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| **World Meteorological Organization**  **REGIONAL ASSOCIATION III (SOUTH AMERICA)**  **Seventeenth Session** Santiago, Chile, 21 to 23 November 2018 | **RA III-17/INF. 3.5(1)** |
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## CAPACITY DEVELOPMENT

**Report on the WMO Regional Training Centres (RTCs) of RA III and Training Activities and Fellowships Delivered to the Region**

1. **WMO RTC in Argentina**

The RTC in Argentina is one of the very first RTCs recognized by EC-17 in 1965. The RTC had two components; the University of Buenos Aires (UBA), National Meteorological Service (SMN), and recently with Resolution-31 of EC-70, the Faculty of Engineering and Water Sciences (FICH) of the National University of the Litoral (UNL) was designated as the third component of the RTC in Argentina.

The RTC was externally reviewed by the EC Panel of Experts in March 2000, May 2009, and November 2016. The status of the RTC was reconfirmed by EC-52 in 2000, by EC-62 in 2010, and by EC-69 in 2017.

1. ***Servicio Meteorológico Nacional (SMN)***

The Center is specifically focused on operational meteorology and runs courses in online, face-to-face, and blended formats. It has its own Moodle platform installed to support online and blended courses. Topics range from: Modality / Geomagnetism and Solar Earth Relations, Solar Radiation Evaluation Workshop, Geomagnetism and Space Climatology, Operational Hydrological Balance for Agro, Observation Techniques in Geomagnetism, Processing and Interpretation of Satellite Images for Meteorology and Environment, Calibration of Meteorological Instruments, Surface Meteorological Observer, Training of Trainers, Training of Observation Practices Tutors, Surface Meteorological Observation Practices Course, METAR/SPECI, and Volcanic Ashes.

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| **SMN** | Long-term Courses | | | | Short-term Courses | | | | Distance Learning Courses | | | |
| Nr. of  Courses | International Participants | | | Nr. of  Courses | International Participants | | | Nr. of  Courses | International Participants | | |
| TOTAL | Female | Male | TOTAL | Female | Male | TOTAL | Female | Male |
| 2016 | 0 | 0 | 0 | 0 | 5 | 18 | 9 | 9 | 3 | 74 | 22 | 52 |
| 2017 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 7 | 87 | 61 | 26 |

The center is also good in cooperation and collaboration with WMO and hosted several WMO training activities for the region, e.g. WMO Training of Trainers Seminar for RA-III in 2016, and WMO RA-III Capacity Building Workshop on Impact-based forecast and Warning Services (IBFWS) and on the Common Alerting Protocol (CAP) in September 2018. Experts of the center have also been very active in development and translation of resources in Spanish language, and contributed the new cloud atlas.

1. ***Universidad de Buenos Aires (UBA)***

The Department of Atmospheric and Ocean Sciences of the University of Buenos Aires offers long-term and short-term courses in the form of face-to-face and online. The long-term courses are in “Licenciatura en Ciencias de la Atmósfera”, “Bachillerato en Ciencias de la Atmósfera”, and “Doctorado de la Universidad de Buenos Aires (area Ciencias de la Atmósfera y los Océanos)”. It also offeres short courses on Climate Models, Satellite oceanography, Marine Optic and Remote Sensing, and Characterization of Droughts and Their spatio-temporal Variability.

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| **UBA** | Long-term Courses | | | | Short-term Courses | | | | Distance Learning Courses | | | |
| Nr. of  Courses | International Participants | | | Nr. of  Courses | International Participants | | | Nr. of  Courses | International Participants | | |
| TOTAL | Female | Male | TOTAL | Female | Male | TOTAL | Female | Male |
| 2016 | 3 | 12 | 4 | 8 | 2 | 23 | 5 | 15 | 2 | 1 | 0 | 1 |
| 2017 | 3 | 8 | 5 | 3 | 4 | 4 | 1 | 3 | 2 | 1 | 1 | 0 |

1. ***Facultad de Ingeniería y Ciencias Hídricas (FICH)***

The FICH evolved in 1985 from the Department of General and Applied Hydrology, created in 1970 by the UNL, a University located in Santa Fe, capital of the Province of the same name in the Northeast of Argentina. The programmes offered by FICH of main interest to WMO are; at grade level: Water Resources Engineering (IRH), at post grade level: Master in Water Resources Engineering (MIRH) and Master in Integrated Water Resources Management (MGIRH). As the new component of the RTC, the FICH will start reporting next year with the report for 2018 activities.

1. **WMO RTC in Brazil**

The RTC in Brazil was recognized by Cg-7 in 1975, reconfirmed by EC-34 in 1982 and by EC-61 in 2009. The UFPA in Belem was the single until its withdrawal of designation as RTC by EC-65 in 2013. The new RTC is a network of a number of universities creating a virtual RTC, “Centro Virtual de Ensino e Treinamento em Meteorologia (CVEM)”, which was designated by EC-65 in 2015. The participant institutions collectively offer undergraduate courses, which are available at (<http://portal.mec.gov.br/index.php?Itemid=530>) and post-graduate courses at (<http://www.capes.gov.br/cooperacao-internacional/multinacional/pec-pg>) in several technical levels and for professional training in Portuguese. The CVEM has 13 universities and institutions in its network, INPE, UFAL, UFCG, UFPA, UFPel, UFRJ, UFSC, UFSM, UFRN, UEA, UNESP, UNIFEI, and USP. They train around 90 international students every year. Below is the table presenting the information obtained for 2016. No report is available for 2017.

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| **COURSE/**  **INSTITUTION** | **INPE** | **UFAL** | **UFCG** | **UFPA** | **UFPel** | **UFRJ** | **UFSC** | **UFSM** | **UFRN** | **UEA** | **UNESP** | **UNIFEI** | **USP** |
| **GRADUATION** | \* | 10 | 0 | 0 | 0 | = | 1 | 0 | 3 | 0 | 8 | 0 | 0 |
| **MASTER** | 5 | 5 | 1 | 9 | 4 | = | \* | 4 | 0 | 1 | \* | \* | 14 |
| **DOCTORATE** | 4 | 0 | 0 | 3 | 0 | = | \* | 0 | 0 | 5 | \* | \* | 10 |

***Total number of international students = 87***

1. **WMO RTC in Peru**

The RTC in Peru was designated by Cg-16 in 2011. The “Universidad Nacional Agraria La Molina (UNALM)” was the only component until designation of the “Servicio Nacional de Meteorología e Hidrología (SENAMHI)” as a component of the WMO RTC by EC-70 in 2018.

1. ***Universidad Nacional Agraria La Molina (UNALM)***

The National Agricultural University La Molina (UNALM) dates back to 1901, when the government of Peru planned and established the National School of Agriculture and Veterinary Authority (ENAV) based on studies of a Belgian Mission in July of that year. In 1960, the school was upgraded to the rank of a university and named “Universidad Nacional Agraria La Molina” (UNALM). Currently the UNALM is the only university in Peru that trains professionals in meteorology, with sound knowledge on physical sciences and mathematics. The UNALM has a strong collaboration with the National Meteorological and Hydrological Service of Peru (SENAMHI) which is also a well-organized institution that was established since 1969 and became an RTC component in 2018.

Training in meteorology was introduced in 1973 under the Faculty of Science which is composed of the Department of Environmental Engineering, Physics and Meteorology; Departments of Mathematics, Biology and Chemistry. In 1996, admission was suspended due to administrative reasons until 2007 when a resolution was approved for UNALM to recommence admitting students for studies in meteorology. UNALM is funded by the Government of Peru and students’ registration fees.

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| **UNALM** | Long-term Courses | | | | Short-term Courses | | | | Distance Learning Courses | | | |
| Nr. of  Courses | International Participants | | | Nr. of  Courses | International Participants | | | Nr. of  Courses | International Participants | | |
| TOTAL | Female | Male | TOTAL | Female | Male | TOTAL | Female | Male |
| 2016 | 1 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2017 | 1 | 3 | 0 | 3 | 1 | 9 | 4 | 5 | 0 | 0 | 0 | 0 |

1. ***Servicio Nacional de Meteorología e Hidrología (SENAMHI)***

The National Meteorological and Hydrological Service of Peru (SENAMHI) is a well-organized institution that was established in 1969, and provides public services, consulting, studies and scientific research in the areas of Meteorology, Hydrology, Agrometeorology and Environmental Affairs. The SENAMHI has, in its central office in Lima, facilities for communication, computing, forecasting, numerical weather prediction, satellite imagery, climate prediction and research. These facilities are also used for practical training sessions and on-the-job training. It has extensive partnership locally and internationally and is currently implementing several donor funded projects. The SENAMHI hosted several training activities related to these projects like CLIMANDES, and trained many staff of the NMHSs from the Andean Region. They also hosted the WMO Human Resources Development Workshop in 2010. The SENAMHI has installed a distance learning platform in Moodle, which supports its online and blended learning activities. As the new component of the RTC, the SENAMHI will start reporting next year with the report for 2018.

1. **WMO RTC in Venezuela**

The “Universidad Central de Venezuela (UCV)” in Caracas was designated by EC-27 in 1975, which provides BSc in Meteorology and Hydrology, Postgraduate Courses in Hydrology, and other specialized courses are offered online. The RTC was externally reviewed in March 2005 and reconfirmed as RTC by EC-58 in 2006. There was no review for the past 12 years, as the PR of Venezuela requested postponement of the review. The RTC has not submitted any annual report for the past four years.

1. **Short-term Training Support Provided by WMO ETRP**

In addition to the supports given by the Technical Departments (TDs) of WMO, the Education and Training Programme organized a number of training events and provided support to participants from RA-III to attend. Also a number of participants were co-sponsored in the events organized by the RTCs and the education and training partners. The below two tables indicate the Member, training event, and number of participants supported. The number with “\*” indicates the online training events.

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| ***Member*** *Institute, Training Event Title* | ***2016*** |
| **Argentina** | **22** |
| Hong Kong China-HKO, Use and Interpretation of Mesoscale Numerical Weather Prediction | 1 |
| WMO-ETR, Online Course for Trainers of RA III and RA IV\* | 21 |
| **Brazil** | **3** |
| WMO-ETR, Online Course for Trainers of RA III and RA IV\* | 2 |
| WMO-ETR, Training Development Workshop for Regional Training Institutions in RAs III and IV | 1 |
| **Chile** | **5** |
| WMO-ETR, Online Course for Trainers of RA III and RA IV\* | 4 |
| WMO-ETR, Training Development Workshop for Regional Training Institutions in RAs III and IV | 1 |
| **Colombia** | **2** |
| WMO-ETR, Online Course for Trainers of RA III and RA IV\* | 1 |
| WMO-ETR, Training Development Workshop for Regional Training Institutions in RAs III and IV | 1 |
| **Ecuador** | **2** |
| WMO-ETR, Online Course for Trainers of RA III and RA IV\* | 2 |
| **El Salvador** | **1** |
| WMO-ETR, Training Development Workshop for Regional Training Institutions in RAs III and IV | 1 |
| **Peru** | **8** |
| WMO-ETR, Online Course for Trainers of RA III and RA IV\* | 5 |
| WMO-ETR, Training Development Workshop for Regional Training Institutions in RAs III and IV | 3 |
| **Uruguay** | **2** |
| WMO-ETR, Online Course for Trainers of RA III and RA IV\* | 2 |
| **Total** | **45** |

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| ***Member*** *Institute, Training Event Title* | ***2017*** |
| **Argentina** | **2** |
| WMO-ETR, Symposium on Education and Training and Meeting for RTC Directors | 2 |
| **Brazil** | **1** |
| WMO-ETR, Symposium on Education and Training and Meeting for RTC Directors | 1 |
| **Ecuador** | **1** |
| WMO-ETR, Symposium on Education and Training and Meeting for RTC Directors | 1 |
| **Peru** | **1** |
| WMO-ETR, Symposium on Education and Training and Meeting for RTC Directors | 1 |
| **Venezuela, Bolivarian Republic of** | **1** |
| China-NUIST, International Training Course on "Numerical Weather Predication" | 1 |
| **Total** | **6** |

1. **WMO Fellowships Provided to RA-III (2014-2017)**

In the past four years from 2014 to 2017, there were 83 fellowship requests from RAIII for short and long term study ranging from one month service delivery course to five years degree study, 54 were awarded. The annual average of awarded against request is 14 and 21 with the award rate of 64%, 14% higher than the global average award rate of 47%.

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|  | **Request by region** | **Total awarded by Region** | **Total awarded/request in each region%** | **Female request by region** | **Female request in region%** | **Total female awarded by Region** | **Female awarded by female request in each region %** |
| 2014 | 11 | 6 | 55% | 3 | 27% | 1 | 33% |
| 2015 | 20 | 14 | 70% | 7 | 35% | 5 | 71% |
| 2016 | 26 | 19 | 73% | 4 | 15% | 2 | 50% |
| 2017 | 26 | 15 | 58% | 6 | 23% | 5 | 83% |
| annual Average | 21 | 14 | 64% | 5 | 25% | 3 | 60% |
| total | 83 | 54 |  | 20 |  | 13 |  |

There were 13 female awards against 20 requests in the past four years. Female annual average requests is only 5 with awarded of 3, which is lower than overall requested and awarded of 24 and 14.

The overall awarded rate in the past four years was 64% in RAIII. Though female requests rate was low in the Region with four year’s average of 25% against the overall requests, the awarded rate is also lower of 60%. Though in fellowship programme to reflect WMO’s gender main stream policy, much weight is put on awarding female candidates, but low female request rate is key in low female award rate in Region III. Therefore the NMSs are urged to raise the opportunities for female candidates in the requests for fellowship and capacity building.

1. **Summary of the Outcomes of the Meeting of Heads of Regional Training Centres (RTC) Barbados, 2 November 2017**

The meeting reflected on a number of issues and came up with the following recommendations/observations:

The Management Development Training resource material being developed by the WMO ETR Office be published as a WMO Information Note in the first quarter of 2018 and shared with RTCs and other training institutions;

When a review of the BIP-M and BIP-MT is undertaken, consider including learning outcomes related to management development;

RTCs to consider running management development courses;

The RTCs create a list and regularly update it of national/regional institutional specialities in all WMO priority areas. This list to contain contact addresses and advise whether the institutions are willing to share resources;

Strongly recommended that RTCs and other training institutions share resources and strive to develop relationships to advance training and capacity development in their respective regions and beyond where possible;

Concluded that RTCs must take into account the rapid changes in technology and user-orientated services whilst developing and revising their education and training programmes;

Strongly recommended that operationalization of the WMO Global Campus is fast tracked and that WMO consider seeking regional consultation in the development;

RTCs must align their programmes to support the WMO competency and qualification frameworks and provide participant documentation that could be used in their home services to show what sections of the various competency frameworks had been addressed in the training intervention;

RTCs actively participate in raising resources for fellowships and other education and training activities;

Noted that due to low bandwidth it could be difficult to use complex web and other online interfaces and thus the meeting recommended that participants use their influence to request software interfaces that included an option suitable for low bandwidth connections;

Encouraged RTCs to follow the rapid evolution in technology and changes in services wherever possible and where this was not possible to strategize on how to overcome capacity issues;

Encouraged the RTCs to collect research results of institutions cooperating with the RTCs and make them available to their students and other RTCs where appropriate. The meeting requested RTCs to encourage research institutions to develop new services and products;

Encouraged RTCs to share their documents/information with the ETR Office who will consider them for global circulation.