Training Program on Climate Change Adaptation and Disaster Risk Reduction in Agriculture
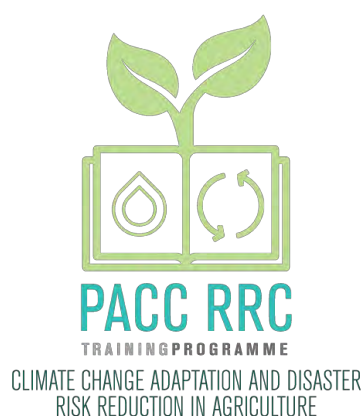
PACC RRC
TRAININGPROGRAMME
CLIMATE CHANGE ADAPTATION AND DISASTER
RISK REDUCTION IN AGRICULTURE

Final Report

10 April 2017 – 31 December 2020

Partnership	WMO (World Meteorological Organization), IBE-CNR (Italy), AGRHYMET Regional Centre (CILSS/ECOWAS),
General objective	To reduce the impacts of Natural Disaster and Climate Change on agricultural sector in West Africa.
Specific objective	To improve the capacity of West African governments through their national technical services to support government actions in sustainable development and food security, in response to climate change, natural disasters and their associated risks.
Project's duration	44 months
Target Countries	Western Africa CILSS/ECOWAS states Members
Target groups	Experts of National Agriculture, Agro-Meteorological, Hydrological and Early Warning Services.
Project's typology	Capacity Building (Art. 18)
Budget	€ 822,843.27
UN Millennium Goals	Goal 1 : Eradicate extreme poverty and hunger Goal 7 : Ensure environmental sustainability

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1. Background

The PACC-RRC project was led by the World Meteorological Organization (WMO) in collaboration with two WMO Regional Training Centers, the Institute of BioEconomy (formerly Biometeorology) of the Italian National Research Council (IBE-CNR) and the AGRHYMET Regional Centre (CRA), which operated with technical and financial support of WMO.

The World Meteorological Organization, IBE–CNR and AGRHYMET Regional Centre have been collaborating since the '70s to support National HydroMeteorological Services in the transfer of technological innovations.

In 2015, WMO, IBE-CNR and AGRHYMET decided to propose a Regional Training Programme to support CILSS/ECOWAS (Comité Inter-état pour la Lutte contre la Sècheresse au Sahel/Economic Community of West Africa States) countries on Climate Change Adaptation and Disaster Risk Reduction in Agriculture.

On 23 October 2015, WMO proposed to the Italian Ministry of Foreign Affairs and International Cooperation (MAECI), Directorate General for Development Co-operation (DGCS), to fund a multi-lateral aid proposal addressing Climate Change Adaptation and Disaster Risk Reduction in Agriculture in West Africa (PACC-RRC).

On November 19th 2015, with the resolution n.165 the Italian Ministry of Foreign Affairs and International Cooperation, Directorate General for Development Co-operation, decided to make a contribution of 822.843,27 to support the Initiative [AID 010717].

On December 24th 2015, the Third-party cost-sharing agreement between the WMO and the MAECI-DGCS for the implementation of the project was signed.

After receiving the funds transfer in early 2017, WMO organized the kick-off meeting of the project on 10-12 April 2017 in Geneva at its headquarters.

The inaugural ceremony took place on Monday 10 April with the presence of the WMO Secretary-General, Prof. Petteri Taalas and his Excellency Ambassador Maurizio Serra, Permanent Representative of Italy to the UN. The two WMO Regional Training Centers partners for the project were represented by the Director of IBE-CNR, Dr Antonio Raschi and Dr Moussa Waongo from AGRHYMET.

On January 22 2019, the Secretary-General of WMO addressed a request to the Permanent Mission of Italy to the United Nations for a project no-cost extension (Note Verbale 35269/2018), further supported by a second communication on March the 6th 2019 (Note Verbale 5234/2019).

Since the 1st of June 2019 IBE changed its name in Institute for the BioEconomy (IBE).

On April the 1st 2020, DGCS approved the no-cost extension of the project (Ref. 01/04/2020 – 0004208).

This final report covers the period from 10 April 2017 to 31 December 2020 and covers all technical and management activities related to the PACC-RRC project.

2. The project

2.1 Objectives

General Objective   To reduce the impacts of Natural Disaster and Climate Change on agricultural

	sector in West Africa.
Specific Objective	To improve the capacity of West African governments through their national technical services to support government actions in sustainable development and food security, in response to climate change, natural disasters and their associated risks

These objectives will be obtained through two expected results:

Expected result 1	Technical and scientific knowledge on Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR) of the technical services' staff of the CILSS/ECOWAS Countries is enhanced.
Expected result 2	The Regional network that brings together the community of technical services involved in CCA and DRR is strengthened thanks to better collaboration and improved technical and scientific cooperation among National Hydro-Meteorological Services, other technical services and regional and international institutions.

2.2 Partnership

The World Meteorological Organization led the project. Partners of the project were two WMO Regional Training Centers, the Institute for BioEconomy (formerly Institute of Biometeorology-IBIMET) of the Italian National Research Council and the AGRHYMET Regional Centre, which operate with technical and financial support of WMO.

WMO was responsible for the planning and the organization of activities, coordination of different actors, and financial and technical reporting to the donor. As project manager, WMO coordinated and assisted the other actors in the project outreach and communication activities. WMO ensured direct communication and coordination with the Italian Permanent Mission in Geneva, through which all official communication and reporting are transmitted. The WMO participated in the technical activities by providing guidelines for the training methodology and its content experts were involved in the training activities and planned events.

IBE-CNR ensured the technical coordination of the activities. In agreement with the other actors, IBE took part in the definition of the training methodology, realized three training courses in Italy (the latter transformed in distance learning in response to COVID-19), and participated in all courses organized by AGRHYMET. IBE also organized the Networking Conference in Italy. IBE co-sponsored the initiative by providing its own permanent personnel and infrastructure. IBE ensured technical coordination with the Ministry of Foreign Affairs and International Cooperation (MAECI) and AICS (Italian Agency for Development Cooperation) in Rome for the Networking Conference.

The AGRHYMET Regional Centre participated in the definition of the training methodology and supported other actors in communication at the regional level. Moreover, it organized two training courses and supported the networking and mentoring activities in the sub-region through its national focal points. Experts of AGRHYMET participated in the training courses organized by IBE and in the Conference. AGRHYMET co-sponsored the initiative by providing its own permanent personnel and infrastructure. AGRHYMET ensured direct communication with CILSS/ECOWAS and other regional stakeholders.

The project partners developed collaboration with other technical and scientific partners in the region as well with international initiatives (i.a. ANADIA) and projects dealing with climate change adaptation and disaster risk reduction. Third parties were involved in training activities as required to meet specific training objectives. For that purpose synergies have be established with technical and scientific institutions active in the region such as CMCC (Italy), ECMWF (UK), IRD (France), CNRS (France), CIRAD (France), Slovenian

Environment Agency (Slovenia), GET (France), CIMA RESEARCH FOUNDATION (Italy), LaMMA (Italy), University of Florence (Italy), Polytechnic of Turin (Italy), University of Turin (Italy), Sorbonne Universités (France), University of Tiaret (Algeria), University of Leeds (UK), Université de Strasbourg (France), University of Lagos (Nigeria), Université Pierre et Marie Curie (France), Columbia University (USA).

PACC-RRC also shared products of the project with other institutions in the form of training resources and strategies developed. These contributions and collaborations are to be considered as important components of the project impacts.

2.3 Beneficiaries

The intervention scope of the project are the 17 member states of CILSS/ECOWAS (Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo, Mauritania and Chad), which encompass most of West Africa.

The initiative was designed to build the capacities of experts and technicians of National Meteorological and Hydrological Services, other national technical services, specialized agencies and other public or private institutions operating in the target service areas of Climate Change Adaptation and Disaster Risk Reduction. The recipients improved their skills through training courses and enhanced their networking capacity through the project follow-up and post-course activities.

Ministries and Institutions to which participants belong also benefit from the creation of a partnership network with relevant structures at regional and international levels. This will allow both better management of institutional activities, institutional training strategies and greater ability to establish partnerships to develop future project proposals. Finally, the ultimate beneficiaries will be people and groups involved in different types of agricultural production, which will benefit from better support from the Government and its technical services.

2.4 Methodological approach

The strategic approach of the project was to consolidate and innovate the existing sub-regional networks among national, regional and international institutions. The strategy of PACC-RRCwas based on two main axes:

1. The organization of training courses for technicians and experts of National Services to develop effective climate services for Climate Change Adaptation and Disaster Risk Reduction. The main objective of the courses was to enhance the participants' abilities to plan and adopt strategies to mitigate climate and weather impacts, harmonize methods of analysis, and strengthen cooperation in these efforts at a regional level.

2. Improving the network between scientific and technical institutions to work on shared methodologies and to create and share mechanism of knowledge management. The aim was to transfer and share expertise and knowledge, to expand cooperation in sensitive areas at national and regional levels and to promote exchanges and collaboration. Tools used for this purpose have been an open access platform for knowledge and training resources management (TOPaCS- Training Operational Package for Climate Services), Information and Communication solutions for networking and distance support and, finally, a networking event.

2.4.1 Training approach

Knowledge enhancement occured through training courses that included activities that expand theoretical knowledge and practical exercises that allow the direct application of theoretical concepts through the analysis of case studies (in a 50-50 ratio). The active participation of the trainees in collaborative exercises was fundamental for the realization of an interregional partnership among technicians and scientists.

A blended solution of distance learning and classroom workshops was adopted for all the courses.

Distance learning was used for:

- pre-workshop activities in order to ensure a common background knowledge among participants and basic skill in the manipulation of tools and software that will be used in the workshops.
- preliminary assessment of the specific skills of the students and preliminary distance training activities;
- sharing with students of various courses, teaching aids and technical and scientific documentation on the topics and practical exercises covered during the workshop;
- assessment of students and workshops through the online questionnaires;
- sharing of multimedia material produced for the course;
- monitoring and evaluating trainees after the workshop;
- deliver training courses when face-to-face training was not possible (during the COVID-19 outbreak).

Classroom workshops were used for more in-depth theoretical content and practical exercises.

Trainings in Italy have been conducted in English. Tutoring in French has been guaranteed for practical sessions. Trainings in Niger have been conducted in French, with tutoring available in English. Training material was available in both languages as far as possible.

Trainers have been provided with guidelines for developing their training materials, and layout of presentations. Trainers have been asked to provide well in advance before the workshop the training resources including presentation with summary and annotations to be translated as fully as possible to allow bilingual participation. Training resources have been made available with open access after the core training events, as well as shared via the TOPaCS platform and WMO Global Campus for other users.

Follow-on activities have been also proposed, interlinked with the networking component. All participants have been asked to share the knowledge gained within their home institutions, and this sharing via local courses or mentoring have been reported to the project team and other participants.

Ongoing mentoring and support are considered critical party of the training approach to ensure the long-term impacts and sustainability of the project. The main tool developed by the project partners is the TOPaCS platform for distance learning and connecting participants to appropriate knowledge, an interdisciplinary community of practice and accessing a repository for knowledge management linked to WMO Global Campus.

2.4.2 Trainees selection

The sustainability of the training program was based on the selection of trainees, on their active participation and application of suitable technologies and, finally, on a technical exchange among national and international institutions.

The training sessions were designed for actors with different levels of experience and disciplines. For this reason, the planning of the courses required a careful process of information and selection of participants to identify the topics in order to enhance their capability and skills as required by their institutions.

Activities have been announced by WMO to Permanent Representatives (PRs) of Member countries and by

AGRHYMET to target countries' CILSS representatives. Because one of the goals of the project was to engage all institution partners, PRs have been asked for up to three nominations, of which no more than two from the national meteorological and hydrological service. Participants' selection has been made by the three project partners, with the goal to broaden national and institutional engagement. PRs have been sensitized for ensuring gender diversity, nevertheless participation of females into the courses has been very low.

At least 17 participants per each course (except for the last one for which the nominations were 12) have been selected among nominations from PRs of member countries. The selection was based on geographical representativeness (in principle, 1 participant from each country), as well as the suitability of the participant based on the CV and nomination form. In the case that one or more countries did not propose participants, additional places have been allocated to the other target countries. An internal committee of the organizing partners conducted preliminary selection. Once this ranking was established, it has been shared for advice with WMO and the third partner.

Other participants, up to 5 further, have been accepted to participate to courses with funding from other sources outside the project (except for the last one when the external participants have been 7).

3. Synthetic description of activities

The Training Program started 10 April 2017 with the kick-off meeting. The activities have been realized as follows in the Gantt chart.

Table 1, Gantt Chart

Activity / Month	2017										2018												2019												2020										
	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
0.1 Project management and Kick-off meeting	X/I							T		T			A			T					T	A		T						T															F
Expected result 1																																													
1.1 Training Course on Climate services for disaster prevention (extreme events) - Italy								X	X																																				
1.2 Training Course on Agrometeorological Services for agriculture and water use (irrigation and horticulture) -Niger											X	X																																	
1.3 Training Course on Methodologies for Climate Change impact assessment - Italy															X	X																													
1.4 Training Course on Agrometeorological Services for rainfed crops - Niger																			X	X																									
1.5 Training Course on Climate and Risks Communication																																												X	X
Expected result 2																																													
2.1 Networking Conference – Italy																							X																						
2.2 Mentoring and support																																													
2.3 TOPACS eLearning package																																X	X												

Events = X

Reports= I (Inception), A (Annual), F (Final), T (Training)

The activities carried out during the project refer to the following expected results:

1. Technical and scientific knowledge on Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR) of the technical services' staff of the CILSS/ECOWAS Countries is enhanced. Particularly, five training courses have been delivered.
2. The Regional network that brings together the community of technical services involved in CCA and DRR is strengthened thanks to better collaboration and improved technical and scientific cooperation among National HydroMeteorological Services, other technical services and regional and international institutions.

The following table synthetize the activities and the results.

Table 2, List of activities and results

	Activity	Start	End	Results
0.1	Project management and Kick-off meeting	10/04/2017	11/04/2017	Kick-off meeting (10-11/04/2017), project meetings
0.2	Project reports	10/04/2017	31/12/2020	Inception Report First Quarterly Report Second Quarterly Report Annual Report Fourth Quarterly Report Fifth Quarterly Report Annual Report Sixth Quarterly Report Seventh Quarterly Report Final Report
0.3	Identify connections with relevant region projects	10/04/2017	31/12/2018	Collaboration with ANADIA2 project in Niger
0.4	LOAs in place	10/04/2017	31/12/2020	LoA IBE-WMO and amendments LoA AGRHYMET-WMO and amendments
1	**Expected result 1**			
1.1	*Training Course on Climate services for disaster prevention (extreme events) – Italy*			
1.1.1	Preparation	10/04/2017	20/11/2017	Information note and application form, Announcement (91 candidatures received), Final Programme, Selected 25 participants from 17 countries + 3 additional participants from Niger supported by ANADIA2, Course materials uploaded on the IBE moodle platform, administrative procedures for acquiring goods and services
1.1.2	Distance Learning	23/10/2017	10/11/2017	On the IBE Moodle platform
1.1.3	Event	20/11/2017	01/12/2017	Training Course on Climate Services for Disasters Prevention done in Florence at IBE-CNR, 28 participants and 20 trainers
1.2	*Training Course on Climate services for irrigation – Niger*			
1.2.1	Preparation	10/09/2017	19/02/2018	Information note and application form, Announcement (70 candidatures received), Final Programme, Selected 25 participants from 14 countries, Course materials uploaded on the ETR moodle platform, administrative procedures for acquiring goods and services
1.2.2	Distance Learning	01/02/2018	14/02/2018	On the ETR Moodle platform
1.2.3	Event	19/02/2018	02/03/2018	Training Course on Agrometeorological Services for Irrigation done in Niamey at AGRHYMET,

				25 participants and 3 trainers
1.3	*Training Course on Climate Change Impacts: Assessment and Communication*			
1.3.1	Preparation	02/01/2018	25/06/2018	Information note and application form, Announcement (34 candidatures received), Final Programme, selected 25 participants from 16 countries + 2 additional participants self-funding, Course materials uploaded on the IBE moodle platform, administrative procedures for acquiring goods and services
1.3.2	Distance Learning	28/05/2018	22/06/2018	On IBE Moodle platform
	Event	25/06/2018	06/07/2018	Training Course on Climate Change Impacts: Assessment and Communication done in Florence at IBE-CNR, 27 participants and 24 trainers
1.4	*Training Course on Climate Services for rainfed crops*			
1.4.1	Preparation	11/04/2018	29/10/2018	Information note and application form, Announcement (34 candidatures received), Final Programme, selected 25 participants from 16 countries + 1 additional participant self-funding, Course materials uploaded on the CRA moodle platform, administrative procedures for acquiring goods and services
1.4.2	Distance learning	01/10/2018	12/10/2018	Done on CRA Moodle Platform
1.4.3	Event	29/10/2018	09/11/2018	Training Course on Climate Services for rainfed crops done in Niamey, 26 participants and 8 trainers
1.5	*Training Course on Climate and Risks Communication*			
1.5.1	Preparation	01/10/2019	30/09/2020	Information note and application form, Announcement (19 candidatures received), Final Programme, selected 12 participants from 11 countries + 7 additional participant funded by other projects, Course materials uploaded on the IBE moodle platform, administrative procedures for acquiring goods and services for the event, cancellation of the event because of COVID-19, Preparation of a synchronous distance learning, administrative procedures for acquiring goods and services for the distance learning
1.5.2	Asynchronous Distance learning	24/02/2020	20/03/2020	Done on the TOPACS asynchronous module
1.5.3	Synchronous Distance Learning	01/10/2020	05/11/2020	Done on the IBE Moodle platform, 21 participants and 16 trainers
2	**Expected result 2**			
2.1	*Networking Conference – Italy*			
2.1.1	Preparation	01/09/2018	02/02/2019	Information note, announcement, admission of participants, travels and accommodation setting, logistics for the conference hall, administrative procedures for acquiring goods and services for the event, preparation of a web site.
2.1.2	Event	04/02/2019	05/02/2019	Done in Rome at CNR central premises, 76 participants from 21 countries, including representatives of 3 embassies and 6 international organizations
2.2	*Mentoring and support*			
2.2.1	Communication	01/09/2017	31/12/2020	PACC-RRC logo and image, PACC-RRC web page on climateservices.it, PACC-RRC page on the WMO web

				site, PACC-RRC on Facebook, Instagram and Twitter, brochures in English and in French
				Defined procedures for monitoring and evaluating follow-on activities
2.2.2	Follow-on	01/12/2017	03/02/2019	Follow-on activities for 4 courses. Selection of the 4 best performing students to be invited at the final conference in Rome
2.3	*TOPACS*			
2.3.1	Design	05/02/2019	30/04/2019	Definition of the overall strategy and architecture of the TOPacC, discussion and verification with WMO
2.3.2	Setup and customization of the moodle platform	01/03/2019	15/05/2019	A New deployment of moodle was set up for TOPACS
2.3.3	Contents production and publication	05/04/2019	31/10/2019	11 courses online
2.3.4	Validation and presentation	28/10/2019	05/12/2019	Presentation and validation of TOPACS in 2 meetings in Cairo and in Florence

4. Training courses

4.1 Training Course on Climate Services for Disaster Prevention

4.1.1 Preparation of the training course

The preparation of the first training course started just after the kick-off meeting. The announcement was sent by WMO to PRs of beneficiary countries in early June 2017 and the deadline for application was 15 July and then extended to 31 of July to allow all the countries to respond. The response from National HydroMeteorological Services was impressive, 91 candidatures were received from around the world.

Table 3, List of candidatures of the first training course

	CILSS/ECOWAS Countries	Nr of applications		Other Countries	Nr of applications
1	Benin	3	1	Argentina	1
2	Burkina Faso	2	2	Belize	1
3	Cabo Verde	1	3	Comoros	3
4	Chad	1	4	Croatia	1
5	Cote d'Ivoire	3	5	Ecuador	1
6	Ghana	4	6	Georgia	1
7	Guinea	3	7	Honduras	3
8	Guinea-Bissau	1	8	Kazakhstan	1
9	Liberia	3	9	Kenya	3
10	Mali	2	10	Macedonia	2
11	Mauritania	2	11	Malawi	2
12	Niger	3	12	Morocco	2
13	Nigeria	4	13	Myanmar	3
14	Senegal	1	14	Netherland	1
15	Sierra Leone	2	15	Papua New Guinea	1
16	The Gambia	3	16	Philippines	1

17 Togo		1	17 Seychelles	1
Total 1		**39**	18 Solomon Islands	2
			19 South African	3
			20 South Sudan	2
			21 Sudan	5
			22 Suriname	1
			23 Tajikistan	2
			24 Tonga	1
			25 Trinidad and Tobago	2
			26 Tunisia	1
			27 Ukraine	3
			28 Venezuela	2
			29 Congo	1
			Total 2	**52**
TOTAL 91				

25 participants were selected from the target region, according to the following criteria adopted:

- Education Level: to be specialized in meteorology, climatology, hydrology, agricultural sciences, or water management.
- Position/Task: from National Hydro-Meteorological Services, National Agricultural Services, National Platforms for Disaster Risk reduction or Research Institutions from CILSS/ECOWAS Countries
- Basic knowledge of geostatistical analysis (basic knowledge of R and/or QGis is desirable)
- Experience: At least 3 years of relevant working experience Climatic risk analysis
- Language: To be proficient in English

Three further participants not requesting financial assistance were also accepted. The list of participants is reported in Table 4.

Table 4, List of participants

First Name	Last Name	Organization
Aurelien Ahonakpon Yassemoan	Tossa	SMN - Benin
Guillaume	Nakoulma	DMN - Burkina Faso
Djergo	Gaya	DREM - Chad
Yeffe Benjamin Aristide	Aguia	SODEXAM Côte d'Ivoire
Bomo Veronique	Manouan	SODEXAM Côte d'Ivoire
Obed Amankwah	Minkah	GMET - Ghana
Patrick Nii Lante	Lamptey	GMET - Ghana
Maoro	Beavogui	DMN - Guinea
Eugene V.S.	Gar-Glahn	LMS - Liberia
Henry Adama	Simpson	LMS - Liberia
Aissata	Sao	ANM - Mali
Koumare	Ismahila	ANM - Mali
Hamidou	Coulibaly	ONM - Mauritania
Sid Elemine	Saleck	ONM - Mauritania
Nazirou	Toune	DMN - Niger

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Joyce Waha	Ogunleye-Machoko	NMA - Nigeria
Ahmad Aboki	Usman	NMA - Nigeria
Fatou	Sima	DWR - The Gambia
Peter	Gibba	DWR - The Gambia
Latifou	Issaou	DMN - Togo
Orlando	Mendes	INM - Guinea Bissau
Papa Ngor	Ndiaye	ANACIM - Senegal
Aissatou	Sitta	DMN - Niger
Aissa	Boubacar A. Diallo	DMN - Niger
Lawan Gaptia	Katiellou	DMN - Niger

Following selection, administrative procedures for acquiring goods and services were launched, for the travels, participants' accommodation, local transportation, coffee breaks and lunches. Trainees were supported in the process to obtain visa for Italy, contacting Italian Embassies and facilitating, and whenever necessary, their interaction with the consular offices. Air tickets were purchased through a travel Agency for both trainees and trainers.

4.1.2 Implementation of the first training course

The training course was organized in two parts:

- Distance learning module (mandatory) lasting 3 weeks from 23rd October to 10th November 2017;
- Workshop in Florence lasting 2 weeks from 20 November to 1 December 2017.

The distance-learning module was carried out using the platform Moodle as a learning management system. Moreover, students and teachers of the course used the same platform to share educational material and fulfil training assessment procedures. The platform IBE used is powered by the Institute of Crystallography of CNR. In order to improve the usability of the Moodle platform, IBE customized the DLC layout setting and font styles specifically for the PACC-RRC project. A page for the DLC 2017 was prepared at https://rtc-moodle.ibe.cnr.it/course/view.php?id=52. The distance-learning course was divided into several consecutive units each of them activated following a specific time schedule. Participants were informed once each unit was open. Each unit had a forum where trainers answered the questions of trainees. Quizzes, tests and exercises have been prepared and corrected by trainers. At the end of the DLC, a questionnaire was submitted to trainees in order to evaluate their perceptions on the course.
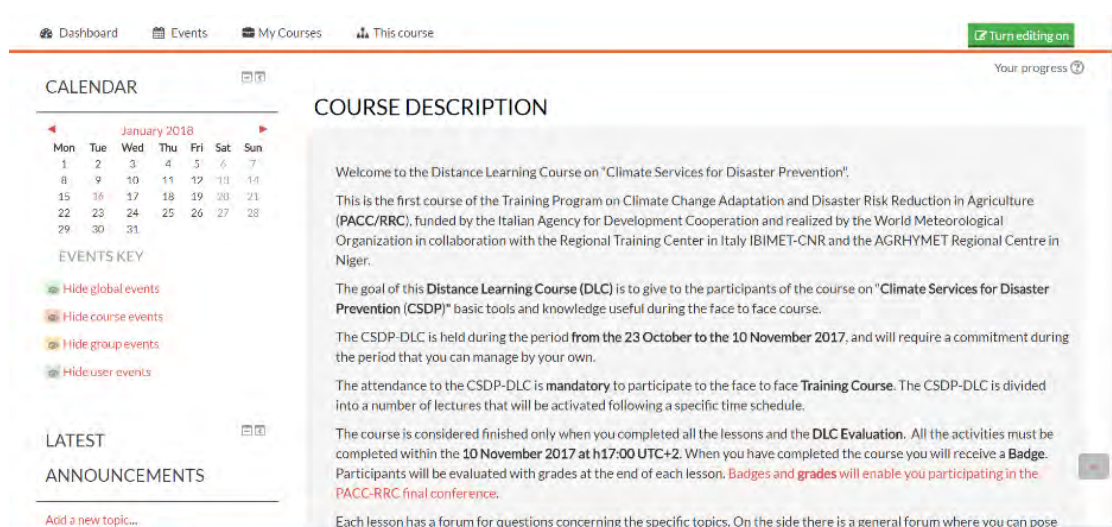

Figure 1, Moodle page for the DLC of the first course

The workshop was held at the CNR Research Area of Sesto Fiorentino, Florence. Two Conference Rooms (one for the opening of 150 places and the other of 50 places for the lessons, were used as well as a

separate room for practical sessions of the afternoons. Moreover, two meetings rooms were used as secretariat office and a room for the use of trainees. Lunches were organized in the cafeteria and coffee breaks in the hall.

Three of the selected participants did not attend the workshop, two for health reasons and one for other personal reasons.

20 trainers were involved in didactical activities. The following is the list of the trainers, in alphabetical order, and their affiliation:

1. Maurizio Bacci, CNR IBE, Italy
2. Marina Baldi, WMO-RTC Italy
3. Michela Biasutti, Columbia University, USA
4. Luca Brocca, CNR IRPI, Italy
5. Federico Fierli, CNR ISAC, Italy
6. Edoardo Fiorillo, CNR IBE, Italy
7. Alessandra Giannini, Columbia University, USA
8. Manuela Grippa - GET, France, Italy
9. Ramona Magno, CNR IBE, Italy
10. Daniele Mastrangelo, CNR ISAC, Italy
11. Samantha Melani, CNR IBE, Italy
12. Tommaso Moramarco, CNR IRPI, Italy
13. Patrick Parrish, WMO, CH
14. Massimiliano Pasqui, CNR IBE, Italy
15. Alessandro Pezzoli, DIST - Politecnico di Torino, Italy
16. Lauro Rossi, CIMA RESEARCH FOUNDATION, Italy
17. Enrico Scoccimarro, CMCC, Italy
18. Vieri Tarchiani, CNR IBE, Italy
19. Maurizio Tiepolo, DIST- Politecnico di Torino, Italy
20. Moussa Waongo, AGRHYMET, Niger

On Tuesday 21 November, at 19.30, a Social Dinner was offered to participants at Osteria la Toscanella, Via la Toscanella 38, Florence. The Shuttle Bus picked-up participants and brought them back after the dinner to the hotel. On Saturday 25 November, at 09.30, a Visit to the Ximeniano Observatory, Borgo San Lorenzo, 26, Florence was organized. The Ximeniano Observatory was founded in Florence more than 250 years ago. Located in an old building of the center, between the Medici Chapels and the Brunelleschi Dome, it preserves precious instrumentation and a rich historical-scientific library, in a fascinating path where the history of seismology, cartography, astronomy, meteorology and radiotechnics are intertwined with the history of the city of Florence and Tuscany. It is still active as a meteorological and seismological observatory; it was founded as an astronomical observatory by Jesuit Leonardo Ximenes in 1756 and continued by the Fathers Scolopi. The visit to the Observatory and its Museum was followed by a lecture on the history of Meteorology in Florence and a coffee break. The Shuttle Bus picked-up participants at the hotel and brought them back after the visit.

The Moodle platform was also used for the workshop. A specific course space, different from the one of the DLC was created at https://rtc-moodle.ibe.cnr.it/course/view.php?id=49
Lectures and other training material were uploaded on the Moodle to allow trainees see and download them. The same page was used also to monitor and evaluate follow-on activities.
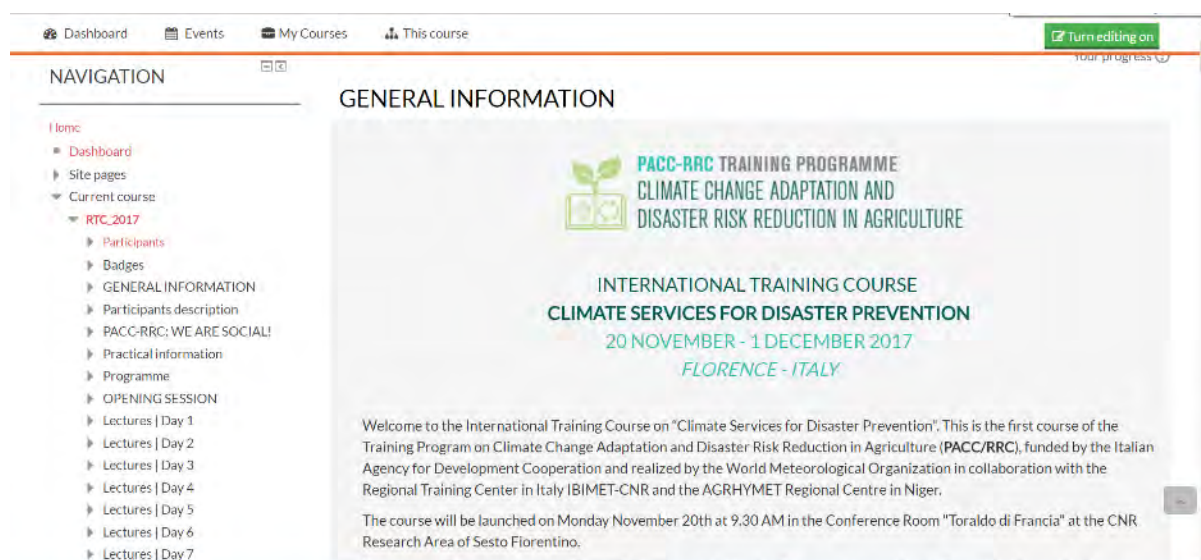
Figure 2, Moodle page for the first workshop

At the end of the course, trainees were evaluated through a specific test. The final test was an 'Interactive with multiple tries" test, so the participants had three attempts to get the right question, but this option had a penalty for each incorrect try. The questions were "single choice" or true/false. The minimum grade needed to pass was 15, 60 the maximum number of points. The participants scored the average value of 42.82 grades, from a minimum of 27 to a maximum of 55.5. The course workshop was also evaluated through a questionnaire. The participants evaluated positively the overall event and the programme. All the participants (100%) consider the knowledge acquired an important asset to contribute more effectively to the activities of their institutions and relevant for their job. The results of the evaluation are discussed in the course report.

For details on the training course, please see the <u>training course report</u>.

4.2 Training Course on agrometeorological Services for Irrigation

4.2.1 Preparation of the second training course

The preparation of the second training course started in September 2017. The announcement was sent by AGRHYMET to beneficiary countries in early December 2017. Following the calls for applications seventy-one (71) applications including 54 men and 17 women were received from 16 countries in the CILSS / ECOWAS area (only Sierra Leone did not send nominations). The list of application sorted by country and gender is reported in Table 3.

Table 5, Number of applications on country and gender basis

N°	CILSS/ECOWAS Countries	Nr of applications	Male	Female
1	Benin	4	3	1
2	Burkina Faso	9	8	1
3	Côte D'Ivoire	2	1	1
4	Cabo Verde	1	1	0
5	Gambie	4	2	2
6	Guinea Bissau	1	1	0
7	Guinea	2	0	2
8	Mali	14	8	6

9	Mauritania	2	2	0
10	Niger	5	2	3
11	Senegal	4	4	0
12	Togo	6	6	0
13	Chad	7	6	1
14	Ghana	3	2	1
15	Libéria	5	5	0
16	Nigéria	2	0	2

The Selection Committee worked on the following criteria:

- A minimum degree of Bachelor + 2 in one of the following disciplines: meteorology, climatology, hydrology, agricultural sciences or farming water management;
- Belong to national hydro-meteorological services, agricultural services of one of the CILSS / ECOWAS member countries, NGOs and projects working in the field of assistance to agricultural production under irrigation in water scarce environment;
- Have basic notions about irrigation software or calculation of crop water requirements;
- Have at least three years of service in support of agricultural production, water management in irrigated areas or integrated management of water resources;
- Speak fluently French or English. Bilingualism was an asset.

At the end of the selection processes, the commission retained twenty-five (25) candidates among which two candidates from Niger did not take part in the online course held from February 1st to 14th 2018.

Of the twenty-five (25) participants selected for the workshop, twenty-three participated to the online-course and twenty-two (22), including six women, participated in the face-to-face course. A participant from Ghana dropped out of the classroom class for health reasons. The list of participants is reported in the following Table.

Table 6, List of participants of the second training course

N°	Last Name	First Name	Country	Participation	
1.	Kakpa	Didier	Benin	Yes	Yes
2.	Ouedraogo	Mahamadou	Burkina Faso	Yes	Yes
3.	Zan	Sima Maurice	Burkina Faso	Yes	Yes
4.	Pereira	Antonino Carlos da Veiga	Cabo Verde	Yes	Yes
5.	De Agnero	Jacques Anselme	Cote D'ivoire	Yes	Yes
6.	Konan Epse Gondo (Mme)	Aya Micheline	Cote D'ivoire	Yes	Yes
7.	Mendy	Leese Benedict	Gambie	Yes	Yes
8.	Sima (Mme)	Fatou	Gambie	Yes	Yes
9.	Lazia	Jeremiah Zusika	Ghana	Yes	Yes
10.	Minkah	Obed Amankwah	Ghana	Yes	No
11.	Diawara (Mme)	Finou	Guinea	Yes	Yes
12.	Mendes	Orlando	Guinea Bissau	Yes	Yes
13.	Kennedy	Guah	Liberia	Yes	Yes
14.	Sarra	Mamadou	Mali	Yes	Yes
15.	N'gaide	Abderrahmane Kalidou	Mauritanie	Yes	Yes
16.	Moussa	Adamou	Niger	No	No
17.	Dignon Bertin (Mme)	Nafissa	Niger	Yes	Yes
18.	Adamou (Mme)	Binta	Niger	Yes	Yes

19.	Souleymane	ARZIKA	Niger	No	No
20.	Borno (Mme)	Maimouna Usman	Nigeria	Yes	Yes
21.	Ndiaye	Diabel	Sénégal	Yes	Yes
22.	Toko (Mme)	Bilha Djako Taba	Chad	Yes	Yes
23.	Ze Zerti	Alifa Warou	Chad	Yes	Yes
24.	Dotou	Amah Toussinam	Togo	Yes	Yes
25.	Kpabeba	Laoukossima	Togo	Yes	Yes
TOTAL			**16**	**23**	**22**

4.2.2 Implementation of the training course

The course was organized in two sessions:

- February 1st – February14th, 2018: distance learning course
- February 19th – March 2nd, 2018: Classroom Learning at the Centre Regional AGRHYMET, Niamey, NIGER (ARC)

The objective of the online training was to enable the participants of the face-to-face workshop to familiarize themselves with some decision support tools such as INSTAT + and CROPWAT software. Handling of these software aimed to give participants the practical bases for the use of these tools for decision making in irrigation management. The online training was facilitated by Dr. Waongo Moussa, Dr. Seydou Traore, Ms. Kaba Elise and Dr. Sanon Moussa. This online phase from February 1 to 14, 2018, was focused mainly on the handling of the two software Instat + and CROPWAT by the participants. The distance learning was delivered using the Moodle platform of the World Meteorological Organization. All online training materials are available on the WMO website http://etrp.wmo.int/moodle/course/view.php?id=144.
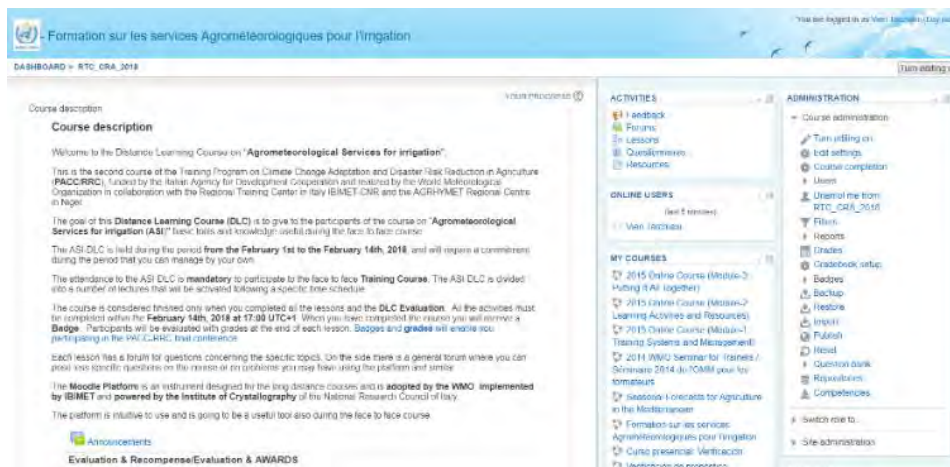

Figure 3, Home page of the distance-learning course on agrometeorological services for irrigation

The face-to-face workshop entitled "Agrometeorological Services for Irrigation" was the first workshop organized by ARC. It aimed at simultaneously addressing the following three challenges: (i) ensuring food security through increased productivity and incomes, (ii) adapting to climate change and (iii) contributing to the mitigation of the impacts of climate change and climate related risk. It was addressed to managers of agrometeorological services for irrigation at to national technical services.

The first week of training was devoted to the presentation of the software INSTAT + including the handling through the presentation of the software environment, data manipulation (data entry, data import, statistics on climate data, etc.) and calculating ETO by using the Instat + software.

The second week of this online training was devoted to FAO's CROPWAT software. This software is mainly

suitable for calculating irrigation water requirements and planning irrigations (quantities and doses). The handling of this software by the participants online was oriented towards the knowledge of the software environment and especially the fundamentals of irrigation.

The technical work of the workshop was preceded by various activities upstream: reception and registration of participants, visit of the ARC, opening ceremony marked by three speeches (Representative of IBE and WMO and AI / CRA) presentation of participants and practical information on the organization of the workshop).

The workshop was moderated by Dr. Moussa Waongo, Scientific Manager in collaboration with Dr. Moussa Sanon, Principal Consultant, Dr. Ibrahim Boubacar, temporary assistant, and Dr. Maurizio Bacci from IBE. Theoretical sessions started with a participatory approach aiming to: (i) use Instat + and cropwat, (ii) strengthen the skills in the field of irrigation, (iii) estimate the water needs of the plant during its different stages of growth, (iv) master water balance calculation and (v) better understand irrigation planning.

The methodological approach of the training privileged the exchanges between the trainers and the participants fostering participants' active participation and involvement in practical activities. At the end of the first week, the CRA trainer team and the consultant adjusted the time allocated to the remaining modules to meet the needs of the participants.

Practical training on INSTAT + and CROPWAT software helped to clarify some misunderstanding that persisted on certain theoretical notions. This balanced approach between the theoretical training and the practical use of climate data analysis and irrigation control software highlighted the complementary of the two approaches and above all a need expressed by participants to combine theory to practice.

For a good assimilation of courses by participants from English speaking countries, some presentations were translated in English. In addition, trainers made efforts to highlight key points in English. In addition, the participatory approach allowed the trainers to encourage participants, especially English speakers, to interact during the presentation when needed for a better understanding.

The educational materials of the training workshop were made available to participants through the Moodle platform. The software, the data needed for the exercises and all the presentations have been made available on the online platform or distributed directly to the participants.

The evaluation of the training by participants based on a scoring grid shows an average score of 3.97 / 5 comparable to Very good. The detailed analysis shows that 74% of the ratings are between good and excellent ratings. Details on the training course and its evaluation are presented in the Course Report.

On Thursday 1th of March, a Social Dinner was offered to participants at the "AGRHYMET Guest House", in presence of AGRHYMET and CILSS executive authorities. A USB key with the PACC/RRC and partners logo was used for storing training material for participants.

For details on the training course, please see the [training course report](#).

4.3 Training Course on Climate Change Impacts Evaluation and Communication

4.3.1 Preparation of the third training course

The preparation of the third training course started in early December 2017. The announcement was sent by WMO to PRs of beneficiary countries in early February and the deadline for application was 11 March.

38 Applications were received as described in the following table.

Table 7, List of applications to the 3rd training course

	CILSS/ECOWAS Countries	Nr of applications		NOT eligible Country	Nr of applications
1	Benin	1	1	Italy	2
2	Burkina Faso	2	2	Switzerland	1
3	Cabo Verde	2	3	Egypt	1
4	Chad	1		**Total 2**	**4**
5	Cote d'Ivoire	3			
6	Ghana	2			
7	Guinea	1			
8	Guinea-Bissau	1			
9	Liberia	3			
10	Mali	3			
11	Mauritania	2			
12	Niger				
13	Nigeria	2			
14	Senegal	1			
15	Sierra Leone	2			
16	The Gambia	2			
17	Togo	2			
	Total 1	**30**			
TOTAL		**34**			

25 participants were selected from the target region, according to the criteria adopted:

- Education Level: to be specialized in meteorology, climatology, hydrology, agricultural sciences, or water management.
- Position/Task: from National Hydro-Meteorological Services, National Agricultural Services, National Platforms for Disaster Risk reduction or Research Institutions from CILSS/ECOWAS Countries
- Basic knowledge of agrometeorological modelling
- Experience: At least 3 years of relevant working experience Climatic risk analysis
- Language: To be proficient in English

Two further participants not requesting financial assistance were also accepted. The list of participants is reported in the following Table.

Table 8, List of selected participants for the 3rd training course

First Name	Last Name	Country, Organization
Adjakobinon Pierre	Dako	Benin, National Meteorological Service
Wendyam Lazare	Sawadogo	Burkina Faso, National Meteorological Service
Alfred	Dango	Burkina Faso, National Meteorological Service
Antonino Carlos Da Voiga	Pereira	Cabo Verde, National Meteorological Service
Maria Alexandrina M. Martins Gomes	Moreno	Cabo Verde, National Meteorological Service
Djergo	Gaya	Chad, National Meteorological Service
Boni Narcisse	Kindia	Cote D'ivoire, National Meteorological Service
Kouakou Augustin	N'zue	Cote D'ivoire, National Meteorological Service
Peter	Gibba	Gambia, National Meteorological Service
Obed Amankwah	Minkah	Ghana, National Meteorological Service
Alhassane	Bah	Guinea, National Meteorological Service

Orlando	Mendes	Guinea Bissau, National Meteorological Service
Spencer S.	Taylor	Liberia, National Meteorological Service
James	Kollie	Liberia, National Meteorological Service
Aissata	Sao	Mali, National Meteorological Service
Issa	Traore	Mali, National Meteorological Service
Hamidou	Coulibaly	Mauritanie, National Meteorological Service
Sid'elemine	Saleck	Mauritanie, National Meteorological Service
Abdulrahman	Garba	Nigeria, National Meteorological Service
Unimke	Akeh	Nigeria, National Meteorological Service
Oumar	Konte	Senegal, National Meteorological Service
Patrick	Musa	Sierra Leone, National Meteorological Service
Ibrahim Sinneh	Kamara	Sierra Leone, National Meteorological Service
M'poh	N'koyi	Togo, National Meteorological Service
Laoukossima	Kpabeba	Togo, Agrometeorology Service
Hari Prasad	Vajja	United Nations Institute For Training And Research

Following the selection, administrative procedures for acquiring goods and services were launched, for travels, participants' accommodation, local transportation, coffee breaks and lunches.

Trainees were supported in the process of obtaining visa for Italy, contacting Italian Embassies and facilitating when necessary their interaction with the consular offices. Air tickets were purchased through a travel Agency for both trainees and trainers.

4.3.2 Implementation of the training course

Through the course, participants were expected acquire theoretical and practical knowledge on current approaches to assess climate change impacts in West Africa, with emphasis on:
General aspects of agro-climatic analysis using observed and projected climatic datasets
- Fundamentals of agro-climatic modelling for impact assessment
- Communication of climatic information
- Operational application of geostatistical analysis tools for agro-climatic risk analysis and assessment.
The training course consisted of two parts:

- Distance learning module (mandatory) from 28th May to 22th June 2018;
- Workshop in Florence from 25th June to 06th July 2018.

The distance learning module was carried out using the platform Moodle as a learning management system. Moreover, students and teachers of the course used the same platform to share educational material and fulfil training assessment procedures. The platform IBE used is powered by the Institute of Crystallography of CNR. In order to improve the usability of the Moodle platform, for this third course IBE further customized the DLC layout. Moreover, on May 25th 2018 the GDPR - the General Data Protection Regulation (EU) 2016/679 - became enforce replacing the data protection directive (officially Directive 95/46/EC) from 1995. This required some technical interventions in order to make the Moodle Deployment compliant with the GDPR regulation. A specific plugin was activated to apply GDPR to the existing users and to the new ones; a new privacy policy has been edited and published on the Moodle platform. The registering process was modified: the registration was made open, but the enrollment to PACC2018 (or future courses) required a specific key depending on the role (trainee, trainer, non-editing teacher). The enrolment key was sent to the participants with the new instruction.

In order to improve the usability of the Moodle platform, a new core theme (Boost) was used, to have better navigation within and between courses, and more space on the screen for the content. Another change was to create a unique deployment for the whole course (DLC and Workshop) to better manage badges, grades and activity completion.

The distance-learning course was divided into several consecutive units activated following a specific time schedule. Participants were informed once each unit was open. Each unit had a forum where trainers answered the questions of trainees. Quizzes, tests and exercises have been prepared and corrected by

22

trainers. At the end of the DLC, a questionnaire was submitted to trainees in order to evaluate their perceptions on the course.
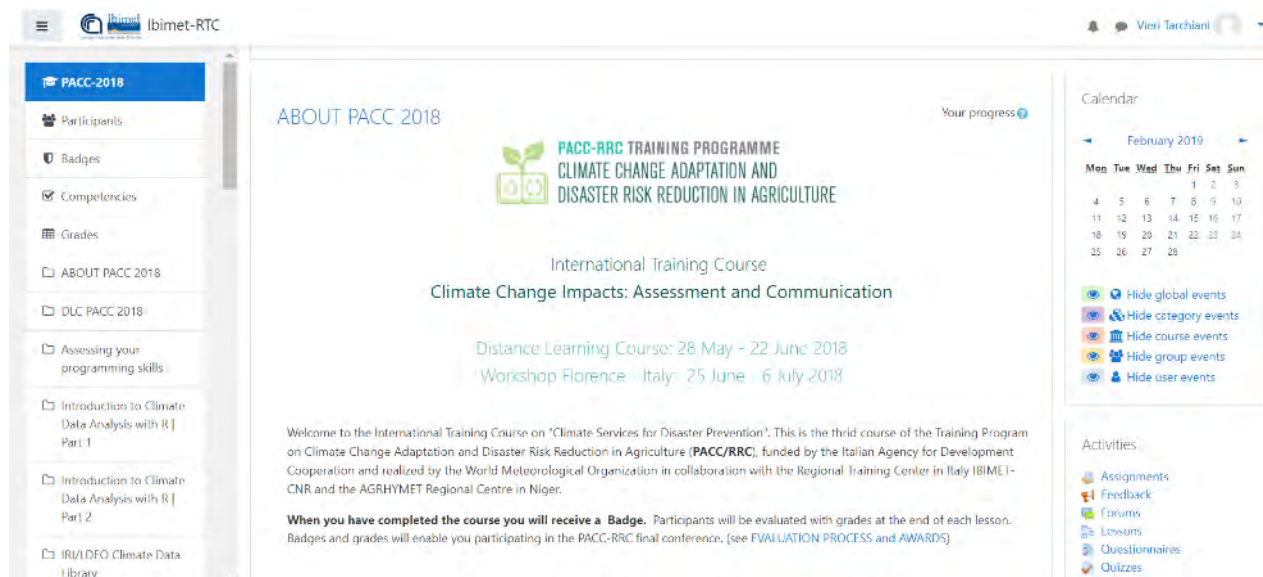

Figure 4, Moodle page of the third course (https://rtc-moodle.ibe.cnr.it/course/view.php?id=56)

The workshop lasted 2 weeks, from 25th June to 06th July 2018. It was organized at the CNR Research Area of Sesto Fiorentino. The objective of the training course was to strengthen the capacities of National Technical Services for assessing and communicating the impacts of climate change on agriculture, through the application of research products and operational tools. The workshop was conceived as a 50-50 balance of theoretical and practical sessions.

The topics covered by the workshop include:

1. Climate Data and Projections
2. Agroclimatic Modelling for Impact Assessment
3. Communication of Climatic Information
4. Practical exercises (afternoons)

Only 2 participants, out of the 27 registered, could not attend the course, which finally gathered 25 trainees from 16 different countries of West Africa.

An impressive team of trainers has been mobilized, hereafter the names of trainers and their affiliation:

1. Maurizio Bacci, CNR IBE, Italy
2. Marina Baldi, WMO-RTC Italy
3. Christian Baron, CIRAD, France
4. Lazreg Benaichata, Université IBN Khaldoun, Algerie
5. Luca Brocca, CNR IRPI, Italy
6. Marta Bruno Soares, University of Leeds, UK
7. Claudio Cassardo, University of Turin, Italy
8. Giorgia Ceccarelli, OXFAM, Italy
9. Tanja Cegnar, Slovenian Environment Agency, Italy
10. Ylenia Curci, Université de Strasbourg, France
11. Luc Descroix, IRD Marseille, France
12. Edmondo Di Giuseppe, CNR IBE, Italy
13. Roberto Ferrise, UNI DISPAA, Italy
14. Marco Gaetani, Latmos-IPSL, Sorbonne Universités, France
15. Ramona Magno, CNR IBE, Italy
16. Emmanuel Oladipo, University of Lagos Nigeria

17. Patrick Parrish, WMO, CH
18. Massimiliano Pasqui, CNR IBE, Italy
19. Elena Rapisardi, CNR IBE, Italy
20. Benjamin Sultan, Latmos Univ Curie Paris, France
21. Vieri Tarchiani, CNR IBE, Italy
22. Jost Von Hardenberg, CNR ISAC, Italy
23. Moussa Waongo, AGRHYMET, Niger
24. Federica Zabini, CNR IBE, Italy

A Social dinner was organized on Wednesday July 4 at the restaurant "Il Vecciolino" on the Monte Morello mountain. A visit to the Chianti Observatory (http://www.osservatoriochianti.it/) was organized on Saturday 30 June where participants could see some agrometeorological instruments as well as an operational precision agriculture system for operational monitoring agrometeorological conditions in vineyard farms. After the visit a lunch was offered to participants.

The Moodle platform was also used for the workshop. Lectures and other training material were uploaded on the Moodle to allow trainees to see and download. The same page was used also to monitor and evaluate follow-on activities.

At the end of the course, trainees were evaluated through a test. The final test was an 'Interactive with multiple tries" test, so the participants had three attempts to get the right question, but this option has a penalty for each incorrect try. The penalty is a proportion of the total grade. Each question values three marks and the penalty for each incorrect try was 1/3. Example: the right answer on the first try is 3 scores, 2 on the second try, and 1 on the third try. The questions were "single choice" or true/false. The minimum grade needed to pass was 45, 90 the maximum number of points. The participants scored the average value of 55.71 grades, from a minimum of 45 to a maximum of 90. The results of the evaluation are in the course report.

For details on the training course, please see the training course report.

4.4 Training Course on Agrometeorological Services for Rainfed Crops

4.4.1 Preparation of the fourth training course

The preparation of the fourth training course started in July 2018. The announcement was sent by AGRHYMET to beneficiary countries in early September 2018. As of September 25th, thirty-four files (34) including 33 applicants for PACC-RRC funding and 1 postulant sponsored by its service have been received from 16 CILSS / ECOWAS countries.

Table 9, Number of applications by country

N°	CILSS/ECOWAS Countries	Nr of applications
1	Benin	2
2	Burkina Faso	3
3	Côte D'Ivoire	3
4	Cabo Verde	2
5	Gambie	6
6	Guinea Bissau	3
7	Guinea	1
8	Mali	1
9	Mauritania	2
10	Niger	2

11	Senegal	1
12	Togo	2
13	Chad	1
14	Ghana	1
15	Libéria	3
16	Nigéria	1

The same selection criteria used for the first course was applied. In total, the committee retained 26 participants (21 men and 5 women) from 16 CILSS / ECOWAS countries involved in agro-meteorological information production and monitoring of food security.

Table 10, List of participants 4th course

N°	Name	Country, Organisation	Position	Sex
1	Raphael Fustel Djaou ZEKPETE	Benin, Météo Bénin	Météorologue	M
2	Mme Houefa valerie SOUNOUKE	Benin, Météo Bénin	Météorologue	F
3	Grégoire BAKI	Burkina Faso, ANAM – BF Application Météorologique	Agent	M
4	Sima Maurice ZAN	Burkina Faso, DGRE/DEIE	Agent Service Hydrologie	M
5	Antonino carlos DA VIEGA PEREIRA	Cabo Verde, Institut National de la Météorologie et Géophysique	Directeur Service Agrométéo, CC et de la qualité de l'air	M
6	Kodjenini Augustin MIAN	Côte d'Ivoire, SODEXAM	Chef de Service Agrométéo	M
7	Konan Sebastien KOUAME	Côte d'Ivoire, Ministère de l'Agriculture	Sous-Directeur	M
8	Augustin N'ZUE KOUAKOU	Côte d'Ivoire, SODEXAM/DMN	Chef de Service Développement et Environnement	M
9	Peter GIBBA	Gambia, Department of Water Resources	Chief Meteorologist	M
10	Tijani BOJANG	Gambia, Meteorological Services (DWR)	Head of Forecasting	M
11	Demba BAH	Gambia, Department of Agriculture	Agricultural Office	M
12	Jeremiah Zusika LAZIA	Ghana, Meteorological Agency	Meteorologist	M
13	Aboubacar SOUMAH	Guinea, Direction Nationale de la Météo	Chargé d'observation en Guinea	M
14	Madame Da Viega Fernandes Eudalice Vanuza	Guinea Bissau, Direction Générale des Ressources Hydriques	Technicien Service d'Hydrologie	F
15	Orlando MENDES	Guinea Bissau, Institut National de la météorological	Directeur de Service de Climatologie	M
16	Princess M. TARPEH	Liberia, Meteorological Service	Agrometeorological Technician	F
17	James Leviticus KOLLIE	Liberia, Meteorological Service	Agriculture Meteorological Technician	M
18	Mme Diakité Aissata MALLE	Mali, Météo	Agrométéorologiste	F
19	Abderrahmane Kalidou N'GAIDE	Mauritanie, Météo	Chef Service agrométéo	M
20	Sid Elemine AHMED	Mauritanie, Météo	Chef de Service Climatologie	M
21	Nazirou TOUNE	Niger, DMN	Météorologue	M
22	Mme Ousmane Binta Adamou	Niger, DMN	Agrométéo	F
23	Adeleke John OYEGADE	Nigeria, NIMET	Meteorologist	M
24	Mamadou Lamine DIOP	Senegal, ANACIM	Agrométéorologie	M
25	Gaya DJERGO	Chad, ANAM	Chef de Division Agrométéo	M
26	Laoukossima KPABEBA	Togo, DGMN	Chef division Agrométéo	M

4.4.2 Implementation of the training course

On the organizational level, the training was organized according to the following format:

1. Online training organized from 1 to 14 October 2018 to familiarize participants with the concepts of agrometeorology, and the installation and ownership of agrometeorological decision support tools. The tools chosen were the same as those used for the practical exercises during the face-to-face workshop. These are (i) INSTAT + and R-INSTAT, and (ii) SARRA-H and SARRA-O with Quantum GIS;
2. Face-to-face training at AGRHYMET in Niamey, Niger, from October 29 to November 09, 2018 focused on:
   a. Theoretical and practical sessions: (i) general bases and concepts in agrometeorology; (ii) agro-meteorological products and services: use of satellite information, special decision-makers bulletins; (iv) determination of the characteristics of the agricultural season; (v) presentation and usefulness of tools for in situ measurements of agrometeorological parameters (Agrometeorological Park and the Automatic Meteorological Station of ARC); (vi) Agrometeorological modeling (vii) evaluation of the potential impacts of climate change on crop yields
   b. Hands-on sessions: (i) Exercises on determining the characteristics of the agricultural season using INSTAT + and R-INSTAT ;; (ii) Agrometeorological modeling: Introduction; Soil-plant-atmosphere relationships; Monitoring crop status and yield forecasts; (iii) Presentation and process of plant development; (iv) software practices (presentation of SARRA-H; formatting of input data, etc.; installation and demonstration of the SARRA-O model; exploitation of SARRA-O results with Quantum GIS); (v) Assessment of the potential impacts of CC on crop yields in the CILSS / CEDEAOS area; (vi) Climate Scenarios: Procedures for extracting data from CORDEX-Africa models.

The online training was organized on CRA's Moodle platform. The platform was managed by Ms. Kaba Elise and Dr. Moussa Waongo. The animation and follow-up were provided by Dr. M. Waongo, Dr. S. Traore, Mr. E. Sarr and Mrs. Elise Kaba.

The workshop was facilitated by Dr. Seydou Traore, Scientific Manager in collaboration with Mr. Christian Barron, Principal Consultant, Dr. Maurizio Bacci of IBE, Dr. Ibrahim Boubacar, temporary trainer, and CRA experts, in particular Dr. Moussa Waongo, Dr. Alhassane Agali, Mrs. Lucie Namodji, Mr. Henri Songoti and Mr. Francisco Gomes.

The mornings sessions were mainly reserved for the theoretical training aspects and those of the afternoons for the practical trainings, notably the exercises and other applications on the software.

For good assimilation of courses by Anglophone participants, some presentations were translated into English. The trainers also made the effort to hold the training in both English and French.

For the details of the training and its evaluation please refer to the course report.

4.5 Training Course on Climate and Risks Communication

This training course was added to the initial program of activities with a final no cost extension. It was originally planned as a blended distance and face-to-face training course with the workshop to be held in Florence on March 2020. Unfortunately, the COVID-19 pandemic didn't allow to realize the workshop and it was transformed in a synchronous distance learning delivered from October-November 2020.

4.5.1 Preparation of the training course

The preparation of the fifth training course started in October 2019. The announcement was sent by WMO to beneficiary countries on November 11th 2019.

As of December 15th, thirty-four files (19) including 12 applicants for PACC-RRC funding and 7 postulants sponsored by ANADIA2 project and METTLESAT (DRC) have been received from 13 countries

(CILLS/ECOWAS plus DRC, Cameroon and Madagascar).

Following selection, administrative procedures for acquiring goods and services were launched, for the travels of trainers, participants' accommodation, local transportation, coffee breaks, lunches and interpretation (the course was planned in French).

Trainees were supported in the process to obtain visa for Italy, contacting Italian Embassies and facilitating, and whenever necessary, their interaction with the consular offices.

4.5.2 Implementation of the training course

The training course was originally organized in two parts:

- Distance learning module (mandatory) lasting 4 weeks from 24/02/2020 to 20/03/2020;
- Workshop in Florence lasting 1 week from 23 to 27 March 2020.

The distance-learning module was started in the due time using the TOPACS module on Communication.

On 2 March, due to the unfortunate circumstances of the coronavirus (COVID-19) outbreak, WMO suggested to reschedule the international training course from 28 September to 2 0ctober 2020 and later in June 2020 it was decided to completely transform the face-to-face course in a synchronous distance learning to be carried out from 1 October to 5 November 2020.

The course structure included six modules and each module focusing on one topic. For each module a synchronous learning part, with a webinar and live chat/discussion, and also an asynchronous part with forums, or videos/audios, or documents, or external resources. Exercises, specific for each module, were asynchronous assignment (file submission) but also virtual classrooms and roleplay.

The file submission was followed by a live discussion of the results.

The training course was implemented on the distance learning platform Moodle of RTC-Italy. For the webinars, we used the Zoom application.

The Moodle platform used by the RTC-IBE is powered by the Institute of Crystallography of CNR and is managed by Guido Righini in collaboration with Marco Simonetti.

Twenty-three people coming from BENIN, BURKINA FASO, CAMEROON, DRC, GUINEA, MADAGASCAR, MALI, MAURITANIA, NIGER, RWANDA, SENEGAL, TCHAD, TOGO enrolled in the course. Two of them could not participate due to work commitments.

Table 11, List of participants

Country	Name	Organization
BENIN	Eng Joseph BESSOU	METEO BENIN
BURKINA FASO	Mr Wendyam Lazare SAWADOGO	ANAM
BURKINA FASO	Mr Guillaume NAKOULMA	ANAM
CAMEROON	Mr Cedric Elsy SIELATCHOM NGALAHA	Univ of Yaounde 1
DRC	Mr Matondo DIVENGELE	METTELSAT
DRC	Miss Rachele MWIKA KITUMBA	METTELSAT
DRC	Mr Enoch NZAU MANANGA	METTELSAT
DRC	Mr Serge BOOTO	METTELSAT
GUINEA	Mr Maoro BEAVOGUI	DMN
GUINEA	Ms Fatoumata Binta DIALLO	DMN
MADAGASCAR	Ms Omega Huguette RAHARIMALALA	DGM
MADAGASCAR	Ms Hanitra Elisa RASOAVOLOLONIAINA	DGM
MALI	Ms Fatoumata SANGHO DIABATE	MALI METEO
MAURITANIA	Eng Mohamed BEKRIN	ONM
NIGER	Mr Bouba ASSOUMANA	DMN

NIGER	Mr Youchaou OUSMAN BAOUA	DMN
NIGER	Mr Nazirou TOUNE	DMN
RWANDA	Mr Alexis NZEYIMANA	RMS
SENEGAL	Mr Abdoulaye DIAKHATE	ANACIM
TCHAD	Eng Nassour SALEH TERDA	DMN
TOGO	Mr Nassame DJAWE	DGMN

We involved 16 trainers of which some belonging to CNR but other to national and international organizations among which ECMWF, PIK, WMO, AGRHYMET, University of Minnesota. The course was opened by Marina Baldi, Director of the WMO-RTC, and an introductory speech was offered by Patrick Parrish of WMO-ETR. A short welcome message of the Italian PR at WMO, Gen Silvio Cau was offered in French.

A crucial element of training is the language. We decided to realize the course in French for French speaking countries. Throughout the course we provided simultaneous translation because some of the trainers were not native French speaking and communication requires precision, accuracy and linguistic familiarity to capture nuances and build the right "tone of voice". The video recordings made available through the Moodle platform were also in French.

Participation to synchronous activities has seen on average 13/21 participants which were usually the same participants. There is no doubt that many participants actively participated and were committed to doing the exercises and achieved excellent results. Some others were not so engaged and did not achieve the activities' goals. The exercises included: contribution in forums, creation of documents based on schemes, original conception of a document or other types of files. During the course some group discussions were held. Participation was intense and one of the most interesting was on the problems participants face with media.

As a final task to complete the course the participants were asked to respond to the evaluation questionnaire on the Moodle platform. The general participants' perception of the course was positive.

Knowing that there could have been internet problems, we also provided webinar recordings in French, so participants could watch the webinars and slide presentations offline, if needed.

This course included two certification types: the certificate of participation and the badge. The criteria for the certificate of participation: attending 70% of the webinars. The criteria for the badge: obtaining the certificate of participation and completing the majority of the exercises. Out of 21 participants, 14 received the participation certificate and 8 the badge. Badges are Open badges linked to the Badgr open badge system that can be managed by participants through the badgr.com platform.

There was general satisfaction on the course among participants. Also, from organizers point of view, it was a positive and surely valuable experience for the future.
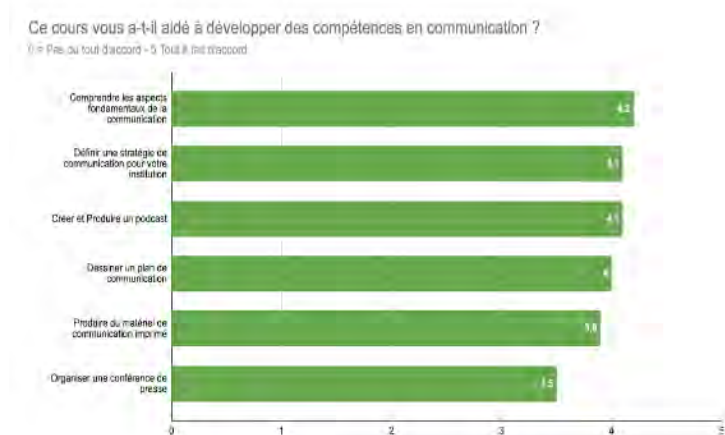

Figure 5, Participants' skills strengthened

Nevertheless, the participation was less than expected (14/21) and the full completion of the training course even lower (8/21). Several reasons can be considered for explaining the low participation, hereafter some consideration not in order of importance:

- The topic: Communication is a complex subject to be treated in a training course and requires interaction and understanding between trainers and trainees. A full distance learning is probably not the best approach to deliver it. Indeed, the course was originally planned as a blended course with an online module and a presence workshop. Because of the Covid-19 pandemic the workshop was cancelled and converted in a full online course. Distance learning is more suitable for dealing with a technical and specific subject, while the course had a horizon that was perhaps a little too broad and then difficult to follow for not very engaged participants.
- Engagement: the selection process was carried out at the beginning of 2020 with the perspective of a blended distance-presence training course. Afterward, the presence workshop was converted into a distance event, probably disappointing the expectation of some participants. Indeed, following a distance learning course demands much stronger motivation than a presence workshop, and the modality of delivery should be clear before the submission of candidatures. That's also confirmed by the fact that participants added after the decision to hold the course via distance learning (from Rwanda, Madagascar, DRC, Cameroun) demonstrated stronger engagement and performed better.
- Technical issues: internet connection is a real problem for some countries, but probably the main challenge for some participants was limited digital skills. Therefore, many problems in using the Moodle platform as well as the Zoom video conferencing tool arose.

For details on the training course, please see the training course report.

5. Networking Conference

The organization of the Networking conference started in early July 2018.

The concept note of the conference was prepared at the beginning of October 2018. The networking conference was planned to be held in Rome, Italy, on 4 and 5 February 2019. The conference was intended to gather those in high-levels of responsibility in the Ministries to which NMHS belong and coordinate with, as well as the Directors of Meteorological Services of the Region. The conference objective was to further promote the strategic collaboration of involved countries with WMO and Italy. The final goal of this conference was to enhance technical and scientific cooperation among National Meteorological Services and to promote strategic collaboration on capacity development, in the perspective of providing operational climatic services for disaster risk reduction and adaptation to climate change in agriculture and other key sectors.

A survey was prepared and distributed to participants together with the invitation: PACC-RRC Conference - Survey on Capacity Development for Climate Services. The aim of the survey was to provide the context and the justification for a future collaborative initiative on capacity development supporting the operational implementation of Climate Services in West Africa.

WMO sent the Announcement to the Networking Conference to PRs at the end of November 2018, and by the end of December we established the final list of participants:

Table 12, Participants to the networking conference

Country	Nominated By	Nominated participants
Benin	Mr Marcellin Kokou NAKPON	Mr Marcellin Kokou Nakpon (PR)

Burkina Faso	Mr Kouka Ernest OUEDRAOGO	Mr Kouka Ernest Ouedraogo (PR)
Burkina Faso	Mr Kouka Ernest OUEDRAOGO	Mr Florent Bakouan
Cabo Verde	Ms Maria DA CRUZ SOARES	Ms Denise Semedo De Pina
Cabo Verde	Maria DA CRUZ SOARES	Mr Francisco Da Vega Correia
Chad	Mr Jules Dandjaye DAOUNA	Mr Daouna Jules Dandjaye (PR)
Chad	Mr Jules Dandjaye DAOUNA	Nembontar Djekoula Midebel
Cote d'Ivoire	Mr Daouda KONATE	Mr Daouda Konate (PR)
Cote d'Ivoire	Mr Daouda KONATE	Mr Koffi Rodrigue N'Guessan
Gambia	Mr Lamin Mai TOURAY	Mr Lamine Mai Touray (PR)
Ghana	Dr Michael MAWUTOR TANU	Mr Michael Mawutor Tanu (PR)
Guinea	Dr Mamadou Lamine BAH	Mr Yaya Bangoura
Guinea	Dr Mamadou Lamine BAH	Mrs Houssainatou Barry
Guinea-Bissau	Dr João Lona TCHEDNÁ	Mr Fernando Baial Sambu
Liberia	Mr Arthur GAR-GLAHN	Mr Arthur Gar-Glahn (PR)
Liberia	Mr Arthur GAR-GLAHN	Hon. D. Caesar Freeman, II
Mali	Mr Djibrilla Ariaboncana MAIGA	Mr Mamadou Samake
Mauritania	Mr Mohamed Batta CHEIKH MOHAMD EL MAMY	Mr Mohamed Batta Cheikh Mohamd El Mamy (PR)
Mauritania	Mr Mohamed Batta CHEIKH MOHAMD EL MAMY	Mr. Mamadou Lam
Niger	Ms Aissatou SITTA	Ms Aissatou Sitta (PR)
Niger	Ms Aissatou SITTA	Mr Amadou Diallo Issifi
Nigeria	Prof. Sani Abubakar MASHI	Prof. Sani Abubakar Mashi (PR)
Nigeria	Prof. Sani Abubakar MASHI	Ahmad Abdullahi Bello
Senegal	Mr Magueye Marame NDAO	Oumar Konté
Senegal	Mr Magueye Marame NDAO	Bounama Dièye
Sierra Leone	Mr Ibrahim Sinneh KAMARA	Mr Ibrahim Sinneh Kamara (PR)
Sierra Leone	Mr Ibrahim Sinneh KAMARA	Mr Gabriel Kpaka
Togo	Mr Latifou ISSAOU	Dr Latifou Issaou (PR)
Togo	Mr Latifou ISSAOU	Mr Rahim Ouro-Salim
Nigeria	WMO/IBE	Prof Emmanuel Oladipo
ECOWAS	n/a	Mr Johnson Boanuh
CILSS	n/a	Mr Ibrahim Lumumba IDI-ISSA (Vice Executive Secretary)

Student Cote d'Ivoire	IBE	Ms Veronique Bomo Manouan
Student Guinea-	AGRHYMET	Mr Orlando Mendes
Student Cabo Verde	IBE	Ms Maria Alexandrina Mendes Martins Gomes Moreno
Student Benin	AGRHYMET	Ms Houefa Valerie Sounouke
WMO staff	n/a	Yinka Adebayo
WMO staff	n/a	Patrick Parrish
WMO staff	n/a	Robert Stefanski
WMO staff	n/a	Bernard Gomez
Slovenia	n/a	Tanja Cegnar
UK	n/a	Carlo Buontempo
AGRHYMET	AGRHYMET	Dr. Souleymane Ouedraogo (DG)
AGRHYMET	AGRHYMET	Dr. Moussa Waongo

Meanwhile, IBE started the procedures for acquiring the goods and services needed for the conference: transportation tickets, accommodation, coffee breaks and lunches, dinner and so on.

The conference was held in the historical conference hall of CNR headquarters in Rome. The programme was organized in two days. Despite some last-minute issues with visas and flights almost all participants arrived in Rome. Participants that could not attend have been:

- Mrs Houssainatou Barry – Guinea
- Mr Amadou Diallo Issifi – Niger
- Mr Ahmad Abdullahi Bello – Nigeria
- Mr Ibrahim Sinneh Kamara – Sierra Leone

The final networking event brought together 76 participants from 21 countries, including representatives of 3 embassies and 6 international organizations. The event was designed to provide a venue for decision makers and experts in the project region to discuss outcomes, examine continue needs, and consider follow-on capacity development initiatives.

Figure 6, Participants to the Conference in Rome

After the presentation of the PACC-RRC Programme, the discussion was focused on the lessons learnt.

The good practices implemented by the project are:

- Collaboration Multi-disciplinarity
- Connectivism
- Innovation in education approach
- Technical-scientific network and huge trainer team
- Good balance between science and operational services
- Working in groups
- Case studies
- Mentoring and post workshop activities
- Customization of Moodle platform and Mobile solutions
- Valorization and re-use of training resources
- Interoperability of DL

The main problems the project had to face have been:

- Language gap
- Skill of participants
- Internet
- Time to complete the Distance Learning
- Engagement in the Post workshop
- Usability and low users experience

The recommendation coming from the project are:

- Offline solutions for distance learning
- More time for DL
- More time to practical sessions using case studies
- Case studies on real data
- Field trips
- Improve sharing initiatives between participants
- Improve Moodle deployment on a Knowledge and Skills basis
- Increase the number of participants for distance learning
- Mitigate the language gap without investing in it too many resources
- Making available the training materials to all the students of all the courses

- Improve sustainability of training by sharing resources
- Language gap to be considered in recruitment process of NMHSs.
- Strengthening of NMHSs in terms of Internet

A further very useful and interesting session was the one dedicated to Climate Services and capacity development in West Africa, experience from the NMHSs. The main results are synthetized in the conclusions of this report, showing that a large experience already existed in the region.

The second day was mainly dedicated to the discussion on needs and options for a new capacity development initiative, and to the production of a final statement.

The Conference Statement includes acknowledgement of the successes of the project, areas for improvement, and a commitment to seek additional opportunities and resources to build upon the project outcomes. For further details see the Conference report.

6. Support and Mentoring

6.1 Follow-on and Monitoring

The training courses have been subjected to an effectiveness evaluation based on the Kirkpatrick[1] evaluation model, at the first three levels: Reaction, Learning and Transfer. Therefore, activities have been evaluated at multiple levels:

- The response to each module (Distance learning and workshop for each course) was evaluated for the initial opinions of participants on the relevance, effectiveness, engagement, and impact of the intervention. This feedback was gathered via surveys.

- Learners were evaluated to identify what was learned, what improvements could be made to the activities, and what additional interventions could be called for to reach the desired outcomes. This was evaluated through practical exercises and quizzes covering essential course content for both distance learning and workshops.

- Long-term impacts were measured by assessing how learning impacts practice within the participant's organization. This provides information on how future interventions might be improved, or how follow-on project activities can be improved.

Long-term impacts have been evaluated for the four courses through the follow-on activities. Post-workshop activities required by participants are:

1. Preparation of a poster (typical conference poster) presenting an application of acquired knowledge on a case study relative to their own country/area. Posters were evaluated and ensured a badge. Best posters were presented at the final networking conference.
2. Sharing the course content in the participant's local institution. This was evaluated based on evidence documented in multiple formats. Participants sent pictures of the events they organized in their own countries, the programs of the events and in some cases, they organized more structured initiatives including demonstration activities, hands on sessions, etc.

An award has been granted to the participants that best performed in each training course, including the follow-on activities, based on the acquired badges and a qualitative assessment. The 4 winners, one for each course, were invited to the final networking conference in Rome to present their poster and training experience.

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[1] Kirkpatrick D. L., *Evaluating Training Programs: The Four Levels*. San Francisco: Berrett-Koehler Publishers, 1994.

Table 13, The four students awarded with the participation at the conference

Course	First Name	Last Name	Country
Climate Services for Disaster Risk Reduction	Veronique Bomo	Manouan	Cote d'Ivoire
Climate Services for irrigation	Orlando	Mendes	Guinea Bissau
Climate change: impacts evaluation and communication	Maria Alexandrina	Moreno Mendes	Cabo Verde
Climate Services for Rainfed Crops	Houefa Valerie	Sounouke	Benin

6.2 TOPACS

In order to build long-term sustainability of the project results, as indicated in the Operational Programme and also recommended by the networking conference, learning materials developed within the project will be made available for further use by trainees and their respective institutions but also to other institutions.

In this perspective, a course package was created in order to offer a solution to deliver courses and learning materials on a long-term basis and for a wider audience than project direct beneficiaries, extending the impact of the PACC/RCC project.

TOPACs originated from the recommendation of main stakeholders in West Africa, the Directors of Meteorological Services of 17 CILSS/ECOWAS Countries at the International Conference on Climate Services for West Africa in Rome, Italy, early 2019. The main goal is to build Knowledge and Skills through customizable learning paths within the Climate Services Competencies framework of WMO ensuring coherence with other WMO education initiatives (Global Campus, other RTCs, etc.). The methodological approach is based on the competency-based approach to training, where competencies are composed of elements of Knowledge and Skill, according to the European Qualifications Framework for Lifelong Learning, and related to the WMO Climate Services competencies framework. The overall Knowledge and skills taxonomy have been co-designed with stakeholders at different levels.

During the project, the first design of the TOPACS was produced, including the definition of the overall strategy and architecture of the TOPACS as well as the definition of the Information Architecture of the lessons/courses.

The approach was discussed in a teleconference held on 2nd of April to which participated:
- Mustafa Adiguzel- WMO
- Marina Baldi- CNR
- Luciane Veeck- WMO
- Elena Rapisardi- CNR
- Patrick Parrish- WMO
- Barbara Bourdelles- INP ENM
- Vieri Tarchiani- CNR

Subsequently, we started the setup and customization of the Moodle platform in order to allow Competency-based learning. A new deployment has been installed on the servers of the Institute of Crystallography, who manages the CNR Moodle Platform. This deployment was used for the tests.

In parallel, we engaged in the content production. Among all the lectures available from the PACC courses we selected those that could be successfully adapted for distance learning.

Lectures have been classed in 11 small courses. For each course, knowledge and skills to be acquired have been defined. Moreover, each course has been linked to one or more WMO Competencies for Climate Services Providers.

The idea was to create in Moodle a Competency Framework (CF), using the specific functionality, to reproduce the WMO CF for Climate Services Providers (CFCSP) using level 1 (Competencies) and level 2 (Performance criteria) and linking below the specific knowledge and skills of each course.

The problem we faced was that the Moodle CF has a rigid hierarchical structure according to an individual learning perspective, while WMO CF has a working perspective within institutions. This means that WMO Competencies can be acquired and assessed only in the workplace and often refers to a team and not to an individual. Therefore, the skills and knowledge acquired through one of TOPACS courses refers to many WMO competencies of level 1 and/or level 2. But the Moodle CF doesn't allow to create these one-multi relations because of its hierarchical structure.

The solution we adopted was therefore to use in parallel the two different CFs and the link among them is the course.
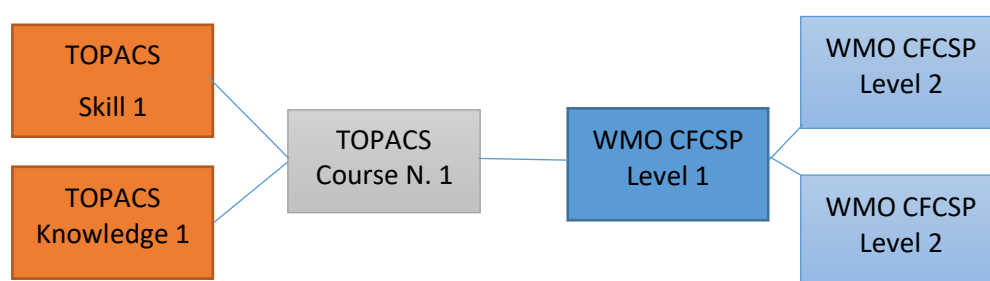

Figure 7, Competency framework of TOPACS

In parallel, videos and audios acquired during the training have been controlled. Trainers were requested to allow the reuse of their materials through a creative commons license. In case the trainers didn't accept the reuse, we asked for further materials they could provide to build the lecture. Therefore, some materials not used during the PACC courses have been added to the TOPAC. For many lectures a video has been edited with opening/ending titles. 20 videos have been uploaded on YouTube. Some further materials have been added, as papers, documents, etc.

The list of courses and relative lectures is in the following table.

Table 14, List of TOPaCS courses

Course	Lecture	Author	Organization
Basics of Agrometeorology	Introduction to Agro-climatology	Maurizio Bacci	IBE-CNR
	Climate changes and agriculture: examples in West Africa	Benjamin Sultan	IRD
	Crop modeling – Basic concepts	Roberto Ferrise	UniFlorence
	Introduction to Cropsyst software	Maurizio Bacci	IBE-CNR
	Agroclimatic modeling in West Africa - (SARRA-O)	Christian Baron	CIRAD
	Vegetation monitoring tools and methods	Ramona Magno	IBE-CNR
Climate Change Impacts	Sahelian lands evolution and climate change	Luc Descroix	IRD
	Climate Change Agriculture and Food Security	Giorgia Ceccarelli	Oxfam
	The economic impacts of climate change	Ylenia Curci	UniStrasbourg
	Mainstreaming Climate Change into Country Strategy Papers	Emmanuel Oladipo	UniLagos
	Risk communication in a climate change context	Marina Baldi	IBE-CNR

Climate Communication	The complexity of Climate Change Communication	Tanja Cegnar	Slovenia Met. Agency
	Precision Information: a word in not enough	Elena Rapisardi	IBE-CNR
	Communicating uncertainty	Marta Bruno Soares	UniLeeds
	Climate services as communication Tools	Marta Bruno Soares	UniLeeds
Climate Data Analysis Software and Tools	IRI/LDEO Climate Data Library	Massimiliano Pasqui	IBE-CNR
	IRI/LDEO CLIMATE DATA LIBRARY TUTORIAL	Massimiliano Pasqui	IBE-CNR
	GIS and Spatial analysis	Edoardo Fiorillo	IBE-CNR
	INTRODUCTION TO QGIS SOFTWARE	Edoardo Fiorillo	IBE-CNR
	Mapping with QGIS	Maurizio Bacci	IBE-CNR
	Introduction to R	Edmondo Di Giuseppe	IBE-CNR
	Introduction to Climate Data Analysis with R | Part 1	Edmondo Di Giuseppe	IBE-CNR
	Introduction to Climate Data Analysis with R - Part 3	Edmondo Di Giuseppe	IBE-CNR
	Introduction to Climate Data Analysis with R | Part 2	Edmondo Di Giuseppe	IBE-CNR
	Copernicus Climate Change Service	Carlo Buontempo	ECMWF
Climate Modelling Principles	Coupled General Circulation Models	Stefano Materia	ISAC-CNR
	GCM Spatio/temporal resolution suitability for analysis and downscaling techniques	Jost Von Hardenberg	ISAC-CNR
	The GLOBO model: basic highlights	Daniele Mastrangelo and Piero Malguzzi	ISAC-CNR
Climate Risk Reduction Essentials	Climate Services for Disaster Risk Reduction (Intro)	Vieri Tarchiani	IBE-CNR
	WMO and Climate Risk Reduction	Patrick Parrish	WMO
	Climate Risks typology (long and short term)	Marina Baldi	IBE-CNR
	Components of Risk (Hazard - Exposure and vulnerability)	Maurizio Tiepolo	Polythecnic Turin
	Operational products for flood impact assessment and early warning	Lauro Rossi	CIMA Foundation
Drought Management and Forecasting	Drought monitoring and seasonal forecasting	Ramona Magno	IBE-CNR
	Drought Management and Forecasting	Christel Prudhomme	NERC
	Assessment of water balances and optimization based target setting across EU River Basins	Tommaso Moramarco	IRPI-CNR
Introduction to Climate Variability	Climatic Datasets and Projections	Claudio Cassardo	UniTorino
	Integration of observed climate trends with climate projections for the assessment of climate change in the short term	Marco Gaetani	CNRS
	Interactions and physical characteristics of extreme events	Alessandra GIANNINI	IRI
Extreme Events Analysis	Extreme events definitions and tools	Massimiliano Pasqui	IBE-CNR
	Extreme events analysis and their projections	Enrico Scoccimarro	CMCC
	Mesoscale Convective Systems – Dynamics	Samantha Melani	IBE-CNR
	Variability and Change in Weather Extremes: Dynamics - Methods of Analysis and Projections	Michela BIASUTTI	Columbia University
	Analysis of precipitation extreme events with R	Edmondo Di Giuseppe	IBE-CNR
Monitoring Soil moisture	Operational use of in situ and satellite soil moisture observations for improving hydrological applications	Luca Brocca	IRPI-CNR
	Monitoring soil moisture for hydrological applications: remote sensing and in situ techniques	Luca Brocca	IRPI-CNR
	Remote sensing techniques for flood and drought monitoring (+ case study)	Manuela Grippa	GET
Seasonal Forecast Basics	Seasonal predictability and its relation to ENSO	Valentina Pavan	ARPAE
	Sub-seasonal numerical forecasts	Daniele Mastrangelo	ISAC-CNR

For each course a final quiz was prepared, gathering the questions from the trainers. The score of the quiz determines the granting of the badge for the student. Moodle badges have been linked with open badges of Badgr. Users can therefore collect and share digital credentials that validate their skills and accomplishments. Through the platform they can also send signals of success to networks they follow, including LinkedIn, Twitter and Facebook.
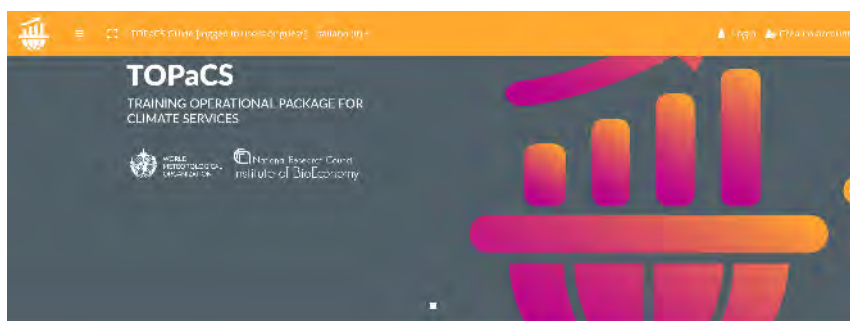
TOPACS is freely available at the url: https://topacs.ibe.cnr.it/

Figure 8, TOPaCS home page

TOPACS was presented and validated in a workshop held in Florence on 4 and 5 December 2020 with the participation of WMO and external observers.

7. Communication

7.1 Project image

A project logo was developed in early May 2017.

Figure 9, Logo of the Project

A Project brochure was developed, illustrating the aim, the activities and the calendar of the planned events. The brochure was printed in French and in English.
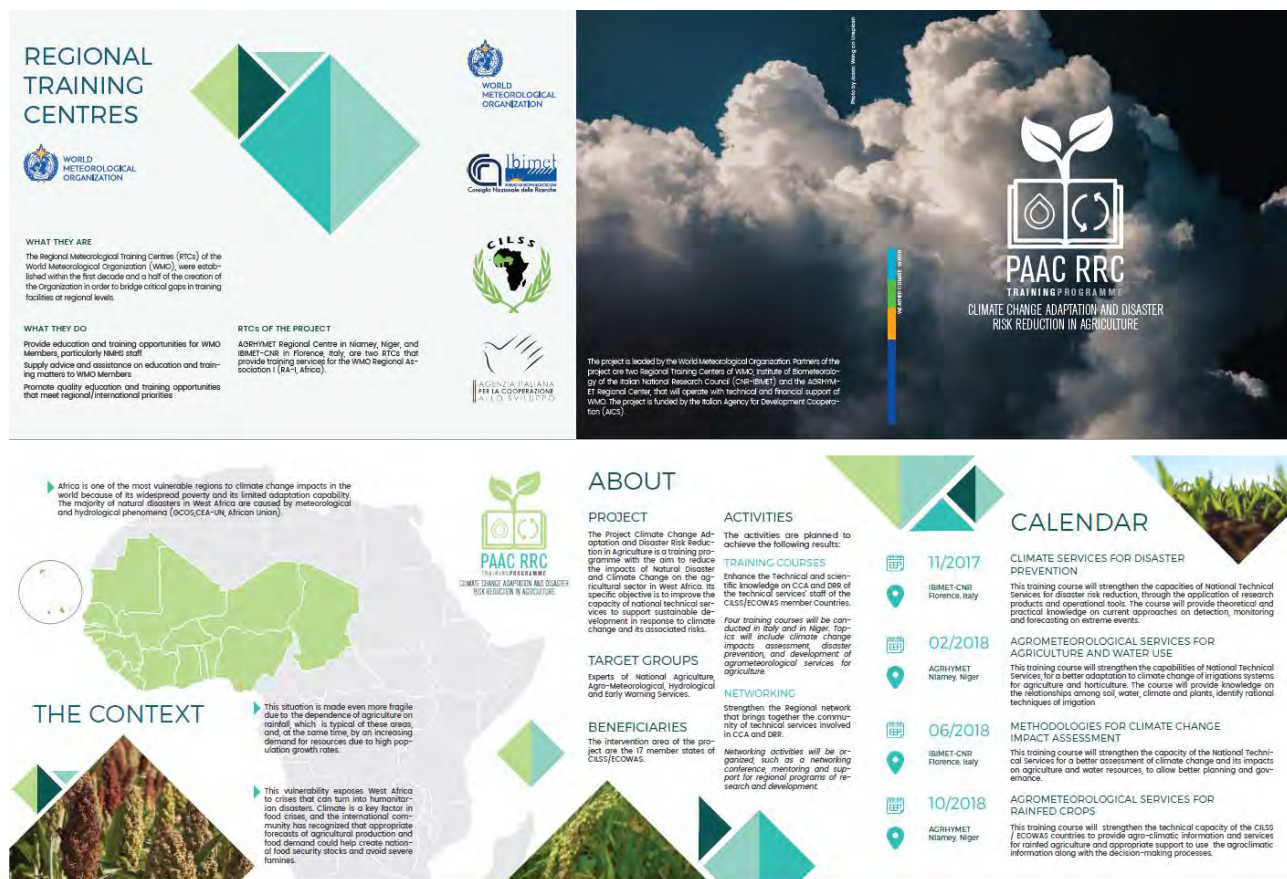
Figure 10, Project brochure

Moreover, a brochure on the four training courses delivered during the project was produced.

Figure 11, The brochure on the training courses

Customized materials for the kits of participants were also prepared for the four training courses and the Networking Conference.

Other communication/training materials were developed, such as a folder, layout for presentations, layouts for documents, posters and so on.

Figure 12, Layout of presentations

7.2 Web page

A web page of PACC-RRC was created on the web portal, Climateservices.it (https://climateservices.it). CLIMATE SERVICES.IT is a hub, which collects the main climate services, tools, and solutions developed by IBE-CNR and LAMMA in accordance with their institutional missions. The aim of CLIMATESERVICES.IT is to share with a wider audience of users the scientific know-how and provide direct access to services, applications, solutions and results of climate research. The portal is also a science communication project. Its aim is to respond to the need for information from users, researchers, business/private companies, citizens and schools through a better usability and accessibility of services. CLIMATESERVICE.IT includes a training initiative for capacity building. In this framework, a dedicated page of PACC-RRC project has been created (https://climateservices.it/progetto/pacc/)
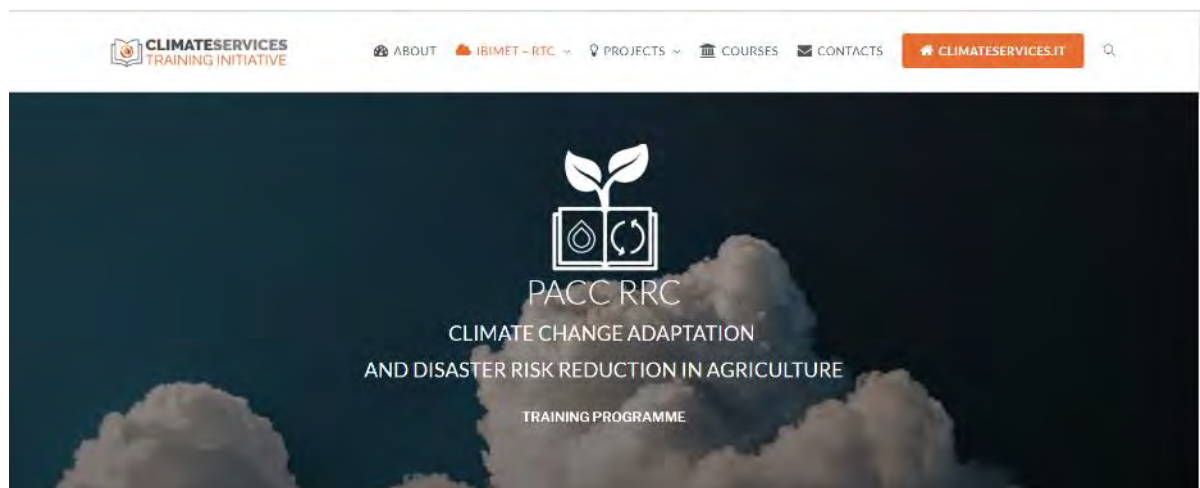
Figure 13, PACC-RRC web page

A project web page was also created on the WMO public website:
(https://public.wmo.int/en/projects/training-programme-climate-change-adaptation-and-disaster-risk-reduction-agriculture)

A web site for the Networking conference has been prepared, available at:
https://eventmanager.mlib.cnr.it/event/40/overview

The web page was used to share with participants materials of the conference as well as the programme and other information.

7.3 Publications

During the project several publications both technical and scientific have been produced and project was presented to several international events. They witness the important achievements the project team obtained in terms of process and results.

Publications

1. [Marina Baldi, Vieri Tarchiani, Elena Rapisardi, Maurizio Bacci, Massimiliano Pasqui, Edmondo Di Giuseppe. Climate change adaptation and disaster risk reduction in agriculture: Lessons learned from an innovative training programme. In Global Campus Innovations. Volume I – New Pedagogical Approaches ETR-27, 2020, Vol I, pp 66-73](#)

2. [Tarchiani, V; Rapisardi, E; Parrish, P; Di Giuseppe, E; Bacci, M; Baldi, M; Pasqui, M, Competencies based innovative learning solutions for co-development of climate services in West Africa, Advances In Science And Research 2020, 17: 47-52](#)

Conferences

1. Meeting of the WMO RCC Coordination Team - 29-30 October 2020, Geneva. Presentation: TOPaCS: from badges to badgr. Earn badges from anywhere. Then take them everywhere. Authors: Marina Baldi, Elena Rapisardi, Vieri Tarchiani

2. Meeting of Directors of WMO RTCs in RA-I and Collaborating Partners (WMO Global Campus Collaboration), Cairo, Egypt, from 28 October to 1 November 2019. Day 2 Examining the current situation, 29 October 2019, Presentation "PACC-RRC: Building an Education Community for Climate Services in West

Africa" Vieri Tarchiani

3. European Meteorological Society Annual Conference 2019, Copenhagen, Denmark, from 9 to 13 September 2019. Session ES1.7 Co-development of weather and climate services in developing and emerging countries. 9 September 2019, Presentation EMS2019-748 "Competencies based innovative learning solutions for co-development of Climate Services in West Africa" Vieri Tarchiani, Elena Rapisardi, Patrick Parrish, Edmondo Di Giuseppe, Maurizio Bacci, Marina Baldi, and Massimiliano Pasqui

4. SYMET – XIII Bridgetown, 31 October 2017. Presentation: "Educational experience toward operational climate services at WMO-RTC Italy" by Marina Baldi

Interview 2018: https://wwww.cnrweb.tv/climate-changeimpacts-assessment-and-communication-cciac/

7.4 Activity on Social Networks

PACC-RRC Project has been on Instagram, Facebook and Twitter since 31 October 2017:

- Facebook: Pacc-Rrc Project
- Instagram: pacc_rrc_project
- Twitter: PACC-RRC PROJECT

The aim of this communication activity is to disseminate and promote outputs and events of the project. We shared with the participants of the e-learning courses all information about social network and we promoted our activity on Social Network during the international training in Florence and in Niamey. The results and number of people involved differed based on social network.

Facebook

Facebook is the most widely used platform around the world to share post, images, events, videos of a product or service. We posted posts with different type of information about the project, the training course and e-learning course.

Community – user name: Pacc-Rrc Project

We posted different types of posts such as photos, status and links. The engagement and the average reached differed (photo below). The screenshot shows that we have more interactions with users through posts with photos.
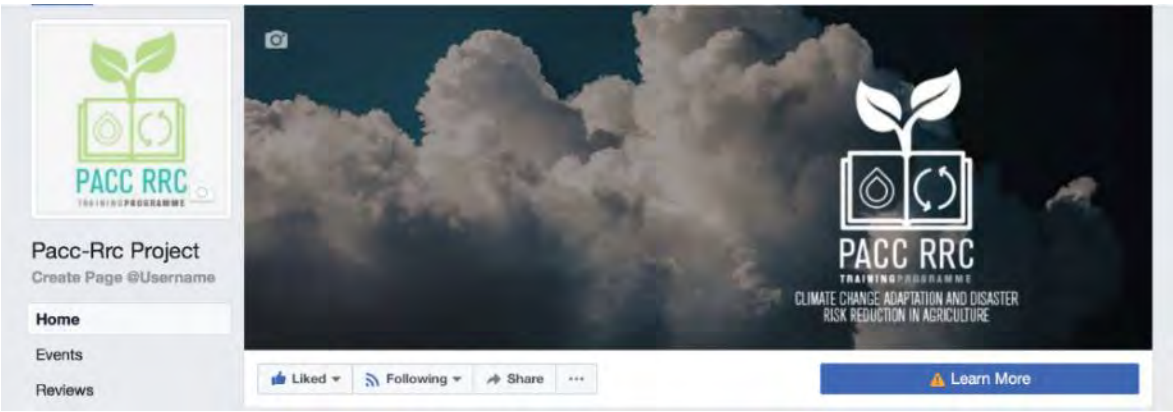
Figure 15, PACC-RRC page on Facebook

Figure 14, Interaction statistics on facebook

In the following screenshots, there are two examples of photos posted on Facebook and the interactions with users.

Figure 16, Examples of photos posted on Facebook

Instagram

Instagram is a Social Network that allows us to share photos without restriction about the number of posts

on a daily basis. We posted more photos with information about the project and the training courses.

User name: pacc_rrc_project

Figure 17, Instagram page of PACC-RRC

In the following screenshots, there are two examples of photos posted on Instagram.

Figure 18, Examples of photos posted on Instagram

Twitter

Twitter is a Social Network that allows us to share posts with photos, links, and documents. The peculiarity of Twitter is related to the ability to post text messages with a maximum length of 140 characters. We posted tweets with information about the project and the training course.

User name: PACC-RRC PROJECT

Figure 19, PACC-RRC page on Twitter

In the following screenshots, there is one example of our re-tweet from the post of 'Ufficio Stampa CNR' about the first training course that was hosted in Florence and the second photo is an example of our posts with information about the third training course.

Figure 20, Example of our re-tweet from the post of 'Ufficio Stampa CNR' about the first training course

The following screenshots includes an example of the activity on Facebook during the first workshop. Many participants actively participated on the social network with photos and status about the training course, as can be seen in the second image (Likes, comments and shares).
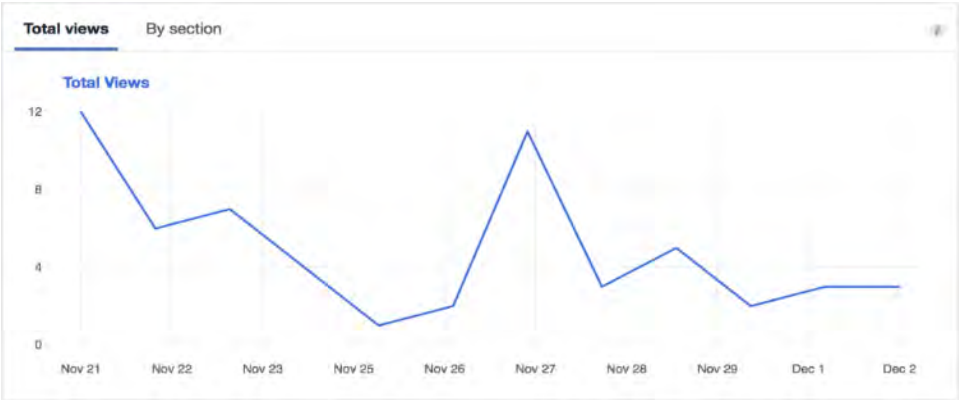
Figure 21, Number of times a Page's profile have been viewed by logged-in people

Figure 22, Number of actions by users per day

In the following screenshot, we can find one example of post on Facebook, Twitter and Instagram during the second training course. During the communication activities, we inserted in each post specific hashtags in order to reach a wider audience.
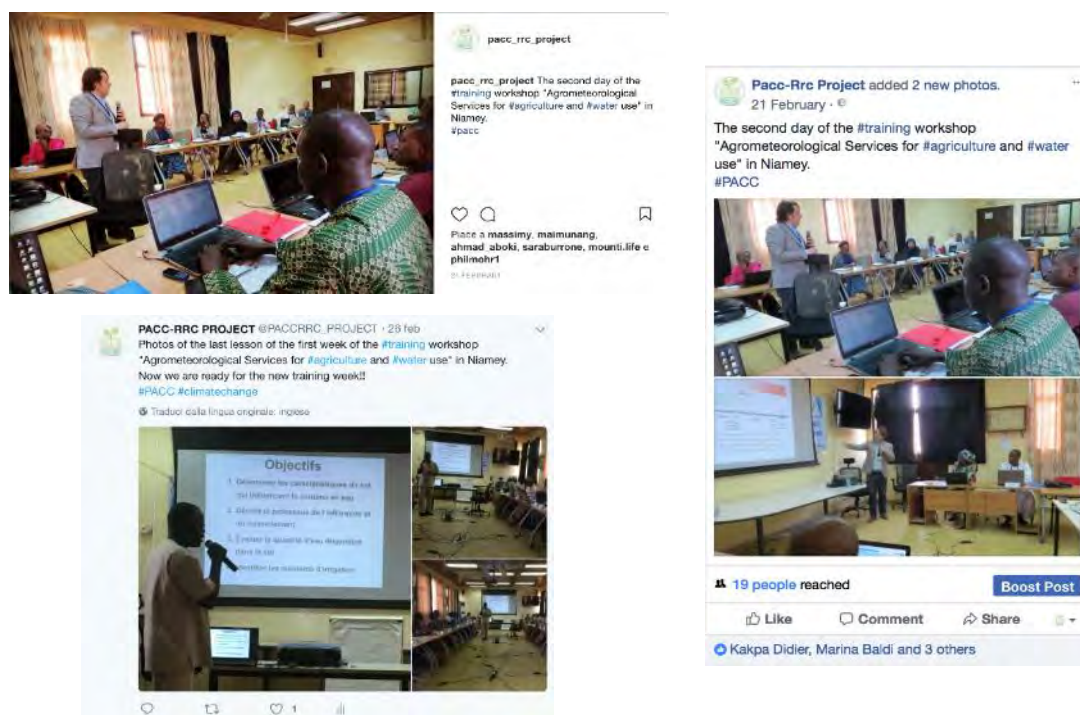
Figure 23, Examples of posts on the different social Medias for the second course

8. Project Management

The project has been led by the World Meteorological Organization, within the Education and Training Programme. A project management team has been established composed by Dr Patrick Parrish (WMO), Dr. Vieri Tarchiani (IBE-CNR) and Dr. Etienne Sarr (AGRHYMET), later substituted by dr. Moussa Waongo.

8.1 Project management activities

The Project management activities include:
- The organization of the Kick-off meeting, held in Geneva on 10 April 2017,
- Letters of Agreement with IBE-CNR and ARC and following amendments
- Payments to IBE-CNR and ARC
- Participation in planning and implementation of project events in Florence and Niamey
- Collaboration in project promotion and design
- Generation of project reports
- Financial management

WMO provided overall project management oversite of the project. This includes tracking the project budget, generating Letters of Agreement for project distribution of financial support, contributions to and final approval of project reports, review and approval of participant selection for each training course, leading the project kick off meeting, contributions to project promotional activities, participation in all project events, identification of some experts, and project tracking via internal WMO project management processes and tools. Coordination of the project activities was performed by IBE, the WMO RTC Italy, and courses were managed by the respective RTCs. The following reports have been produced,

Table 15, Produced reports

Report	Institution	Period	Link
Inception Report	WMO-IBE-CRA	12/04/2017	https://drive.google.com/file/d/1-SXKdWeDjeUtOgtivB_wJaImvrWyTqy8/view?usp=sharing
1 Quarterly Report	IBE	05-08/2017	https://drive.google.com/file/d/14e3J9_kCV4rKyD1HJr9nCo6P4frwAuU4/view?usp=sharing
1 Quarterly Report	CRA	04-07/2017	https://drive.google.com/file/d/1ttQdgT5AA3m7SR47oDVFFFPyi10JfEcF/view?usp=sharing
1 Training Report	IBE	20/11-1/12/2017	https://drive.google.com/file/d/1JzK0qlodEPh8ptwxGcKiftmfQ1ISnwqf/view?usp=sharing
2 Quarterly Report	IBE	09-12/2017	https://drive.google.com/file/d/1F65dddApfMR4JoD1GGTMn1yq8JAOdmJf/view?usp=sharing
2 Quarterly Report	CRA	08-11/2017	https://drive.google.com/file/d/1cB-b8YIwR_rRo4rkSOiOZsnVfdI3fmNK/view?usp=sharing
2 Training report	CRA	19/02-02/03/2018	https://drive.google.com/file/d/16vMtoFIhH8W97gKw2jmc4iV6W9cZc7NL/view?usp=sharing
Annual Report	WMO-IBE-CRA	04/2017-03/2018	https://drive.google.com/file/d/1G4HjCi78tubDGhm3SWUUGatePnmAUnIx/view?usp=sharing
3 Training Report	IBE	25/06-06/07/2018	https://drive.google.com/file/d/1VFgZtjlUE86qLo2k90dqNGjJC0Fbiv1I/view?usp=sharing
4 Quarterly Report	IBE	04-07/2018	https://drive.google.com/file/d/1HnuqRT_TMDKTGIV3xuDEm1l4P9VjGl5-/view?usp=sharing
4 Quarterly Report	CRA	04-07/2018	https://drive.google.com/file/d/1G1vf2-KX-Xm8lnRtl8MaoLYGgHMZiB_7/view?usp=sharing
4 Training Report	CRA	29/10-09/11/2018	https://drive.google.com/file/d/1AjdYihf16S9otTlij-s09-P66FhwLt25/view?usp=sharing
5 Quarterly Report	IBE	08-12/2018	https://drive.google.com/file/d/1___-qLVoXPstMPgLgvGE0zePK4kyryj6/view?usp=sharing
5 Quarterly Report	CRA	08-11/2018	https://drive.google.com/file/d/1pq3NnnMt9jI8VNhBsmqzMZUCXFOzpUMV/view?usp=sharing
Interim Report	WMO-IBE-CRA	04/2017-12/2018	https://drive.google.com/file/d/1W8VynjtqXY8Bf9TmCrRAkxxZ0UTbchJd/view?usp=sharing
Conference Report	IBE	04-05/02/2019	https://drive.google.com/file/d/17iGYO-afhIgRbIy9x9U2AMC8lU_WZS_G/view?usp=sharing
6 Quarterly Report	IBE	01-04/2019	https://drive.google.com/file/d/13Ym21f2WsoVrea-RN7p202wPkgLHO1ky/view?usp=sharing
6 Quarterly Report	CRA	12/2018-02/2019	https://drive.google.com/file/d/1f2lc930RgK1ZnT5psgp7rLqFyzkLJ8rR/view?usp=sharing

7 Quarterly Report	IBE	05-08/2019	https://drive.google.com/file/d/1Ku1HVEbxZsoDReFE0pVD8DzIbrDav2nE/view?usp=sharing
CRA Final Report	CRA	04/2017-02/2019	https://drive.google.com/file/d/1l6XF7PiIZuxQUNNAEkp99NSbyzfBHM7f/view?usp=sharing
5 Training Report	IBE	01/10 to 05/11/2020	https://drive.google.com/file/d/1CA4LTQsbNc2_Df1qsMfgH6gKQkKHld7G/view?usp=sharing
Project Final Report	WMO-IBE-CRA	04/2017-12/2020	

8.2 Collaborations and synergies

A synergy has been established with the project "Adaptation au changement climatique, prévention des catastrophes et développement agricole pour la sécurité alimentaire » Second Phase (ANADIA2), funded by AICS and implemented by IBE-CNR, DMN Niger and the Polytechnic of Turin. ANADIA2 supported three participants from Niger for participating in the first training course in Florence and three for the last one.

AGRHYMET hosted, on 11 October 2017, a joint mission (WMO and World Bank) led by Abdoulaye Harou, Chief of Data Processing and Forecasting Systems at WMO. The discussions focused on the support that the ARC could provide to the Niger institutions as part of a support program that the World Bank provides to Meteorological, Hydrological, Civil Protection and Food Security services in Niger. The mission also informed the ARC of the meeting held in Abidjan from 4 to 8 September 2017, on the "Technical Planning Meeting on the Implementation of the Severe Weather Forecasting Demonstration Project" (SWFDP) in Western Africa. The final report of this meeting was sent to AGRHYMET for further interests.

9. Lessons learnt

9.1 Distance Learning Course (DLC)

With the 1st course held in Florence, we noticed that despite the fact that most participants started the DLC only few completed it. Limitations included:

1. The course was available only 2 weeks
2. The limited time allotted to participants to complete the assignments when at office
3. Poor internet connection.

To overcome these 3 problems, for the second course, we decided the following:

1. Keep open the DLC for 4 weeks, and then we kept it open for 4 more weeks during and after the workshop
2. Ask an explicit commitment of PRs to grant the required 8 hours per week release time to complete the distance learning
3. Structure the DLC in a way that participants could download the educational material and work on it off-line in order to avoid problems related to the internet connection

Nevertheless, less than half of participants completed the DLC even for the further courses.

For the future, we suggest that the DLC and the workshop become two separate but linked courses. Indeed, we could organize the DLC for a larger number of participants and then admit to the workshop only those participants having completed the DLC, better performing or more motivated.

In order to do it, the time needed between the end of the DLC and the beginning of the workshop should be

at least 4-6 months.

Moreover, we should consider defining custom training paths, aimed at acquiring some skills both through e-learning and face-to-face courses. The TOPaCS is a first attempt of a differently structured e-learning platform allowing better management and use of the training resources and materials produced during the different courses, improving the usage of this material in the framework of a new training content strategy. TOPaCS is a package of training modules with specific knowledge/skills linked to the WMO Competency framework for Climate Services Providers. In this way each user, course by course, will achieve a set of skills/knowledge, and the progress in his/her "trainee career" will be clearly shown in his profile. When attending a new training module, the user will be able to "use" the skills/knowledge previously gained. For example, if a module included some skills on R Software, in a following module the user will not be obliged to repeat the lesson on R if he/she can prove to have already gained the background knowledge required.

In this perspective the DLC is not only preparatory to the face-to-face workshop but becomes an independent training path. Competencies acquired through the different modules are acknowledged to participants with a badge linked to an open badge system like Badgr.

9.2 Language

The surveys at the end of the courses done in English and the final conference highlighted a language gap for French speaking participants to interact with English-speaking teachers. The issue was particularly relevant for classroom lectures, while for the practical sessions the presence of French-speaking tutors was demonstrated to be effective. In both courses we tried to provide comments and notes of presentations in French, but it has not been enough because:

1. Trainers often provide their training materials just at the last minute even if solicited well in advance
2. Notes to be read on the Moodle platform distract participants and finally they cannot follow the lecture either on Moodle or live.

Therefore, we foresee two expensive options, and a possible simpler solution:

1. To organize two courses for each topic, one for French speaking and the other for English speaking (Lusophone people allowed to choose one of these). In some cases, we could have difficulties to find trainers that have the same level of French and English, and so could not ensure the same quality for the two courses.
2. To pay a service of simultaneous translation. The costs are very high, and it could be difficult to find translators able to manage the very technical language.
3. To improve the tutoring for French speaking participants, through earlier and better planning of translated materials, or through a redesign of the courses reducing the theoretical lectures and increasing the practical ones for which the tutoring in French proved to be effective.

9.3 Workshop format

Even if the balance of theoretical/practical sessions of last courses was 50:50, participants underlined the need for a more practical training content. Therefore, we are thinking to revise the workshop format. The aim is to reduce the time spent for theoretical lessons and to increase practical/participatory sessions. We propose to transform most of theoretical lessons into webinars to be included in the DLC. During the workshop we would organize just a few lectures/seminars (one hour per day max) and the rest of the time will be spent in practical/participatory sessions. The practical track will drive the whole workshop, while lectures and seminars will integrate it. In this way, we will also reduce the language gap, with appropriate tutoring in both languages for the practical/participatory sessions.

9.4 Web and ICT literacy

We noticed that some participants had limitations in skills to use web applications and ICT in general. Therefore, there is a need to support participants with more detailed instructions on specific criticalities (tests, exercises, use of the Moodle in general and of web applications used during the course).

9.5 Post-course activities monitoring

In the courses we notice that there is a lack of reporting on the post-course activities, including knowledge sharing in their home countries. In order to improve the monitoring of the post-course activities it could be possible to produce a form to help participants in reporting about the various initiatives in the countries. The form must include a short description of the course, the agenda and the list of the participants.

This reporting could help in an overall evaluation of the impact of the course in the countries and the effectiveness of the course deployment.

10. Conclusions

Generally, the overall feedback was positive for all courses. The whole initiative is perceived as an important step to improve knowledge and skills to be more effective in supporting farmers and reduce the impacts of risks.

In terms of outcomes, participants of the five training courses gained theoretical and practical knowledge on current approaches for Climate Services in the fields of Disaster Risk Reduction, irrigation, agrometeorology and climate change including the use of specific tools and software for decision support and communication.

The pedagogical approach of the courses focused on sharing knowledge and promoting exchanges and collaboration to put research products and tools into practice. One of the strengths was the good balance between the practical sessions and theoretical training.

The main constraint was limited internet access, especially during the online course. The participation in the DLC decreased following the different lectures and only part of the trainees completed the online courses. Most of the participants that completed the DLCs evaluated the course format as effective; the others found the main limitations to be the ability to dedicate the required time and limited internet access. The lack of fast and stable internet connections is an issue to be considered, as it is the major cause that could prevent better use of the DLC. In this perspective, some solutions have been implemented for the last courses to have off-line lessons and increase the online tests for verification. (e.g. the students can download a package containing the same content as the online version of the course, except for any audio/video materials and other interactive file types).

The coding of the comments to the questions of questionnaires related to exchanges and knowledge sharing highlight a truly positive outcome of the two courses: the networking. During the courses, participants experienced the networking and sharing with other colleagues, both formally and informally, including the possibility to receive support from colleagues during the learning process.

The project attributed great importance to the sustainability of the training effort. In this sense participants were encouraged to deliver seminars and trainings on the course subjects in their own countries. Moreover, the project set up an online tool TOPaCS aiming to make available the training material developed and collected to a larger audience. In order to improve the usability and create a competency-based distance learning approach, all materials have been reorganized in 11 modules that can be used by trainees within a tailored learning path. TOPaCS offers a solution to deliver courses and distribute learning material on a long-term basis and to an audience wider than direct project beneficiaries, thereby extending the impact of the project, and increasing sustainability.

Annex 1, Logical Framework

Intervention logic	Description	Indicators	Results
General objective	To reduce the impacts of Natural Disaster and Climate Change on agricultural sector in West Africa.		
Specific objective	To improve the capacity of West African governments through their national technical services to support government actions in sustainable development and food security, in response to climate change, natural disasters and their associated risks	Number of represented Countries, Reuse of didactical material, Number of new climate services developed by beneficiary institutions, Number of collaborative proposals developed	17/17 represented Countries, TOPaCS online at https://topacs.ibe.cnr.it/ 2 collaborative project proposals developed
Expected result 1	Technical and scientific knowledge on Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR) of the technical services' staff of the CILSS/ECOWAS Countries is enhanced.	4 training courses, 100 technicians from national technical services trained, positive evaluation of training courses.	5 training courses, 125 technicians from national technical services trained, positive evaluation of training courses.
Expected result 2	The Regional network that brings together the community of technical services involved in CCA and DRR is strengthened thanks to better collaboration and improved technical and scientific cooperation among National HydroMeteorological Services, other technical services and regional and international institutions.	1 conference organized (60 invited) with the participation of high representatives of national technical services of CILSS/CEDEAO Countries, Regional Training Centers, Regional/international organizations, future training needs are assessed, distance-learning tools are online, number of access to online services, didactical activities organized in the countries.	1 Conference with 70 participants, statement on future training needs, TOPaCS online with 11 training modules, didactical activities organized in 11 countries, 2 web pages online, pages on 3 different social media

Annex 2, Detailed Chronogram

		2017									2018												2019												2020											
	Activity / Month	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
0.1	Project management and Kick-off meeting	X																																												
0.2	Project reports	P				Q				Q				A				Q				A	Q					Q			Q																F
0.3	Identify connections with relevant region projects	X																																												
0.4	LOAs in place	-	-	X		X																																								
1	**Expected result 1**	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1.1	*Training Course on Climate services for disaster prevention (extreme events) - Italy*																																													
1.1.1	Selection criteria		X																																											
1.1.2	Course information		X																																											
1.1.3	Announcement		X																																											
1.1.4	Identify lecturers			X																																										
1.1.5	Select participants				X																																									
1.1.6	Course materials								X																																					
1.1.7	Event								X																																					
1.1.8	Activity report									X	X																																			

Project Reports (I=Inception report; Q=Quarterly Report; A=Annual Report; F=Final Report)

Training Program on Climate Change Adaptation and Disaster Risk Reduction in Agriculture (PACC/RRC)

		2017									2018												2019												2020											
		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1	**Expected result 1**																																													
1.2	*Training Course on Agrometeorological Services for agriculture and water use (irrigation and horticulture) - Niger*																																													
1.2.1	Selection criteria					X																																								
1.2.2	Course information							X																																						
1.2.3	Announcement								X																																					
1.2.4	Identify lecturers									X																																				
1.2.5	Select participants									X																																				
1.2.6	Course materials									X																																				
1.2.7	Event											X																																		
1.2.8	Activity report												X																																	
1.3	*Training Course on Methodologies for Climate Change impact assessment - Italy*																																													
1.3.1	Selection criteria									X																																				
1.3.2	Course information									X	X																																			
1.3.3	Announcement									X		X																																		
1.3.4	Identify lecturers										X	X																																		
1.3.5	Select participants											X	X																																	
1.3.6	Course materials															X																														
1.3.7	Event															X	X																													
1.3.8	Activity report																	X																												

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PACC/RRC Final Report

Training Program on Climate Change Adaptation and Disaster Risk Reduction in Agriculture (PACC/RRC)

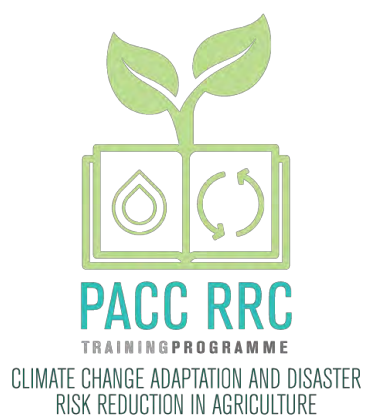| | | 2017 | | | | | | | | | 2018 | | | | | | | | | | | | 2019 | | | | | | | | | | | | 2020 | | | | | | | | | | | |
---	---	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1	**Expected result 1**																																													
1.4	*Training Course on Agrometeorological Services for rainfed crops - Niger*																																													
1.4.1	Selection criteria																X																													
1.4.2	Course information																	X																												
1.4.3	Announcement																	X																												
1.4.4	Identify lecturers																	X																												
1.4.5	Select participants																		X																											
1.4.6	Course materials																			X																										
1.4.7	Event																			X	X																									
1.4.8	Activity report																					X																								
1.5	*Training Course on Climate and Risk Communication*																																													
1.5.1	Selection criteria																														X														
1.5.2	Course information																														X														
1.5.3	Announcement																															X													
1.5.4	Identify lecturers																																X												
1.5.5	Select participants																																X												
1.5.6	Course materials																																X	X	X										
1.5.7	Event																								Postponed COVID-19															X	X		
1.5.8	Activity report																																										X		

Training Program on Climate Change Adaptation and Disaster Risk Reduction in Agriculture (PACC/RRC)

		2017									2018												2019												2020											
2	**Expected result 2**	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
2.1	*Networking Conference*																																													
2.1.1	Prepare Conference																		X																											
2.1.2	Announcement																				X																									
2.1.3	Define programme																				X	X																								
2.1.4	Conference materials																			X	X	X																								
2.1.5	Event																								X																					
2.1.6	Activity report																									X																				
2.2	*Mentoring and support*																																													
2.3	*TOPaCS*																																													
2.2.1	Design of the ToPacCs																									X	X																			
2.2.2	Setup and customization of the Moodle platform																									X	X	X																		
2.2.3	Contents production																										X	X	X	X	X															
2.2.4	Test and Debugging																													X	X	X		X												
2.2.5	TopPacCs publishing on the Moodle Platform																															X	X													