4	23	19	4	3	108	94	14
Russian Federation	Saint Petersburg	RSHU	Yes	22	330	160	170	84	5	9	6	3	9	102	42	60
Russian Federation	Moscow	MGMEH	Yes	3	24	19	5	2	0	0	0	0	0	0	0	0
South Africa	Pretoria	SAWS	Yes	6	7	2	5	4	8	54	11	43	4	50	20	30
Turkey	Ankara	TSMS	Yes	0	0	0	0	0	9	108	22	86	0	0	0	0
Uzbekistan	Tashkent	THMPC	Yes	6	1	1	0	2	0	0	0	0	0	0	0	0
Venezuela, Bolivarian Republic of	Caracas	UCV	No													
GRAND TOTAL			30	111	820	292	528	306	161	1,310	355	955	44	499	235	264

Table 3: Summary of all Trainees Trained by WMO RTCs in 2016

2016 RTC Courses		Local Participants			International Participants			TOTAL
Type	Nr.	TOTAL	Female	Male	TOTAL	Female	Male	
Long-term Courses	111	8,156	3,409	3,422	820	292	528	8,976
Short-term Courses	161	2,479	683	1,205	1,310	355	955	3,789
DL Courses	44	1,076	522	364	499	235	264	1,575
TOTAL	316	11,711	4,614	4,991	2,629	882	1,747	14,340

Figure 1: International Participation by Gender in 2016

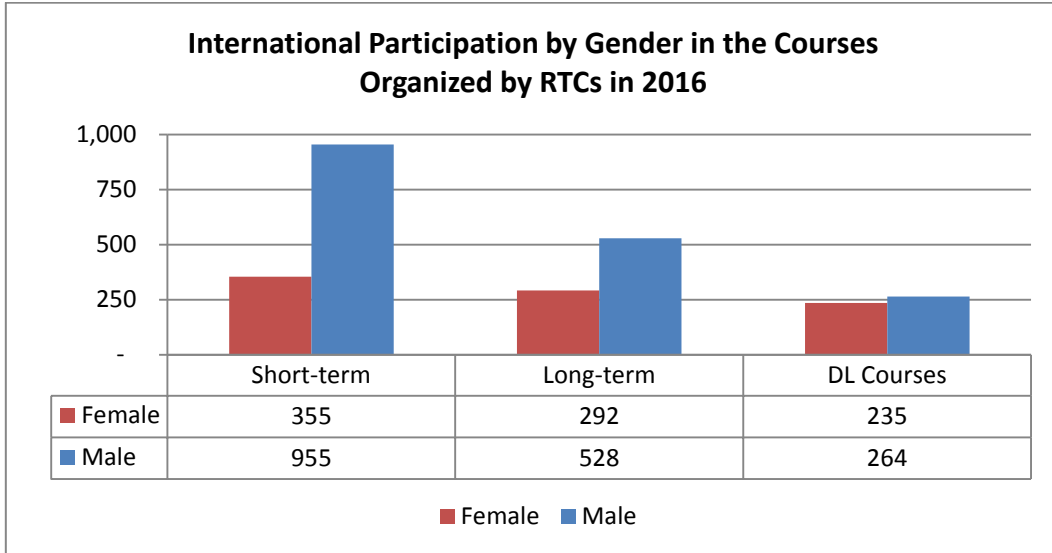


Figure 2: International Participation by Course Type in 2016

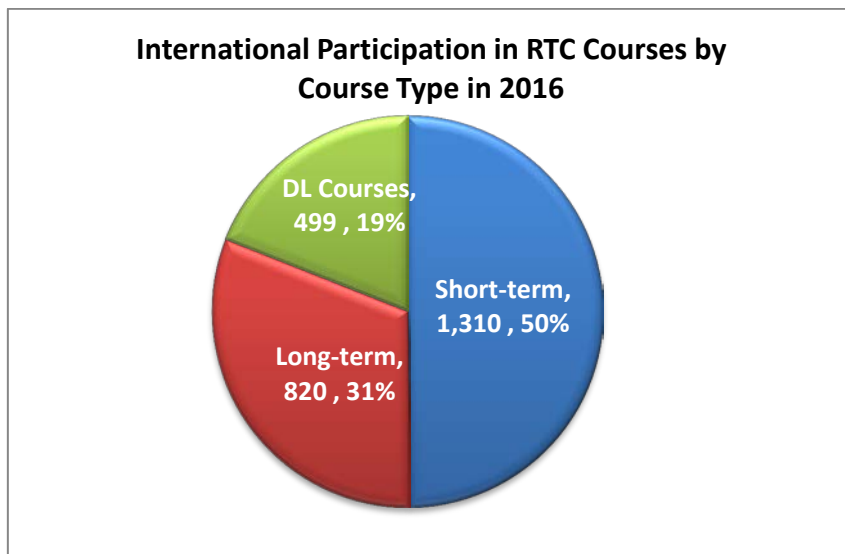


Table 3: International Trainees Trained by WMO RTCs in 2017

Country	City	RTC	2017 Report	Long-term Courses				Short-term Courses				DL Courses			
				Nr. of Courses	Int. Participants			Nr. of Courses	Int. Participants			Nr. of Courses	Int. Participants		
					TOTAL	Female	Male		TOTAL	Female	Male		TOTAL	Female	Male
Algeria	Oran	IHFR	Yes	4	60	14	46	2	0	0	0		0		
Angola	Luanda	INAMET	No		0				0				0		
Argentina	Buenos Aires	UBA	Yes	3	8	5	3	4	4	1	3	2	1	1	0
Argentina	Buenos Aires	SMN	Yes	0	0	0	0	1	0	0	0	7	87	61	26
Barbados	Bridgetown	CIMH	No		0				0				0		
Brazil	CVEM	UFPA	No		0				0				0		
China	Nanjing	NUJST	Yes	12	60	17	43	14	260	101	159	0	0	0	0
China	Beijing	CMATC	Yes	1	1	1	0	3	72	19	53	0	0	0	0
Costa Rica	San Jose	UCR	Yes	5	12	5	7	2	56	17	39	1	0	0	0
Egypt	Cairo	EMA	Yes	5	6	0	6	22	15	2	13	0	0	0	0
India	Pune	MTI	Yes	3	3	1	2	1	8	1	7	0	0	0	0
India	Pune	NWA	Yes	0	0	0	0	0	0	0	0	2	14	7	7
India	Roorkee	IITR	No		0				0				0		
Indonesia	Bandung	RCWR	No		0				0				0		
Indonesia	Jakarta	BMKG	Yes	3	0	0	0	13	100	22	78	3	0	0	0
Iran, Islamic Republic of	Tehran	IRIMO	Yes	4	0	0	0	8	7	2	5	2	0	0	0
Iraq	Baghdad	IMO	Yes	4	0	0	0	4	0	0	0	0	0	0	0
Israel	Bet Dagan	PTCAM	Yes	0	0	0	0	2	36	15	21		0		
Italy	Florence	IBIMET	Yes	0	0	0	0	1	25	6	19	1	29	6	23
Kenya	Nairobi	IMTR	Yes	5	19	3	16	17	168	14	154	1	42	9	33
Kenya	Nairobi	UONBI	Yes	10	19	9	10	0	0	0	0	10	1	0	1
Madagascar	Antananarivo	ESPA	Yes	5	9	2	7	0	0	0	0	0	0	0	0
Madagascar	Antananarivo	ENEAM	Yes	5	4	0	4	0	0	0	0	0	0	0	0
Niger	Niamey	EAMAC	No		0				0				0		
Niger	Niamey	AGRHYMET	No		0				0				0		
Nigeria	Lagos	MRTI	Yes	9	17	3	14	2	0	0	0	0	0	0	0
Nigeria	Akure	FUTA	Yes	4	10	3	7	0	0	0	0	0	0	0	0
Peru	Lima	UNALM	Yes	1	3	0	3	1	9	4	5	0	0	0	0
Philippines	Quezon City	PAGASA	Yes	2	2	0	2	11	0	0	0	0	0	0	0
Philippines	Quezon City	UP	Yes	2	0	0	0	0	0	0	0	0	0	0	0
Qatar	Doha	QAC	Yes	7	5	3	2	0	0	0	0	0	0	0	0
Republic of Korea	Seoul	KMA	Yes	10	0	0	0	79	65	26	39	64	0	0	0
Russian Federation	Moscow	ATI	Yes	0	0	0	0	36	32	27	5	18	297	243	54
Russian Federation	Saint Petersburg	RSHU	Yes	3	19	14	5	0	0	0	0	0	0	0	0
Russian Federation	Moscow	MGMTEH	Yes	27	562	287	275	11	17	0	17	6	82	37	45
South Africa	Pretoria	SAWS	Yes	6	1	0	1	14	136	34	102	5	76	15	61
Turkey	Ankara	TSMS	Yes	0	0	0	0	7	94	23	71	0	0	0	0
Uzbekistan	Tashkent	THMPC	No		0				0				0		
Venezuela, Bolivarian Republic of	Caracas	UCV	No		0				0				0		
GRAND TOTAL			30	140	820	367	453	255	1,104	314	790	122	629	379	250

Table 4: Summary of all Trainees Trained by WMO RTCs in 2017

2017 RTC Courses		Local Participants			International Participants			TOTAL
Type	Nr.	TOTAL	Female	Male	TOTAL	Female	Male	
Long-term Courses	140	7,469	3,943	3,526	820	367	453	8,289
Short-term Courses	255	4,221	2,064	2,157	1,104	314	790	5,325
DL Courses	122	4,933	2,247	2,686	629	379	250	5,562
TOTAL	517	16,623	8,254	8,369	2,553	1,060	1,493	19,176

Figure 3: International Participation by Gender in 2017

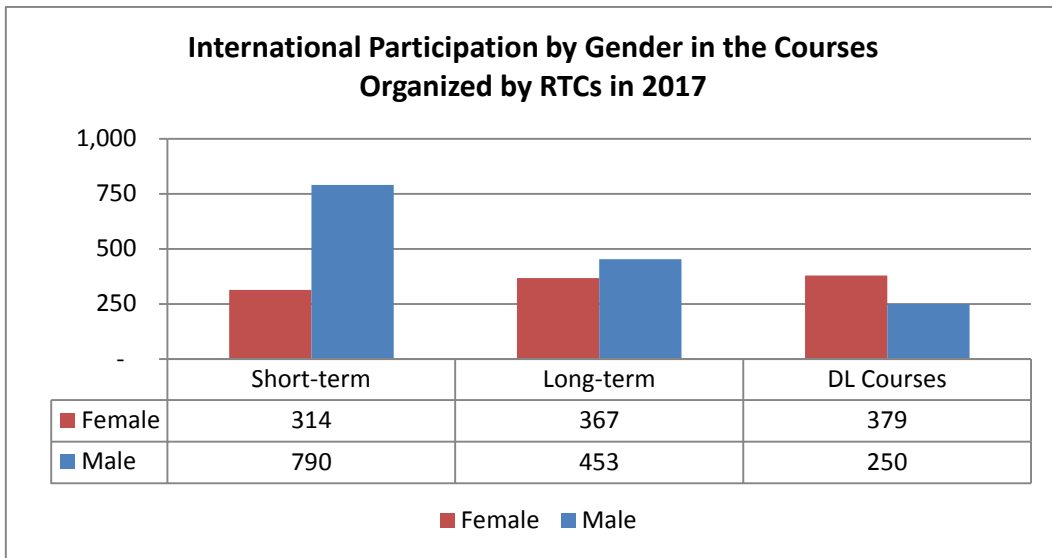
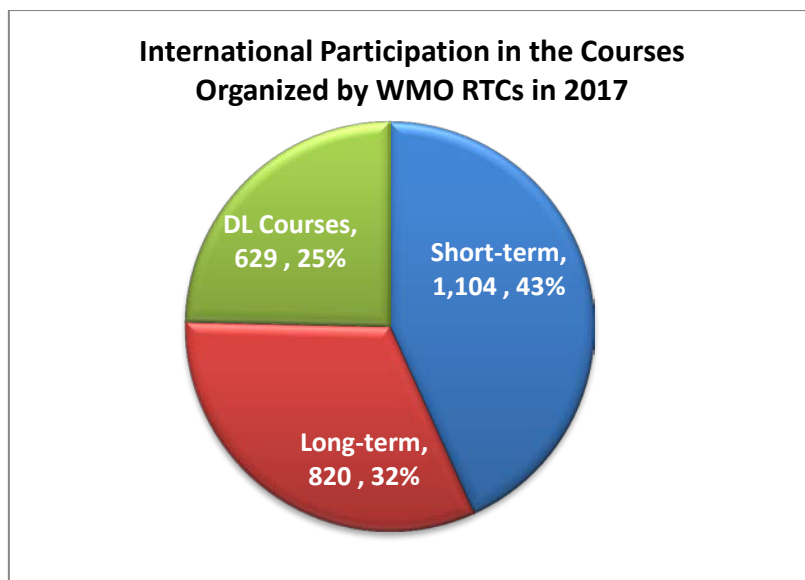


Figure 4: International Participation by Course Type in 2017



6.5 Designation and reconfirmation of WMO RTCs³

Recommendations 1-3 have been discussed via email by the Panel, and they were agreed to with consensus after revisions to the reports and further explanation. No final dissents were made.

3

Reference:

- [Spain External Review Report of AEMET.pdf](#)
- [Argentina External Review Report of FICH-UNL.pdf](#)
- [Peru External Review Report of SENAMHI.pdf](#)
- [Nigeria External Review Report of FUTA and MRTI.pdf](#)

Recommendation 4 is being asked of EC to avoid the expiration of RTC designations for those who were given restriction dates on their designation imposed by Resolution 52 (Cg-17).

Concerns have been raised by Panel members regarding follow up by RTCs on the recommendations made in External Assessment reports. This suggests that additional methods be considered for reporting on this follow up.

6.6 Review Programme for WMO RTCs

The external assessment program for 2018-2020 is expected to include the centers noted in the table below. It is necessary to get early agreement on who on the Panel will convene the External Assessment process, given an acceptable schedule. Note that some reviews intended for 2019 may occur in 2020 due to schedule and budget limitations.

See the table below.

Status of the External Review of WMO RTCs

RTC Host	Last Review	Years from Last Review	Expected Year for next Review	Next RA Session	Convenor
Egypt	(1) February 1999 (2) November 2008	10	2018	February 2019	Didier Reboux
Madagascar	(1) September 2005 (2) November 2009	9	2018	February 2019	Didier Reboux
Kenya	(1) January 2002 (2) October 2009	9	2018	February 2019	Winifred Jordaan
Philippines	(1) April 2002 (2) November 2010	8	2018	October 2018	
Qatar	Designated in 2010 Never Reviewed by Panel	8	2018		
Uzbekistan	(1) October 2002 (2) April 2011	7	2019		
Turkey	(1) April 2004 (2) December 2011	7	2019		
South Africa	Designated in 2011 Never Reviewed by Panel	7	2019	February 2019	
Russian Federation	(1) June 2004 (2) June 2011	7	2019		
Peru	Designated in 2011 Never Reviewed by Panel	7	2019	November 2018	
India	(1) December 2002 (2) March 2011	7	2019		
China	(1) October 2003 (2) April 2011	7	2019		
Indonesia	Designated in 2012 Never Reviewed by Panel	6		October 2018	
Italy	(1) November 2004 (2) November 2013	5			
Israel	(1) February 2007 (2) December 2013	5			
Niger	(1) February 2002 (2) November 2014	4		February 2019	
Korea	Designated in 2015 Never Reviewed by Panel	3			
Brazil	(1) September 2006 (2) February 2015	3		November 2018	
Nigeria	(1) November 2005 (2) June 2016 -	2	Ongoing	February 2019	

Iran	(1) October 2006 (2) August 2016	2			
Barbados	(1) April 2000 (2) March 2009 (3) May-December 2016	2			
Argentina	(1) March 2000 (2) May 2009 (3) November 2016	2		November 2018	
Costa Rica	(1) April 1999 (2) March 2008 (3) April 2017	1			
Algeria	(1) May 2005 (2) December 2017	1	Ongoing	February 2019	
Iraq	Designated in 1976 Never Reviewed by Panel	42	Review Postponed by EC-69		
Venezuela	(1) March 2005	13	To be decided	November 2018	
Angola	(1) July 2006	12	To be decided	February 2019	

Review Status by Region

Region	Country (Nr. of Components)	Last Review History	Intended EC Panel Review	Next RA Meeting	Following EC/Cg	Panel Member
RA-I	Angola	July 2006 ^(1st)	2018	October 2018	CG-18	
	Egypt	February 1999 ^(1st) November 2008 ^(2nd)	2018	October 2018	CG-18	Didier
	Kenya ⁽²⁾	January 2002 ^(1st) October 2009 ^(2nd)	2018	October 2018	CG-18	Winifred
	Madagascar ⁽²⁾	September 2005 ^(1st) November 2009 ^(2nd)	2018	October 2018	CG-18	Didier
	South Africa	NEW RTC	2019			
RA-II	China ⁽²⁾	October 2003 ^(1st) April 2011 ^(2nd)	2019			
	India ⁽⁴⁾	December 2002 ^(1st) March 2011 ^(2nd)	2019			
	Iraq	NEVER REVIEWED	Delayed			
	Qatar	NEW RTC	2018		CG-18	
	Uzbekistan	October 2002 ^(1st) April 2011 ^(2nd)	2019			
RA-III	Venezuela	March 2005 ^(1st)	Delayed			
RA-V	Philippines ⁽²⁾	April 2002 ^(1st) November 2010 ^(2nd)	2018		CG-18	
RA-VI	Russian Federation ⁽³⁾	June 2004 ^(1st) June 2011 ^(2nd)	2019			
	Turkey	April 2004 ^(1st) December 2011 ^(2nd)	2019			

6.6 Education and Training Office Publications and Discussions on How to Outsource Publications for Institutions

A list of current publications and reports prepared by ETR will be made available. Considering the need to support RTCs with resources, the Panel will be requested to advise on possible future publications and reports. The Panel will also be requested to guide on how to source for suitable publications for institutions in least developed and

developing countries. The Panel will also be requested to advise on other outreach events, such as collaboration with Globe and similar organizations.

Education and Training Publications and outreach materials

a) Recent publications and reports

S / N	Name of the publication	WMO No.	Language available	Latest version	comment
1	Guide to Competency	WMO-No. 1205	English	2018	
2	Why the world needs meteorologists	WMO-No. 1199	Arabic, Chinese, English, French, Spanish, Russian	2017	
3	Guide to the Management and Operation of WMO Regional Training Centres and Other Training Institutions	WMO-No. 1169	English	2017	
4	Status of Human Resources in National Meteorological and Hydrological Services	ETR-21	English	2017	Report of a survey
5	Why the world needs meteorologists and hydrologists	WMO No 1199	Arabic, English, French, Spanish, Russian	2017	Outreach for public and policy makers
4	A Career in Meteorology	WMO-No. 1126	English, French, Spanish, Russian	2017	Outreach on career development
5	Guidelines for Trainers in Meteorological, Hydrological and Climate Services	WMO-No. 1114	English, French, Spanish, Russian	2013	
6	Guidelines for Applying for a WMO Fellowship	WMO-No. 1104	English, French, Spanish, Russian	2013	Review in progress
7	Manual on Policies and Procedures for WMO Fellowships (This is being updated)	WMO/T D-No. 1356, ETR-18	Arabic, English, French, Spanish, Russian	2006	Review in progress
8	Competency Requirements for Education and Training Providers for Meteorological, Hydrological, and Climate Services	N/A	English, French, Spanish, Russian	2013	
9	Manual on the Implementation of Education and Training Standards in Meteorology and Hydrology	WMO-No. 1083	Arabic, Chinese, English, French, Spanish, Russian	2015	This document replaced WMO-NO.258 Volume-I on 1 Decembe

					r 2013
10	Aviation hazards	WMO/T D-No. 1390 - ETR-No. 20	English	2007	

b) Publications and reports in the pipeline

1	"A Compendium of Topics on Management Development for NMHSs" (A resource for training on management development)	TBD	English	2018	By Bob Riddaway (in progress)
2	An International Agenda for Education and Training in Meteorology and Hydrology	TBD	English	2018	Summary of key outcomes SYMET-XIII
3	Training Materials and Best Practices for Chemical Weather/Air Quality Forecasting (CW-AQF) Using 3-D Numerical Models (A resource for training on air quality forecasting)	TBD	English	2019	By Yang Zhang et al (in progress)