



Training Program on Climate Change Adaptation and Disaster Risk Reduction in Agriculture



Initial Report

Operational Programme

12 April 2017



Partnership	WMO (World Meteorological Organization), IBIMET-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	20 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 World Meteorological Organization, IBIMET–CNR and AGRHYMET Regional Centre have been collaborating since the '70s to support National HydroMeteorological Services in the transfer of technological innovations.

The Institute of Biometeorology (IBIMET) was created within the National Research Council (CNR) in the late 70's in Florence, having as its mission the application of meteorology and remote sensing in agriculture and environment. Founded in 1974, AGRHYMET is a specialized institution of the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS) and the Economic Community of West African States (ECOWAS), which has as its mandate to inform and train on food security, the fight against desertification and water management in the Sahel and West Africa.

AGRHYMET and IBIMET-CNR are two WMO Regional Training Centers offering training and technical assistance to West African countries.

In 2015, WMO, IBIMET-CNR and AGRHYMET decided to propose a Regional Training Programme to support CILSS/ECOWAS countries on Climate Change Adaptation and Disaster Risk Reduction in Agriculture.

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

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.

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 organised 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 IBIMET-CNR, Dr Antonio Raschi and Dr Moussa Waongo from AGRHYMET.

The results of the Kickoff meeting are condensed in this report.

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

This 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 project is being led by the World Meteorological Organization. Partners of the project will be two WMO Regional Training Centers, the Institute of Biometeorology of the Italian National Research Council (CNR-IBIMET) and the AGRHYMET Regional Centre, which will operate with technical and financial support of WMO.

WMO will be 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 will coordinate and assist the other actors in the project outreach and communication activities. WMO will ensure direct communication and coordination with the Italian Permanent Mission in Geneva, through which all official communication and reporting will be transmitted. The WMO will participate in the technical activities by providing guidelines for the training methodology and its content experts will be involved in the training activities and planned events.

IBIMET-CNR will ensure the technical coordination of the activities. In agreement with the other actors, IBIMET will take part in the definition of the training methodology and will realize two training courses in Italy and also will participate in all courses organized by AGRHYMET. IBIMET will also organize the Networking Conference in Italy. IBIMET will co-sponsor the initiative by providing its own permanent personnel and infrastructure. IBIMET will ensure technical coordination with AICS (Italian Agency for Development Cooperation) in Rome for the Networking Conference.

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

The project partners will seek collaboration with other technical and scientific partners in the region as well with international initiatives (i.a. PIREM) and projects dealing with climate change adaptation and disaster risk reduction. Third parties will be involved in training activities as required to meet specific training objectives. Synergies will be established with regional projects of WMO (METAGRI SERVICES, CREWS), ECOWAS (ECOAGRIS), EU (MESA), USAID and African Development Bank.

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

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 CCA and DRR. The recipients will improve their skills through training courses and enhance their networking capacity through the project follow-up and post-course activities.

Ministries and Institutions to which participants belong will 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.

4. Methodological approach

The strategic approach of the project is to consolidate and innovate the existing sub-regional networks among national, regional and international institutions. The national networks are based on so-called multidisciplinary working groups (GTPs) made up of members of the NHMSs, the Ministry of Agriculture, and other sectoral ministries. One of the most important roles of the groups is to act as a unifying element for bridging the gap between the "climate world" and the agricultural community and to 'translate' climate information into useful input and advice for farmers. Regionally, AGRHYMET is the hub of the network of Meteorological Services and GTPs, providing training and information. Many technicians and experts of NHMSs have been in fact educated and trained by AGRHYMET. The existing network, however, shows a number of weaknesses, including an inadequacy of traditional systems of communication and exchange of information and experience among the various actors. In addition, previous cooperative initiatives among the countries of the region have shown the limits of the networks traditionally focused on specific aspects, such as food security, and the need to explore other ways of exchanging information, methodologies and tools for the analysis and monitoring of climate and its impacts on a regional scale.

To renew and streamline both networks and exchange mechanisms a greater openness and cooperation between international scientific and technical institutions is needed. This can be done either through training activities that bring together the various actors involved on a specific issue, and through the mechanisms of continuous exchange, including those offered today by new ICT technologies. The collaboration between the two RTCs, AGRHYMET and IBIMET, is one example. To guarantee a consistency of training approach and more effective collaboration, experts from AGRHYMET, IBIMET, and WMO will participate as trainers in all the project activities.

In this context, the strategy of PACC / RRC is 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 is 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 shared mechanism of knowledge management. The aim is 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 will be an open access platform for knowledge and training resources management, ICT solutions for networking and distance support and finally a networking event.

4.1 Training approach

The training objectives require a multidisciplinary approach to ensure the understanding of climate impacts on natural resources, agricultural production and the socio-economical context. Therefore, the training sessions will focus on the topic from different points of view to create and consolidate a base for the exchange and multidisciplinary understanding among the different stakeholders. Knowledge enhancement will occur through training courses that include 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 is necessary for the realization of an interregional partnership among technicians and scientists.

A blended solution of distance learning and classroom workshops will be adopted for the courses.

Distance learning will be 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.

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

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

Trainers will be provided with guidelines for developing their training materials, and layout of presentations. Trainers will be asked to provide well in advance before the workshop the training resources including presentation with summary and annotations that will be translated as fully as possible to allow bilingual participation. Training resources will be made available with open access after the core training events, as well as shared via the WMO Global Campus for other users. For more details see chapter 5.3.

Follow-on activities are also proposed, interlinked with the networking component. All participants will be asked to share the knowledge gained within their home institutions, and this sharing via local courses or mentoring will be reported to the project team and other participants. (See section 5.4 of this report.)

Ongoing mentoring is considered a critical part of the training approach to ensure the long term impacts of the project. The mentoring programme of activities will be developed by the project partners, and will include activities such as connecting participants to appropriate mentors for ongoing support, establishing an interdisciplinary community of practice of participants, establishing a networking site for sharing experiences, tools and strategies and for asking advice (utilizing the distance learning platform, for example), developing a repository for knowledge management of regional stakeholders. The WMO Global Campus tools and activities will play a role in the mentoring activities. For more details, see section 5.3.2 of this report.

4.2 Trainee selection

The sustainability of the training program is 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 are designed for actors with different levels of experience and disciplines. For this reason, the planning of the courses requires 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 will be 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 is to engage all institution partners, PRs will be asked for up to 3 nominations, of which no more than 2 should be from the national meteorological and hydrological service. Participants selection will be made by the three project partners, with the goal to broaden national and institutional engagement. PRs will be sensitized for ensuring gender diversity.

At least 17 participants will be selected among nominations from PRs of member countries. The selection will be 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 do not propose participants, additional places will be allocated to the other target countries. Preliminary selection will be done by an internal committee of the organizing partner. Once this ranking is established, it will be shared for advice with WMO and the third partner.

Up to 8 further participants will be invited to each course, based on partners consensual decision, coming from national, regional or international technical or research organisations of the target countries.

Moreover, up to 5 further participants can be accepted to participate to courses with funding from other sources outside the project.

The maximum number of participants is therefore 30 per training course.

5. Program of activities

The proposed Training Program will last up to 20 months. This time frame will allow the project to complete a process of strengthening skills at the regional scale and involving the countries and regional and international institutions in a coherent network. The project will help to revitalize the regional role of AGRHYMET and accelerate the process of implementing climate services in CILSS/ECOWAS region. The project will establish a knowledge base and a community of experts to be promoters of climate services implementation in the region.

The activities are planned to achieve the following 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.
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.

To achieve the first result, four high-formation training programs, lasting two weeks, will be organized: 2 by the AGRHYMET Regional Centre and 2 by IBIMET-CNR. One hundred experts from national line ministries and other regional institutions/initiatives will be trained.

The main milestones will be courses on:

- Climate services for disaster prevention (IBIMET-CNR, November 2017),
- Methodologies for Climate Change impact assessment (IBIMET-CNR, June 2018),
- Agrometeorological Services for agriculture and water use (AGRHYMET, February 2018),
- Agrometeorological Services for rainfed crops (AGRHYMET, October 2018).

To achieve the second result, the activities will be:

- Networking Conference (November 2018),
- Mentoring and support for trainees and outreach activities.

The general timetable is presented below while the detailed program of activities is reported in chapter 8.

5.1 Time table and Milestones

Activity / Month	2017										2018											
	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		F	
Expected result 1																						
1.1 Training Course on Climate services for disaster prevention (extreme events) - Italy								X														
1.2 Training Course on Methodologies for Climate Change impact assessment - Italy															X							
1.3 Training Course on Agrometeorological Services for agriculture and water use (irrigation and horticulture) -Niger											X											
1.4 Training Course on Agrometeorological Services for rainfed crops - Niger																			X			
Expected result 2																						
2.1 Networking Conference - Italy																				X		
2.2 Mentoring and support																						

Events = X

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

5.2 Training activities

5.2.1 Distance learning

For each of the courses, a distance learning platform will be used both for distance learning and for monitoring trainees after the workshop. Distance learning will be used for conducting pre-workshop activities that help to bring all participants to the same level before the presential workshop. These will build essential background knowledge and skills to use the tools that will be applied during the workshop. It will also begin to build community and create engagement in the project in the early stages of participant involvement. The use of a distance learning platform will also facilitate the sharing of course materials during and after the course, and to staff members of target countries who cannot attend the courses. This can help for review purposes and for dissemination in local training. The distance learning platform also offers the potential to facilitate assess of the longer term impacts of the project through ongoing interactions, contributing to mentoring activities. These new applications of distance learning will help to develop the capabilities of the regional training centers.

To encourage full participation on both phases, completion of the distance learning portion earns a separate certificate to the one issued for completion of the presential course.

Course resources will be translated as fully as possible to allow bilingual participation. Lecturers will be asked to develop annotations to all of their presentation materials to allow those with limited English skills to follow in French, and to allow reuse of lecture materials in local training after the core training events, as well as for sharing via the WMO Global Campus for other users. Project partners are actively searching for complementary resources to completely translate the materials of each course such that they are available in both English and French. Lecturers will be asked to make their material available to the broader community, and avoid copyright violations that would prevent sharing. To maintain a level of ownership, open source licenses that allow adaptation yet require attribution, such as Creative Commons, will be encouraged. A list of contributors will be created and made available as well to ensure their visibility.

The training program includes 4 training courses with workshops of two weeks each. A distance learning component will precede and follow each workshop, and follow-on activities will be encouraged.

5.2.2 Climate Services for disaster prevention (IBIMET-CNR)

The objective of this training course is to strengthen the capacities of National Technical Services for disaster risk reduction, through the application of research products and operational tools. The course will be realized in Italy and addressed to the experts of the National Meteorological Services and technicians involved in operational platforms for crisis and disasters management. The workshop component lasts two weeks and will be organized by CNR-IBIMET within the cooperation of the WMO (Regional Training Centre). Topics will include:

1. Climate Services for Disaster Risk Reduction (day 1)
 - a. Risk typology (long and short term),
 - b. Component of the DRR (Alert, Management, Rehabilitation, Prevention);
 - c. Components of Risk (Hazard, Exposure, Vulnerability)
2. Climatic analysis of Extreme events (day 2-5)
 - a. Geo-statistical analysis of extreme events
 - b. Climate Extremes Indices (CLIMDEX)
 - c. Extreme events trends
 - d. Mapping of extremes
3. Detection, monitoring and forecasting deep convective systems and supercells (day 6-8)
 - a. Characteristics and Dynamics
 - b. Numerical weather forecasts of extremes
 - c. Dust storms

- d. Hydrological applications
- e. Operational products for early warning
4. Detection, monitoring and forecasting Dry Spells, (day 9-10)
 - a. Rainfall
 - b. Soil moisture
 - c. Vegetation
 - d. Mapping Extremes
5. Practical exercitation (afternoons)
 - a. Geo-statistical analysis with R and R ClimDex (days 1-5)
 - b. Spatial analysis and mapping with QGIS (days 6-9)

A visit to the Osservatorio Ximeniano in Florence will be organized during the course.

The beneficiaries will be 25 national experts of the NMSs and institutions participating in the national platforms of disaster management and prevention in the CILSS / ECOWAS countries.

The trainers will be:

- teachers and researchers from universities and research centers: CNR, Politecnico di Torino, University of Florence, EuroMediterranean Centre for Climate Change, LaMMA Tuscany Region
- teachers and researchers from foreign research centers: METEOFRACTANCE, CNRS
- WMO and AGRHYMET experts.

The program will consist of lectures and practical exercises, taking a 50-50 sharing of the training time. The training will be held at the Research Area of CNR in Sesto Fiorentino (FI).

The scientific coordinator of the course will be Dr. Massimiliano Pasqui (IBIMET-CNR).

Students and teachers of the course will benefit from a Moodle platform through which educational material will be shared and assessment procedures ensured.

5.2.3 Methodologies for Climate Change impact assessment (IBIMET-CNR)

The objective of this training course is to strengthen the capacity of the National Technical Services for a better assessment of climate change and its impacts on agriculture and water resources, to allow better planning and governance through the implementation of research products and operational tools. The course will be realized in Italy and addressed to the experts of the National Technical Services, in particular Agriculture and Agrometeorological services. The workshop component lasts two weeks and will be organized by CNR-IBIMET within the cooperation of the WMO (Regional Training Centre). Topics will include:

- Climatic Datasets and projections: availability, differences and limitations for agro-climatic analysis, (day 1)
- Spatial/temporal resolution, suitability for analysis and downscaling (day 2)
- Integration of observed climate trends with climate projections for the assessment of climate change in the short term, (day 3)
- Trends and projections Extreme events (day 4)
- Methods and tools for climate analysis in relation to crop production systems (day 5)
- Modeling and assessment of the impacts of climate change on crops and water availability, (day 6-7)
- Economics of climate change impacts (day 8-9)
- Agro-meteorological and agronomic strategies for the adaptation of production systems (day 10)
- Practical exercises during the afternoons: Access, download and treatment of climatic data from open-access web-databases, use of R environment for geostatistical analysis

The beneficiaries will be 25 national experts from the agriculture and agro-meteorology services of the CILSS / ECOWAS countries.

The trainers will be:

- teachers and researchers from Italian universities and research centers: University of Florence, University of Sassari, EuroMediterranean Centre for Climate Change
- teachers and researchers from foreign research centers: IRI, CNRS, University of Leeds
- WMO and AGRHYMET experts.

The program will consist of lectures and practical exercises, taking a 50-50 sharing of the training time. The training will be held at the Research Area of CNR in Sesto Fiorentino (FI).

The scientific coordinator of the course will be Dr. Massimiliano Pasqui (IBIMET-CNR)

Students and teachers of the course will benefit from a Moodle platform through which pedagogic material will be shared and assessment procedures ensured.

5.2.4 Agrometeorological Services for irrigation and horticulture (AGRHYMET)

The workshop, lasting two weeks, will be realized in Niger by the AGRHYMET Regional Centre and it will address to the experts of the National Technical Services, in particular to technicians from agro-hydro-meteorological service. This training course will be organized within the cooperation of the WMO (Regional Training Centre).

The activities will be divided into 2 parts:

The aim of the first part is to (i) provide basic knowledge on the relationships among soil, water, climate and plants, (ii) identify rational techniques of irrigation, (sprinkling methods, performance of materials for irrigation, fertigation).

The second part of the course will be focused on the adaptation of irrigations systems to climate change for agriculture and horticulture. The course will provide (i) tools for the identification of climate risks for irrigated crops, impacts and adaptive capacity of communities, (ii) methodologies (risk matrices, multi-criteria analysis) to identify adaptation strategies in agriculture and (iii) the presentation of innovations to face climate change.

The beneficiaries will be 25 national experts of agro-hydro-meteorological services of the countries of the CILSS / ECOWAS.

The trainers will be:

- teachers and researchers of the AGRHYMET Regional Centre.
- teachers and researchers from foreign research centers
- WMO and IBIMET-CNR experts.

The program will consist of lectures and practical exercises, taking a 50-50 sharing of the training time. The training will be held at the Regional Center AGRHYMET of Niamey, Niger.

The scientific coordinator of the course will be Dr. Moussa WAONGO (AGRHYMET).

Students and teachers of the course will benefit from a Moodle platform through which pedagogic material will be shared and assessment procedures ensured.

5.2.5 Agrometeorological Services for rainfed crops (AGRHYMET)

The objective of this training course is to strengthen the technical capacity of the CILSS / ECOWAS countries to produce agro-climatic information and services for rainfed agriculture and provide appropriate support to use that agroclimatic information along with the decision-making processes. The course will be realized in Niger by the AGRHYMET Regional Centre and it will address to the executives of the National Technical Services, in particular to technicians from agricultural and agro-meteorological services. This training course will be organized within the cooperation of the WMO (Regional Training Centre).

Topics will include:

- Climatic risk in agriculture,
- Assessment of food uncertainty per area and household,
- Products and weather alerts for users,
- Adaptation strategies to climate variability and change,
- Tools for Climate Risk: indexed agricultural insurance systems.

The beneficiaries will be 25 national experts from agro-meteorological services of the CILSS / ECOWAS countries.

The trainers will be:

- teachers and researchers of the AGRHYMET Regional Centre.
- teachers and researchers from foreign research centers
- WMO and IBIMET-CNR experts.

The program of the workshop will consist of lectures and practical exercises, taking a 50-50 sharing of the training time. The training will be held at the Regional Center AGRHYMET of Niamey, Niger.

The scientific coordinator of the course will be Dr. Seydou TRAORE (AGRHYMET).

Students and teachers of the course will benefit from a Moodle platform through which pedagogic material will be shared and assessment procedures ensured.

5.3 Description of the ‘Networking’ activities

The project aims to enhance the networking of the technical services’ community involved in the CCA and DRR to increase collaboration and strengthen the technical and scientific cooperation among the Hydrometeorological Services, the National Technical Services and other regional and international institutions.

5.3.1 Final Conference

After the four training courses a final conference will be organized in Rome, Italy. The conference will gather high-level responsables of the Ministries to which the NMHSs belong and the Directors of Meteorological Services of the Region. The conference will further promote the strategic collaboration of involved countries with WMO and Italy. The aim of this conference is to enhance technical and scientific cooperation among National Meteorological Services, in the perspective of providing operational climatic services for disaster risk reduction and adaptation to climate change in agriculture.

During the conference, an evaluation of the training program will be conducted and indications on needs for future training activities on climate services will be collected.

5.3.2 Mentoring, monitoring and support for regional programs of research and development

This activity will begin with the selection of participants to the training courses which will be supported by different means in the exchange of experiences and interests. The aim of this activity will be the development of partnerships to propose future programs of research/development and study exchanges.

Project partners will make available their respective Moodle platforms to the project to develop specific pages for each course. The Moodle pages will be used to:

- 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 issues and practical exercises covered by the course;

- assessment of students and courses through the online questionnaires;
- sharing of multimedia material produced during the course;
- monitoring and evaluating trainees after the course.

A common web page will be developed to provide access to project documentation and learning materials. Indeed, project partners will extend and leverage the workshops through continued contact with the participants to ensure that they are able to use the knowledge and skills developed during the workshops when they return to the workplace. We will use a variety of means, all remote, for the follow-up. Some will be via partners' Moodle servers, some via one-on-one discussion using the internet or phone connections as well as email.

The idea is to focus not only on contents but also on communication options among users, by creating a community of users and practitioners. Users will be asked to contribute to further improve the learning modules uploading and sharing further learning materials, documents, applications and publications. It is necessary to consider the platform not as a static environment but as a constantly improving tool. In this way, it will be possible to guarantee long-term sustainability of the system and continual improvements.

Thus, a space for exchange of information, support requests and contents insertion by the users will be developed within the Moodle platform or a separated public web page.

Training materials will be made available for further use by trainees and their respective institutions but also to other institutions. Materials will be credited to authors and made free for use and adaptation through a Creative Common license wherever possible.

Training material should also contribute to WMO Global Campus platforms.

5.4. Monitoring and Evaluation

The training courses will be subjected to an effectiveness evaluation on the basis of Kirkpatrick¹ evaluation model, at the first three levels: Reaction, Learning and Transfer. Therefore, activities will be evaluated at multiple levels:

- The response to each activity will be evaluated for the initial opinions of participants on the relevance, effectiveness, engagement, and impact of the intervention. This feedback will be gathered via surveys.
- Learners will be 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 will be evaluated through practical exercises and quizzes covering essential course content.
- Long term impacts will be measured by assessing how learning impacts practice within the participant's organization. This will also provide information on how future interventions might be improved, or how follow-on project activities can be improved.

Participants will be awarded with badges for incremental competency development and certificates for completion of online, presential, and follow-on activities.

Post-workshop activities required by participants will be:

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 will be presented at the final conference. Poster will also be evaluated and will ensure a badge.

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

2. Sharing the course content in the participant's local institution. This will be evaluated based on evidence documented in multiple formats.
3. An award will be granted to the participant that best performed in each training course, including the follow-on activities, on the basis of the acquired badges and a qualitative assessment. The 4 winners, one for each course, will be invited to the final conference in Rome, to present with a speech their poster and training experience.

All courses, no matter the organizing institution, will offer common certificates and badges based on common evaluation practices. After each course a report will be prepared by the organizing partner. The report should summarize the course contents, participation and evaluation.

The whole project evaluation will be done on the basis of logical framework indicators. Moreover, PACC-RRC incremental advantage (added value) will be assessed against the baseline of ongoing activities in the region and existing projects on the ground. Indicators that could be used for this purpose are:

- Indications of networking activities, use of the platform, anecdotal evidence, survey responses
- Evidence of post-course application and dissemination
- Synergies with other initiatives
- Evidence of service enhancements and service improvements
- Uploads of examples of code enhancements, information sharing, papers, reports, etc. for community sharing
- Usage of course resources afterwards

5.5 Project management

The project will be coordinated by a Senior WMO Expert in collaboration with a Senior Researcher at AGRHYMET and Senior Researcher of IBIMET-CNR. At the beginning of the project, a kick-off meeting to revise and finalize the program of activities and define the logistics of the training courses was organized in Geneva on April 10-11 2017. During this meeting, the methodology and the operational procedures for the implementation of the courses were decided. After the kick-off, the first project report will be issued. This report of the kick-off meeting outcomes comprises the first project report.

Three levels of reporting will be ensured during the project:

1. Activities reports (reports of meetings, training events, conference, etc.)
2. Internal quarterly reports
3. Annual and Final reports for the donor

A quarterly report will be prepared by partners and sent to WMO each 4 months period starting in August 2017.

The final report will be produced within 2 months after the end of the project.

The Project Activity Report Template for Courses will include:

- Goals
- Objectives/Outcomes
- Description
- Participants
- Evaluation results
- Distance learning activities

- Workshop
- Post-course
- Programme of events
- Achievements
- Problems
- Recommendations
- Follow up activities
- Photos of event

5.6 Outreach and communication

The visibility of the project will be ensured by communication activities, carried out in conjunction with courses such as photo shoots, interviews with students and professors and video production on the conduct of training activities and practices. This material will be mounted in a professional manner, made available to the project partners and the AICS.

Main communication tools will be:

- Publicity of each event on websites and other platforms
- Communication with local officials
- Press release from IBIMET/AGRHYMET/WMO
- Press release of project kick-off from WMO (to be sent to project partners)
- Announcements before each project event
- Communication on the outcomes of each event (Websites, Social Media, WMO media, WMO documents, Global Campus, Annual Reports, Project Website under ETR, WMO Project site, WMO Agmet Office, focal points)

6. Budget

The total cost of the Project is € 822,843.27. The budget is hereafter presented for the project and the extension separately.

Project:

- The chapter "Personnel" includes the costs for the staff of the WMO and its partners for a total of € 157,637 (20% of direct costs).
- The chapter "Missions and travel" includes travels and missions of the WMO and its partners and of trainees for a total cost of € 209,760 (27% of direct costs).
- The chapter "Equipment, materials and supplies" includes teaching equipment for classrooms and for experimentation and computer materials, for a total of € 13,482.44 (2% of direct costs).
- The chapter "Training and Seminars" includes costs for the organization of training course and seminars, the costs of participation of the trainees, including travel, study visits and costs for external trainers. The total is € 309,512 (41% of direct costs).
- The chapter "Other costs" includes the cost for operation, communication and dissemination of the results, including the development of distance learning and monitoring tools and the costs for

reporting and monitoring for a total of € 71,500 (10% of direct costs).

- General and administrative costs are calculated as a flat rate of 8% of total direct costs.

Budget of the project

	Description	Unit	Q.ty	U. cost Euro	Total Euro
1	Personnel				157 637.47
1.1	IBIMET	m/m	12	8 043.75	95 184.35
1.2	AGRHYMET	m/m	10	4 468.75	42 453.13
1.3	WMO	m/m	2	10 000.00	20 000.00
2	Travels, Missions				209 760.00
2.1	Travels intercontinental	n°	108	1 235.19	133 400.00
2.2	Travels continental Africa	n°	42	950.00	39 900.00
2.3	Travels continental Europe	n°	14	600.00	8 400.00
2.4	Travels national	n°	24	166.67	4 000.00
2.5	Perdiems international Italy	day	40	153.00	6 120.00
2.6	Perdiems international Niger	day	30	140.00	4 200.00
2.7	Perdiems Switzerland	day	22	208.00	5 500.00
2.8	Perdiems WMO Italy	day	20	230.00	4 600.00
2.9	Perdiems WMO Niger	day	20	182.00	3 640.00
3	Equipements and materials				13 482.44
3.2	Didactical equipments	forfait			5 000.00
3.3	Miscellaneous	forfait	-	-	8 482.44
4	Trainings and Conference				309 512.00
4.1	Invited Trainers	day	82	207.90	17 048.00
4.2	Organization Trainings and Conference	n°	5	15 446.00	77 230.00
4.3	Participants	day	1 860	115.73	215 234.00
5	Other costs				71 500.00
5.1	Running costs	month	12	1 000.00	12 000.00
5.2	Communication	forfait	-	-	5 500.00
5.3	Distance learning and monitoring tools	n°	3	5 000.00	14 000.00
5.4	Reporting and monitoring	n°	6	6 666.67	40 000.00
	Total direct costs				761 891.91
	Overheads				60 951.35
	TOTAL				822 843.27

7. Logical Framework

Intervention logic	Description	Indicators	Source of verification	Assumptions
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	Technical services, media and civil society, project reports, presented projects, web sites of national technical services involved.	Participation of interested actors, project partners, socio-political stability.
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.	Activity reports, training reports, project reports.	Participation of interested actors, project partners, socio-political stability.
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.	Activity reports, seminar reports, web sites, media, specialized networks.	Participation of interested actors, project partners, security.

Intervention logic	Description	Means	Costs (€)	Assumptions
0.1 Project management and Kick-off meeting	This activity includes project management, planning and design, communication, reports writing and financial reporting.	WMO, IBIMET and AGRHYMET staff, missions, running costs	208 147	Participation of stakeholders, project partners.
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.		368 118	
1.1 Methodologies for Climate Change impact assessment training course	The course will be realized in Florence by IBIMET-CNR and it will be addressed to 25 technicians of the National Agricultural and Agrometeorological Technical Services of CILSS/ECOWAS countries.	IBIMET, AGRHYMET, WMO staff, participants, missions, invited trainers and logistics.	108 742	Participation of stakeholders, project partners, selection on the basis of application form.
1.2 Climate services for disaster prevention training course	The course will be realized in Florence by IBIMET-CNR and it will be addressed to 25 technicians of the National Agricultural and Agrometeorological Technical Services of CILSS/ECOWAS countries.	IBIMET, AGRHYMET, WMO staff, participants, missions, invited trainers and logistics.	108 742	Participation of stakeholders, project partners, selection on the basis of application form.
1.3 Agrometeorological Services for agriculture and water use training course	The course will be realized in Niamey by AGRHYMET and it will be addressed to 25 technicians of the National agro-hydro-meteorological services of CILSS/ECOWAS countries.	AGRHYMET, IBIMET, WMO staff, participants, missions, invited trainers and logistics.	75 317	Participation of stakeholders, project partners, selection on the basis of application form.
1.4 Agrometeorological Services for rainfed crops training course	The course will be realized in Niamey by AGRHYMET and it will be addressed to 25 technicians of the National agro-hydro-meteorological services of CILSS/ECOWAS countries.	AGRHYMET, IBIMET, WMO staff, participants, missions, invited trainers and logistics.	75 317	Participation of stakeholders, project partners, selection on the basis of application form.

Intervention logic	Description	Means	Costs (€)
Expected result 2	The Regional network that brings together the community of technical services involved in CCA and DRR is strengthened thanks to a better collaboration and an improved technical and scientific cooperation among National HydroMeteorological Services, other technical services and regional and international institutions.	185 626	
2.1 Regional Networking Conference	After the four training courses a conference will be organized in Rome, Italy to strengthen the network of community service technicians involved in the program (2 days, 60 persons representatives of NHMS from CILSS/ECOWAS countries, Regional/international organizations, RTCs)	Staff, logistics, training, seminars material.	109 094 Participation of stakeholders, project partners.
2.2 Mentoring	Mentoring activities to support exchanges of interests and experiences among participant and to develop partnerships to propose future programs of research / development and study exchanges.	Staff, logistics, training, seminars material, logistics, distance learning tools	76 532 Participation of stakeholders, project partners.

8. Detailed Chronogram

	Activity / Month	2017										2018											
		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					Q						F
0.3	Identify connections with relevant region projects	X																					
0.4	LOAs in place	-	-	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	
1.1	<i>Training Course on Climate services for disaster prevention (extreme events) - Italy</i>																						
1.1.1	Prepare selection criteria for each course		X																				
1.1.2	Prepare course information		X																				
1.1.3	Announcement to PRs and national representative of CILSS (for nominations) (ask for consultation with CILSS)		X																				
1.1.4	Identify lecturers, Course 1			X																			
1.1.5	Select participants, Course 1				X																		
1.1.6	Course materials (summary of key points) provided for translation by lecturers							X															
1.1.7	Event									X													
1.1.8	Activity report											X											
1.2	<i>Training Course on Methodologies for Climate Change impact assessment - Italy</i>																						
1.2.1	Prepare selection criteria for each course											X											
1.2.2	Prepare course information											X											
1.2.3	Announcement to PRs and national representative of CILSS (for nominations) (ask for consultation with CILSS)											X											
1.2.4	Identify lecturers, Course 2												X										

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1.2.5	Select participants, Course 2										X								
1.2.6	Course materials (summary of key points) provided for translation by lecturers											X							
1.2.7	Event													X					
1.2.8	Activity report														X				
1.3	<i>Training Course on Agrometeorological Services for agriculture and water use (irrigation and horticulture) - Niger</i>																		
1.3.1	Prepare selection criteria for each course					X													
1.3.2	Prepare course information					X													
1.3.3	Announcement to PRs and national representative of CILSS (for nominations) (ask for consultation with CILSS)					X													
1.3.4	Identify lecturers, Course 3						X												
1.3.5	Select participants, Course 3							X											
1.3.6	Course materials (summary of key points) provided for translation by lecturers									X									
1.3.7	Event										X								
1.3.8	Activity report											X							
1.4	<i>Training Course on Agrometeorological Services for rainfed crops - Niger</i>																		
1.4.1	Prepare selection criteria for each course													X					
1.4.2	Prepare course information													X					
1.4.3	Announcement to PRs and national representative of CILSS (for nominations) (ask for consultation with CILSS)													X					
1.4.4	Identify lecturers, Course 4														X				
1.4.5	Select participants, Course 4															X			
1.4.6	Course materials (summary of key points) provided for translation by lecturers																X		X
1.4.7	Event																		
1.4.8	Activity report																		

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		2017										2018											
		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
2	Expected result 2																						
2.1	Networking Conference																						
2.1.1	Prepare Conference information																		X				
2.1.2	Announcement to PRs and national representative of CILSS/ECOWAS Regional Centers and International organisations																		X				
2.1.3	Define programme																			X			
2.1.4	Conference materials																				X		
2.1.5	Event																					X	
2.1.6	Activity report																					X	
2.2	Mentoring and support																						

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