



World Meteorological Organization
Weather • Climate • Water

METAGRI SERVICES

Project Concept Note



1 - Introduction

According to the World Bank, agriculture is the main industry in Sub-Saharan Africa which employs 65% of the labor force and accounts for about a third of gross domestic product in these countries. Small-scale farmers (less than 2 hectares) provide about 80% of the food supply in Africa. The main characteristics of production systems of these smallholder farmers include simple, rudimentary technologies, low returns, and high seasonal labor fluctuations with women playing a vital role in production.

Most African small-scale farmers plan agricultural production based on rainfall, anticipating both good and bad years. There is an uneven distribution of rainfall, exacerbated by climate change and already being experienced across the region which threatens crop production. Studies have found that among small-scale farmers, rainfall is the most important climatic factor critical to their survival, particularly for their crop growth and livestock herds.

Despite those constraints, African agriculture has enormous potential for growth. This stems from the continent's abundant natural resources, particularly land, and the large yield gap that countries can explore to increase food security and reduce poverty. Sub-Saharan Africa has the highest proportion of rural poor and the greatest potential for smallholder agriculture-led poverty reduction. Studies have indicated that a 1% increase in agricultural per capita GDP reduced the poverty gap five times more than a 1% increase in GDP per capita in other sectors, mainly among the poorest people. Agriculture employs a large number of people in Sub-Saharan Africa and increasing productivity is essential to reducing poverty and food insecurity.

2 – Background

About 20 years ago, there was a demonstration project activity in Mali where the Meteorological Service routinely organized Roving Seminars which provided a framework for dialogue between officials of National Meteorological and Hydrological Services (NMHSs) and farmers, with a view to empowering the latter with agro-climate information to better manage meteorological and climate-related risks for sustainable agricultural production.

These practices improved results in agriculture production and reduction of losses. For instance, studies showed that the effective use of weather and climate information by farmers has reduced the re-planting rate by 35% and increased crop yields by 20% to 25% on average, compared to farmers who did not use this information. And there were also reported strengthened institutional capabilities at the NMHS. For instance, Mali now enjoys effective collaboration between government agencies, research institutions, media, extension services, and farmers.

In October 2007, a Conference of Directors of West African National Meteorological and Hydrological Services (WADC) expressed the need to increase the interaction of their services with the farming community.

Based on the experience from Mali, the METAGRI project was developed and funded by the Meteorology Agency of Spain (AEMET). The seminars were organized in the following countries: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Nigeria, Senegal, and Togo.

From 2008 to 2011, a total of 7222 people participated in the seminars of which 5699 were rural farmers and the rest were from meteorological services, agricultural extension agencies and other national technical institutions. Almost a thousand women – who are often the backbone of the farming community – were trained to better use weather and climate information. A total of 3095 rain gauges were distributed to farmers in 2606 villages.

The farmers used the rain gauges to monitor accumulated rainfall at the start of the season in order to make better planting decisions for soil moisture estimation at village level. Thus, tailored weather and climate information would support critical decisions as the right choosing of variety and right seed time according real local conditions.

An extensive review of these activities were made at a meeting held in Bamako, September 2011 and the METAGRI-OPERATIONAL (METAGRI OPS) project was developed in order to operationalize the efforts and ensure the viability of gains made through the METAGRI project. The METAGRI-OPS project was subsequently funded by the Norwegian Ministry of Foreign Affairs.

The METAGRI-OPS project main objectives were to improve decision making at small holder farmer level by providing useful information on climate and weather, seed calendars, and by providing a simple plastic rain gauges to farmers.

These objectives were achieved through activities grouped into components, the first one being the development of operational improvements on the Roving Seminars such as review of the performance of the plastic rain gauges, analysis of weather and climate risks related with agriculture, integration of traditional knowledge, and production of a basic manual on conducting Roving Seminars. It also directly targeted capacity building within NMHSs to improve skills in crop modeling, use of remote sensing data and products and GIS tools. The project also aimed at facilitating collaboration between NMHSs and the media at national, regional and local level and developing a communications strategy for effective dissemination of agro-meteorological products. Finally, the project developed feedback and evaluation processes through the assessment of impacts and user satisfaction.

Three additional countries Chad, Liberia, and Sierra Leone, and Seminars for Fishermen were incorporated into METAGRI-OPS project activities, bringing the number of countries involved in the project to 17 and opening to a new category of users those advices on climate and weather. In particular, a set of color flags was delivered for artisanal harbors, inlets or beaches to broadcast expected sea conditions to fishermen operating nearby. From 2012-2015, 269 Seminars for Farmers and Fishermen were held, 4827 rain gauges and 200 flags were distributed. A grand total of 12499 persons were trained, 11162 of them were farmers or fishermen. Only 13% of those trainees were women. A grand total of 4652 villages were represented at those Seminars

During the course of project, partnerships have been developed at the national levels and with regional institutions such as the AGRHYMET Centre and participation in Economic Community Of West African States (ECOWAS), Inter-state Committee against Drought in the Sahel (CILSS-Comité inter-État de lutte contre la sécheresse au Sahel) and CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) meetings. The METAGRI-OPS project developed Roving Seminars for Fishermen in several West African countries with coastal areas and Pastoralists in Chad. The project also contributed to the implementation of Global Framework for Climate Services in Western Africa and support global activities by validating concepts applicable to other regions. A final METAGRI-OPS project evaluation report was delivered in early 2016 which concluded that the project scored “High” in relevance, effectiveness and sustainability and “Medium” in efficiency and impacts.

These criteria were based on the Organization for Economic Co-operation and Development (OECD) methodology.

In November 2015, there was a workshop in Abidjan, Côte d'Ivoire that reviewed the METAGRI-OPS project. Discussions during this workshop focused on the development of a new project proposal for consolidating the advances of the METAGRI and METAGRI-OPS projects into the operational delivery of weather and climate products and services for agriculture.

3 – Development of the METAGRI-SERVICES Project

The first METAGRI project (2008-2011) was developed under the guidance of Conference of Directors of West African National Meteorological and Hydrological Services. This Conference provided insight to the main objectives of the various projects.

Under this guidance, the METAGRI-OPS project consolidated activities of the Roving Seminars under the METAGRI project and other operational aspects that support product delivery were targeted. One of WMO priorities is assist the NMHS with providing better services to their various users by providing good quality products in close interaction and cooperation with governmental and private users. There is a need for a sustained effort in reinforce technical skills at the NMHS, information processing systems, delivery channels and consultation and interaction mechanisms with a wide range of users. Services for agriculture need a consolidated cooperation with partners as the Ministry of Agriculture and more and more use of ground based data, remote sensing and models (weather and biological) outputs.

One of the issues raised during the METAGRI and METAGRI-OPS projects was that only about 10% of the participants were women. This is despite the fact about half of the women in the world are active in agriculture – 60% in developing countries and 70 % in low-income food-deficit countries. Figures also show that female farmers generally have less access to land, fertilizers and machinery as well as financial and extension services. Therefore, it is urgent to provide women with equitable access to weather and climate services to improve the productivity on their farms.

While a great deal of weather and climate knowledge is prepared at the global and regional levels, it is the NMHSs and their partners that typically deliver pertinent information to the public and to those employed in local climate-sensitive economic sectors as agriculture, livestock, forest, rangelands management or artisanal fisheries. In Western Africa, there is a need for external support. The WMO-led Global Framework for Climate Services (GFCS) provides a mechanism for mobilizing additional partners to assist the many countries that lack such capacity so that they too can deliver and use science-based information for climate action, build resilience and manage the opportunities and risks of climate variability and climate change.

WMO has developed fruitful cooperation with United Nations Food and Agriculture Organization (FAO) in METAGRI OPS working together in Roving Seminars in Liberia and on remote sensing training activities. This cooperation would be enhanced on the next project and discussions are underway to ensure good coordination and better collaboration between NMHSs and Ministries of Agriculture. As food security is a key issue in Western Africa, the World Food Programme (WFP) has develop crop monitoring activities and is also involved on supporting the Agriculture GFCS priority area.

To further improve agricultural meteorology service delivery and fulfill WMO and Western Africa NMHSs commitments on the above mentioned challenges, a new project is to be developed and implemented in Western Africa based on the outcomes of the previous METAGRI and METAGRI-OPS

project. The new project is to be named METAGRI SERVICES and it is proposed to last from 2016 to 2019. NMHSs, NGOs, regional institutions as AGRHYMET and African Centre of Meteorological Applications for Development (ACMAD), and international organizations such as FAO and WFP are expected to participate at different levels.

4 – PROJECT AREAS OF ACTIVITY

The overall goal is to provide suitable meteorological and climate-related information and products to all users but with special focus on rural producers, farmers, shepherds and fishermen, in West Africa. WMO and NMHSs have provided training for thousands of farmers in West Africa on how to access and use weather and climate information to maximize yields, minimize risks and increase food security in a region heavily dependent on seasonal rainfall and thus vulnerable to droughts and floods. The new project will address the needed to improve products quality, broadcasting channels, feedback information and carefully integrate gender issues. Different sectors among food producers, in particular farmers, pastoralist and artisanal fishermen, will be approached with measures designed to to develop resilient communities confronted by climate and weather risks and hazards.

4.1 SPECIFIC AREAS OF ACTIVITY

1. Reinforcing and extending the operational model of agrometeorological assistance to rural areas of West Africa which includes the organization of Roving Seminars, the provision of rain gauges, and development of advice on decisions related to crops, fisheries and livestock;
2. Improving the system for communication between farmers and NMHSs, through rural radios and participation of local leaders and traditional knowledge bearers;
3. Improve NMHS staff technical skills in remote sensing, Geographical Information Systems, decision making support systems including crop models;
4. Increase feedback from food producers to NMHSs including daily rainfall observations, crop status and relevant weather phenomena, and data quality control procedures to improve quality of NMHSs products and services to farmers;
5. Support regional programs on food security and food production from ECOWAS and other institutions;
6. Improving soil moisture measurements and calibration of remote sensing data in selected sites;
7. Improving women's access to climate and weather information in rural areas;
8. Developing specific products, tools and services for the following agricultural sectors: rain-fed crop; orchards; artisanal fishing along coastal areas, rivers and lakes; livestock; and forestry;
9. Developing a project management model more efficient in sharing NMHS responsibilities and tasks at regional level to improve regional cooperation;
10. Contributing to WMO and other partner's institutional commitments on international initiatives and frameworks as GFCS, CREWS (Climate Risk and Early Warning Systems), IDMP (Integrated Drought Management Programme) and GACSA (Global Alliance for Climate-Smart Agriculture) in Western Africa.

5 - EXPECTED RESULTS

Result I: Roving seminars methodology is improved in terms of climate and weather information substance and form, including a better plastic raingauge, and seminars are conducted regularly or an on-going basis for the benefit of West African farmers, shepherds or pastoralist and artisanal fishermen.

Result II: Farmers have access to modern, updated and effective decision-making tools based on reliable remote sensing products and tested crop models.

Result III: Media, especially rural radios, play an active role disseminating climate-related information to producers. Communications technologies are adequately involved.

Result IV: Feedback systems and validated methods for information and evaluation are introduced and operationalized.

Result V: Institutional and non-institutional cooperation frameworks are established with partner institutions and decision-makers. The project is integrated at the Western Africa agriculture programs and at national level plans and contributes to regional implementation of GFCS, CREWS, IDMP and GACSA.

Result VI: Doubling the number of women that have access to climate and weather information for decision making at rural areas

Result VII: Specific tools for farmers, orchards managers, fishermen, shepherds or pastoralists and forest/rangelands managers to improve their decision making through adequate use of climate and weather information.

Result VIII: Multi-hazard Early Warning Systems are established, including drought and sand and dust alerts, with special emphasis on food production and food security, and coordinated by national Interdisciplinary Working Groups.

6 - PROJECT COMPONENTS

Component 1: Seminars and simple plastic raingauges. Improving seed calendars, improved data bases. Structured and consolidate data recording and field status information feedback. Improved plastic raingauges and observation methods. Inclusion of traditional knowledge at Roving Seminars and climate services know-how. Development of Climate Smart Agriculture tools based on improved agrometeorological bulletins and advisories.

Component 2: Training. Improvement of technical skills on crop models, remote sensing and GIS at NMHSs. Crop model verification activities. Soil moisture verification activities. Development of agrometeorological atlases for the region and individual countries.

Component 3: Improved climate and weather communication for agricultural decision making. Development of partnerships with local radio and mobile phone service providers.

Component 4: Evaluation of impacts of the use of weather and climate information in agriculture. External evaluation. Assessment on socio-economic benefits in agriculture associated with weather and climate information management.

Component 5: Improvements in access to weather and climate information for women in agriculture. Roving Seminars for women and youth. Promotion of stakeholder involvement in rural woman development.

Component 6: Development of weather and climate risk management in agriculture and food security. Developing risk maps and assessments. Developing monitoring tools with special focus on drought. Implementation of Nowcasting Satellite Applications Facility (NWC SAF) software. Development of sand and dust warnings and advisories. Support to risk management. Cooperation with national and regional institutions on Early Warning Systems and CREWS start-up.

7 – STAFFING

WMO staff based at the Agricultural Meteorology Division in Geneva will coordinate the project and would propose Letter of Agreements (LOA) to transfer funds and Special Service Agreements (SSA) for contractors to implement activities. They will report regularly to WMO Resource Mobilization Office about project progress. WMO Regional Office in Abuja would support activities with special focus in liaising with regional western African institutions and would host a consultant if necessary

Staff in Geneva – WMO Headquarters:

- Project coordinator (Regular Staff WMO at Agricultural Meteorology Division)
- Secretarial support (WMO staff partially funded through the Project)

Staff in Abuja – WMO Regional Office:

- Project officer – Liaison with ECOWAS and Western African Institutions (Regular Staff WMO at sub-regional Office in Abuja)
- Consultant – According with the level of activities and funding, a consultant would be hired to coordinate activities at component level or to support overall management. This solution would be activated only after reaching full project development and funding.

Staff at the NMHS

- Every country would supply a national Focal Point as in the previous METAGRI and METAGRI project as a contribution in kind.
- Activities at the countries would be regulated through Letters of Agreement between WMO and each NMHS.
- If the project development needs for extraordinary activities at the region or at one country that could not be performed regularly by the NMHS, an Special Services Agreement could be proposed to pay a NMHS staff member or one national expert to perform those extraordinary duties according WMO and national regulations.

Staff at Component Management

- Due to the very specific nature of components 3 (communication) and 4 (evaluation), it is proposed to hire one external consultant at each component to coordinate and animate activities. Most probably would be Ms. Oumy N' Diaye and Mr. Vieri Tarchiani that have performed successfully those tasks at METAGRI OPERATIONAL project.
- The Centre AGRHYMET would have a central role on component 2 (training). SSAs or LoAs would be developed to support activities in close cooperation with WMO AgM Division.
- Component 1 is one of the larger components in terms of expected activities and would need to have two consultants to support activities, one of them to develop contributions to Climate Smart Agriculture practices and climate change adaptation and provide technical review of supporting documents. They would be a Western Africa (WA) expert and would be decided through open competition in the region. The second consultant would work on Roving Seminars improvements through the integration of traditional knowledge, proposing improvements on data recording and data retrieval, and collect gauges performance reports). They would be also a Western Africa expert and would be decided through open competition in the region.
- Component 5 (gender) would need to be coupled with other national or regional initiatives. An external consultant would be needed to identify, partners and funding.
- Component 6 (EWS-CREWS) would the most complex and external support would be needed. It is foreseen that two consultants would be needed, one for English Speaking countries and another for French Speaking countries, to develop activities and documentation in both languages.

8 - LOGICAL FRAMEWORK

(see Annex 1)

9 - GEOGRAPHICAL AREA AND PROJECT DURATION

The METAGRI-SERVICES (proposed name) project is expected to last the same four years as the previous ones. The project would cover again all ECOWAS region countries plus Mauritania, Chad and Cameroon (18 countries).

10 - BUDGET AND FINANCING

- According with previous projects experience (1 Million Euros spent in METAGRI 2008-2011, and about 500 thousand Swiss Francs average by year from 2012-2015 in METAGRI-OPS), it would be expected an minimum annual average expenditure of around 1 Million Swiss Francs giving a total budget of 4 Million Swiss Francs over four years and 18 countries. That should be a minimum that could be raised to around 7-8 Million Swiss Francs by scaling up activities or develop pilots on promising new activities of validation of those pilots in other regions in the world. As new components are going to be developed, final expenditure would be closer to the upper ceiling if the work is properly done and resources are provided
- Component 1 (Roving Seminars and associated activities) would be 30%, Component 2 (Training) would be 25%, Component 3 (Improved broadcasting) would be 7.5 %, Component 4 (Evaluation) would be 10%, Component 5 (Gender) would be 7.5 %, Component 6 (EWS and risk management) would be 10% and Management would be 10%
- Possible donors that would be invited to discuss project development and to contribute would be Norway that funded about 75% of the previous METAGRI OPERATIONAL project, Spain that funded almost all the previous METAGRI project, USAID to support food security activities at least in some countries and regional funding institutions.
- Cooperation or contributions in kind from other UN Agencies would be seek, in particular with FAO and WFP having in mind the relevance of food production and food security in Western Africa. Joint contributions to the GFCS Agriculture and Food Security Priority Area would also be expected.

11 - PROJECT LAUNCH

As soon as the project documents has been approved by the NMHSs in West Africa and initial funds are raised. The project would start prioritized activities according the level of funds obtained. Presentations would be provided at the Western Africa NMHS Directors Conference to be held in Nouakchott, Mauritania from 19-21 April 2016.

12 - TECHNICAL PROJECT MANAGEMENT

WMO handled the technical and administrative management of the project METAGRI OPERATIONAL. Given the more complex structure in term of additional components and higher number of activities per component proposed at the new project, the need for better involvement and feedback from the Western Africa NMHS and the need to access external resources is a key point on its development and success. To ensure a reliable management and to make a project proposal to technical and financial institutions, a new project control and management structure from previous METAGRI projects is proposed.

At the national levels, the project will be again piloted by national Focal Points as it was in the past, but it is proposed to create two Committees or Groups at regional level. The Technical Management

Committee that would take care of operational aspects at each component and will work very closely with WMO Project officers in Geneva that could be part of this Committee.

It is proposed to create also an Operational Committee to provide Scientific and Technical Guidance and to elaborate and propose Annual Operative plans at the end of each year. Those plans would propose activities to be performed and requested for funding with a careful priorities setting. Meetings would be on-line due to the extremely wide range of activities that the project has to cover and the need to keep funds for them. This Operational Committee would have an annual meeting at the last Quarter each year.

Finally, annual plans would be submitted to the Conference of Directors of Western Africa NMHS for approval. WMO would keep administrative management and secretarial support but some tasks would be performed by NMHS or individual persons. Those tasks would be supported financially through Letter of Agreements and Special Service Agreements.

Operational Committee (Scientific and Technical Guidance)

Proposed composition:

- Seydou Traore (AGRHYMET)
- Daouda Diarra (Mali-Member of WMO Commission for Agricultural Meteorology)
- Julie Ukeje (Nigeria-Member of WMO Commission for Agricultural Meteorology)
- 3 Focal points rotating each year
- WMO Secretariat. Agricultural Meteorology Division and Regional Office of West Africa
- GFCS Officer
- Secretarial support provided by WMO
- Observers: Donors.
- Partner organizations e.g. WFP, FAO, FEWSNET

Meeting: 1 meeting/year at least by teleconference / Skype

Terms of Reference. Propose annual plan, set priorities and propose budget. To be delivered to WADC for approval each year. Actions would be shaped according available funds. Priorities would be proposed.

Annex 1. Logical Framework

This framework is still being developed

Component 1: Roving Seminars and simple plastic raingauges. Operational aspects and improvements					
Specific objectives	Activities (detail number and countries). Activities breakdown		Expected results	Evaluation indicators	Budget
Roving Seminars contents to be updated and improved according to final users as farmers, fishermen, pastoralists and forest agents	Roving Seminars	<ul style="list-style-type: none"> • Basic guide on common methodology; • Basic manuals in national languages; • 3 Roving Seminars per country/year (recommended) for farmers, shepherds and fishermen; • Development of Climate Field Schools in four countries. 	Farmers have access to reliable climate and weather information based on, ground observations, crop models and remote sensing through modern information tools and their decision making is improved	<ul style="list-style-type: none"> • Basic common guide available; • Each country has basic manuals in their main national languages • A list of crops, livestock and fishermen activities that has been object of seminars is provided and results obtained are shown • List of RS collaborating institutions per country 	
	Development of Climate Smart Agriculture support tools; Water harvesting component, Cooperation with FAO	<ul style="list-style-type: none"> • Guide on CSA practices in French and English. FAO support; • Changes at Roving Seminars programme including CSA approaches; • Community based approach on the use of climate and weather information to improve management on crops, livestock and forest. 	Agricultural practices improved. More sustainable agriculture promoted and practices,	<ul style="list-style-type: none"> • More efficient use of water and manure • Integrated agriculture practices combining crops • Recycling practices • Less failures in crops 	

	Support Interdisciplinary Working Groups (IWG) on Climate Service provision and delivery	<ul style="list-style-type: none"> • Develop a seasonal seed calendar for agro-ecological zones; • Improved methodology and quality of product for bulletins and advisories (seed calendars, sustainable agricultural practices, inputs and pesticides management); • Support farmers weather and crop status observations and feedback data flows to IWGs; • Support to agricultural and climate databases management and sharing practices among IWG and AGRHYMET. 	Products and advisories and institutions performance are improved country by country.	<ul style="list-style-type: none"> • Number of bulletins and advisories provided country by country. List of improvements from the beginning to the project end; 	
Simple plastic rain gauges improved according experience from METAGRI-OPS	New prototypes. Open tender for rain gauge moulds and delivery. Supply rain gauges to countries.	<ul style="list-style-type: none"> • Two moulds for improved plastic rain gauges prototypes are made. One for Sahelian region and the second for Gulf of Guinea countries; • Improved quality; • Prototype quality and performance controls; • Manufacturing and transport to the countries; 	Improved plastic rain gauges	<ul style="list-style-type: none"> • Quality and performance reports. 	

Traditional knowledge taken in account on Roving Seminars contents and at the Programme. Local languages are used.	Listing traditional knowledge practices and climate variability indicators per country.	<ul style="list-style-type: none"> • Defining questionnaires and surveys (four types for four regions); • Travel to selected rural communities and survey execution; • Reporting on practices according obtained information at the end of 2017; • Proposal of practices to be incorporated at Roving Seminars; 	Improved Roving Seminars by adding useful traditional knowledge practices.	<ul style="list-style-type: none"> • List of traditional knowledge practices and climate variability indicators per country. Final report • Proposals for improved Roving Seminars 	
	Local languages are taken in account	<ul style="list-style-type: none"> • Roving Seminars documents translation to main national languages and incorporation of traditional knowledge practices 	Improved communication practices at Roving Seminars	<ul style="list-style-type: none"> • Roving Seminars support documents available at main national languages; • Mission reports on effectiveness of those practices. 	

Component 2: Development of operational tools and training				
Specific objectives	Activities (detail number and countries). Activities breakdown	Expected results	Evaluation indicators	Budget
Train the NMS in the use of crop models and remote sensing data for agrometeorological monitoring	Training in the new version of the SARRA-H model for agricultural campaign monitoring	Regional training for French and Portuguese speaking Countries		
		Regional training for English speaking Countries		
		National training workshops		
	Training in the INSTAT+ software for the computation of the onset and cessation dates of the rainy season, the duration of dry spells and other agroclimatological analyses	Regional training for French and Portuguese speaking Countries		
		Regional training for English speaking Countries		
		National training workshops		
	Training in the QGIS software	Together with activity 1.1.		
	Training in the generation of provisional sowing calendars	Three (3) weeks on-the-job trainings at AGRHYMET		
	Training in a simple agrometeorological database management software (CLIMSOFT or other)	Will be done together with activity 1.2		
	Training in agroclimatological analysis tools (merging satellite and ground data, RClimdex, RHTest) in the R environment	Regional training for French and Portuguese speaking Countries		
		Regional training for English speaking Countries		
		National training workshops		
	Training in the methods of forecasting the agroclimatic characteristics of the rainy season	Organization of 1 week pre-forum and 1 week forum for PRESAGG		
Organization of 1 week pre-forum and 1 week forum for PRESASS				

Component 2: Development of operational tools and training				
Specific objectives	Activities (detail number and countries). Activities breakdown	Expected results	Evaluation indicators	Budget
	Training in remote sensing products useful in agrometeorology: vegetation indices, rainfall estimations, PET, Temperatures, solar radiation (after evaluating different available sources)	Regional training for French and Portuguese speaking Countries		
		Regional training for English speaking Countries		
		National training workshops		
Improve the performance and reliability of agrometeorological tools and services. Support from external partners. (FAO, AEMET,...)	Pursue the improvement of the SARRA-H model and its environment	Combine the tabular and spatial versions of SARRA-H to enable the combined or alternate use of ground observations and satellite derived meteorological input data		
		Adapt and evaluate the SARRA-H model under the humid guinea coast and Cape Verde Islands agroclimatic conditions	Acquire and install automatic weather stations, GPSs and other small equipment for agronomic experimentations at the new sites for the adaptation and evaluation of the SARRA-H crop model	
		Adapt and evaluate the SARRA-H model for the cowpea crop		
		Test the impact of the use of satellite derived meteorological data on model outputs relatively to ground observation data		

Component 2: Development of operational tools and training				
Specific objectives	Activities (detail number and countries). Activities breakdown	Expected results	Evaluation indicators	Budget
	Acquire or develop models for some perennial and tuber crops (coffee, cocoa, rubber, yam, etc)			
	Evaluate remote sensing products that best correspond to West African agroclimatic conditions			
	Prepare a regional atlas on agriculture (crops, climate regions, land cover) and provision of mapped agrometeorological products. (Support AEMET)	Adequate mapping software from AEMET to AGRHYMET databases in Niamey	Software running connected with operational databases. Problems reported	
		Product development. Regional atlas	Agro climate regions characterized, crop mapping and land use products available.	Climate atlas annual maps produced, Land cover map at regional level
		Adequate software in four to five countries for developing national maps and products		
	Run crop simulation models with seasonal forecasts results for yield forecasting			

Component 2: Development of operational tools and training				
Specific objectives	Activities (detail number and countries). Activities breakdown	Expected results	Evaluation indicators	Budget
	Assist agricultural users in making decisions by using ground data to valid remote sensing products. Perform soil moisture comparisons and provide better income to crop models. George Mason University involved.	Purchase and install soil moisture sensors for five selected NMHS		
		Make ground truth assessment for remote sensing products on soil moisture		
		Coupled with crop models, provision of operational products at regional level and national level (five countries)		

Component 3: Improved Climate and Weather communication for agricultural decision making					
Specific objectives	Activities (detail number and countries). Activities breakdown		Expected results	Evaluation indicators	Budget
Facilitate access to weather and climate information & services for the media and other users	Develop or renew and maintain operational web sites and promote interactive web tools	Prepare detailed specifications with dates of delivery of mock up and final version	Specifications approved by an IT specialist are available	1 web site is created/renewed in all METAGRI countries except from Nigeria	\$4000 per country
		Hire web developer	Web developer is selected among 3 short listed service providers		
		Follow the respect of specifications	The steps of the creation/renewal of the website described in the specifications are followed		
		Launch and promote the website and online activities related	Vibrant, up to date and interactive website with all relevant social media tools is launched		
		Ensure the daily update and collection of indicators of actual use	The daily update of the website is ensured		
		Number of countries: 10			
	Support Interdisciplinary Working Groups (GTP) communication aspects	Assess the communication activities of GTP in all countries	Report assessing the communication activities of the GTP is available	One report is produced in each country where a GTP exists	\$ 1000 /eligible country
		Propose appropriate new activities (use of the web site and a distribution list to expand the readership of decadal briefs, use of mobile phone and rural radio to disseminate the information released by the GTP etc...	Project document for the communication activities of the GTP using a standard format is prepared	One project document is produced in each country where a GTP exists	\$ 1 000/eligible country

Component 3: Improved Climate and Weather communication for agricultural decision making					
Specific objectives	Activities (detail number and countries). Activities breakdown	Activities	Expected results	Evaluation indicators	Budget
Create the conditions for sustainable collaboration between the NMHS and the media, particularly the community/rural radios	Negotiate and sign agreements with community/rural radios for the production and broadcasting of weather and climate advisories and products for farmers	Establish a list of possible partners among the rural radio stations	The review of the existing radio stations and the selection of the relevant ones based on solid justifications is carried out	One document on the selection of radios eligible to collaboration with NMHS is produced in each METAGRI country	\$1000/country Senegal 12000€ / year but 80 radios. Evaluate external sponsorship possibilities.
		Prepare and agree on a standard agreement document clarifying the roles and responsibilities of the NMHS and the rural radio stations and designing a monitoring and evaluation mechanism	An agreement/MoU is discussed and signed after agreement	A minimum of 3 MoU are signed in each METAGRI country	NA
		Sign documents, launch the collaboration and ensure collection of data for the M&E mechanism	Signed documents are published		NA
	Engage with the community/rural radios in finding sustainable funding of those activities	Prepare a short proposal (2 pages) for a standard 2 years project allowing a rural radio to produce and broadcast weather related programs	Project document using a standard format is prepared	One project document is produced in each METAGRI country	
		Identify together all companies/institutions likely to engage in supporting the dissemination of weather forecasts and climate services through their Social Corporate Responsibility portfolio	The list of relevant companies/institutions is prepared;	A minimum of 3 companies/institutions are identified and approached in each METAGRI country	NA
		Organize short briefs of the Senior Management of the	Meetings are organized; follow up	1 brief is organized in each METAGRI country	To be determined

Component 3: Improved Climate and Weather communication for agricultural decision making					
Specific objectives	Activities (detail number and countries). Activities breakdown	Activities	Expected results	Evaluation indicators	Budget
		companies/institutions allowing a clear understanding of the critical role of weather forecasts and climate services and financial commitment	activities are identified		
Target mobile phone companies to ensure timely dissemination of weather and climate products and services	Develop partnerships between NMHS and mobile phone companies to improve communication and feedback	Prepare a short PowerPoint on the existing models (Gambia, Ghana, Senegal) Meet with the marketing departments and share the PowerPoint – Discuss modalities for adapting/replicating	Meetings with the relevant departments of the mobile phone companies are organized Information on success stories is shared Proposals for local options are discussed	A minimum of 3 meetings with mobile phone companies are organized in each METAGRI country	NA
	Promote joint developments on Smartphone tools	Present the work done in the Gambia to stimulate creativity Monitor e-agriculture trends and share all new applications using mobile phone to facilitate the dissemination of weather related information	Information on Gambia success story is shared Subscription for receiving e-agriculture updates is done	Idem	NA
Develop the skills of all actors for effective weather	Promote a wider use of traditional knowledge in delivered products and services using local languages	Identify tertiary education institutions with students likely to have an interest in research on traditional knowledge related to weather products and services in local languages Discuss and agree on modalities to support the work of the students and the ensure quality results to be used by the NMHS Identify local resource persons and	Relevant institutions are identified and contacted Modus operandi of the project is discussed and agreed Local resource persons are identified by NMHS field partners Documentation	A minimum of 4 students (2 male and 2 female) interested in research on traditional knowledge on weather and climate are selected in each METAGRI country and receive a stipend for the project A minimum of 6	\$7000/country

Component 3: Improved Climate and Weather communication for agricultural decision making					
Specific objectives	Activities (detail number and countries). Activities breakdown		Expected results	Evaluation indicators	Budget
and climate information & services including river levels for run-of-river irrigation		agree on modalities ensuring the collection of relevant information Ensure the publication of all relevant knowledge with support from institutions in charge of the promotion of local languages	produced by students and resource persons is published in official and local languages	resource persons (3 male and 3 female) are identified and interviewed in each METAGRI country 1 publication (print + electronic) collating the data is available in official and local languages	
	Organize joint training sessions for NMHS staff (communication skills) and journalists (climate and weather)	Identify trainers for the climate and weather content Identify trainers for the communication content Supervise preparation course material on climate and weather content (cf. countries where the training has already been organized e.g. Mali) Supervise preparation of course material on communication Identify participants (cf. lists of participants of meteo media days) Plan and hold training sessions Identify a follow up mechanism	Individual trainers or relevant institutions are identified and contacted The course material reviewed by experts is available The list of participants is available The calendar for the training sessions is agreed and implemented	A minimum of 2 training sessions (3 days) are organized in each METAGRI country; The participants should include a minimum of 30% of women	To be determined

Component 4: Evaluation of impacts on the use of weather and climate information in agriculture					
Specific objectives	Activities (detail number and countries). Activities breakdown		Expected results	Evaluation indicators	Budget
Monitoring and Evaluation of METAGRI SERVICES implementation	Definition of the Monitoring and Evaluation framework: definition of the reporting guidelines for countries including detail of indicators, how indicators are calculated and which data have to be yearly provided by the countries		A Monitoring and Evaluation framework is defined	Reporting guidelines are defined and approved during the first 6 months of the project	
			A set of Monitoring indicators is defined	All the countries adopt the reporting guidelines since the first year	
	Data collection by the countries during the whole length of the project	Contribution in kind NMHSs	Each country collects the data for the Monitoring&Evaluation	% of completeness of collected data by country	
	Annual reporting by countries according with the reporting guidelines and including the set of data for the Monitoring&Evaluation		Reporting rules are respected by countries	All the countries provide the requested data/indicators in the annual reports	
	Annual monitoring: At the end of each year analyze the implementation in the different countries and provide advices on the measures to be adopted		Each year the level of implementation of the project is monitored	Implementation indicators available for all countries for the whole length of the project	
	Mid-project evaluation: At the end of the second year preparation of a progress report on the implementation evaluation of METAGRI SERVICES		Mid project progress report produced covering all the involving countries	The report is produced at the end of the second year	
	Project final evaluation: At the end of the project preparation of an implementation evaluation report		Project final evaluation report produced covering all the involving countries	The report is produced at the end of the project	

Component 4: Evaluation of impacts on the use of weather and climate information in agriculture

Specific objectives	Activities (detail number and countries). Activities breakdown		Expected results	Evaluation indicators	Budget
Evaluation of METAGRI SERVICES impacts on farmers' behavior and crop productivity		Revision of the evaluation protocol: the evaluation protocol used for METAGRI OPS is revised taking into consideration the recommendation of the METAGRI OPS final workshop	An evaluation protocol is defined	The protocol is available within the first 6 months of the project	
		Design a database for managing the data to be collected	A relational database for the evaluation purpose is developed and updated	The database is available within the first year of the project	
		Performing the evaluation on 6 different agroecological zones starting from the first project year (4 localities, in each locality 2 control and 2 pilot farmers)	Data are regularly collected and digitized in the database	Data for 96 farmers (48 control and 48 pilots) are yearly collected according with the protocol and available in the database	
		Analyze data and prepare annual and final evaluation reports	Collected data are analyzed Annual and final reports are prepared	The reports are produced and available	

Component 5: Improvements in access to weather and climate information for women in agriculture					
Specific objectives	Activities (detail number and countries). Activities breakdown		Expected results	Evaluation indicators	Budget
Identify and develop cooperation agreements between NMHS, national stakeholders and women and youth organizations	Identify a National Focal Point institution and work together to raise a national plan to help rural women by adequate use of climate and weather information				
	Identify NGOs working with rural women and young farmers and develop partnerships.				
	Identify UN Organizations activities and projects with rural women, revision of their activities and making proposals for support them with weather and climate information				
Establish dialogue to ensure adequate participation of female and young farmers in Roving Seminars	Set up a multi-stakeholder mechanism bringing together relevant actors and partners				
	Identify barriers to women's participation and their specific needs in terms of weather and climate information, including preferred communication modes, languages, etc.				
Enhance the capacity of female	Develop a Roving Seminar model at community level that would be acceptable by	Propose pilot communities			

Component 5: Improvements in access to weather and climate information for women in agriculture					
Specific objectives	Activities (detail number and countries). Activities breakdown		Expected results	Evaluation indicators	Budget
and young farmers to use agro-climate information	men and women taking in account their traditional or present roles	Establish dialogue and agree on main gender roles			
		Propose a plan for Roving seminars and follow up activities for women and young farmers at pilot communities			
	Develop specific Seminars contents and training materials according to roles established				
	Identify right persons at NMHS and cooperating institutions to perform those Roving Seminars and provide training for them (mostly women)				
	Engage female participants in post-seminar activities, such as collection, recording and analysis of information (i.e. establish a 2-way communication channel b/n NMHSs and female users)				
Improve the access of women and young farmers to weather and climate information broadcasting	Revision of products and development of new specific ones				
	Mobile phones. Revision actual products and design new ones				

Component 5: Improvements in access to weather and climate information for women in agriculture				
Specific objectives	Activities (detail number and countries). Activities breakdown	Expected results	Evaluation indicators	Budget
<p>Enhance the capacity of NMHS staff to provide targeted information and services to female and young farmers</p>	<p>Provide awareness activities on gender for NMHS staff involved in service delivery with a focus on (a) the disadvantaged position of women in agriculture due to existing inequalities; (b) women’s role in agriculture and their potential contribution to improving met services; and (c) good practice in agromet services targeted at female farmers</p>			

Component 6: Weather and Climate Risk Management in Agriculture and Food Security					
Specific objectives	Activities (detail number and countries). Activities breakdown		Expected results	Evaluation indicators	Budget
To review climate and weather hazards that pose a risk for agriculture and propose adequate warning and forecasts products in coordination with IDMP, FFGS, SWFDP activities and WMO Regional Climate Centers developments and tools	Identify Weather and Climate Risks affecting agriculture and food production at country level at national level	<ul style="list-style-type: none"> • Review of previous reports including METAGRI OPS; • Validation of findings and update through a meeting with national partners and institutions; • Writing of a National report where those risks were identified and classified according their impacts in food production. 	Main agroclimate risks that affect agriculture are identified and classed by impact degree	<ul style="list-style-type: none"> • Report on regional status • Validated national reports after national meetings • Number and kind of institutions participating at the process 	
	Development of monitoring tools on weather and climate extremes with special focus in drought aspects at regional level and Flash Floods warnings to protect lives of fishermen, pastoralist/shepherds and their livestock	<ul style="list-style-type: none"> • RCCs listed available tools and products and identify needed improvements • SWFDP regional node provide models and develop warning, advisories and user guides • Review of drought indexes to be used in agriculture, bush/forest management, livestock or pastoralist and river/lake artisanal fisheries. Contribute to IDMP Regional project • NMHS provide Flash Flood warnings in areas where FFGS has been installed 	<p>Regional institutions provide guidance and support into monitoring weather and climate risks to the countries. SWFDP, RCCs and IDMP are strengthened.</p> <p>NMHSs provide timely warnings of Flash Floods to fishermen fishing in rivers and lakes and pastoralists/ shepherds</p>	<ul style="list-style-type: none"> • Report on Climate monitoring and warning tools • Report on Weather monitoring and warning tools • Report on drought monitoring and warning tools • Number of accurate warnings issued 	

Component 6: Weather and Climate Risk Management in Agriculture and Food Security					
Specific objectives	Activities (detail number and countries). Activities breakdown		Expected results	Evaluation indicators	Budget
Develop agreement protocols with Ministry of Agriculture and Civil Protection /Disaster Management to use those warnings and products under an Early Warning System and emergencies response plan, starting with a joint development or update of risks maps.	Institutional agreements. Enhanced GTPA. Drought management platforms. RCCs	<ul style="list-style-type: none"> • Revision of GTPA status at country level and report • Action plan to improve, revitalize or establish the multidisciplinary working group by national agreement • Define a sustainability plan for GTPA at long term 	A functional multidisciplinary working group is set up	<ul style="list-style-type: none"> • Number of working meeting held • Number of field mission conducted 	
	EWS build up (SWFDP, SAF NOWCASTING SPAIN, Sand and Dust. WMO)	<ul style="list-style-type: none"> • Development of weather reports, alert bulletins and reports of monitoring missions • Development of agricultural warnings based on SWFDP • Development of agricultural warnings based on Nowcasting SAF products • Development of sand and dust warnings advisories and alerts. • Development of climate alerts and advisories for sectors. Communicating and understanding uncertainty. 	The makers and users are regularly informed of the current status	<ul style="list-style-type: none"> • Warning number published 	
	Risk maps	<ul style="list-style-type: none"> • Regular production and update of risks maps by sectors; • Production of future risks maps based on climate scenarios; 	National and regional institutions make days and regularly provide risk maps on the whole area of intervention	<ul style="list-style-type: none"> • Number of present risk map • Risk maps based on future climate scenarios 	

Component 6: Weather and Climate Risk Management in Agriculture and Food Security					
Specific objectives	Activities (detail number and countries). Activities breakdown		Expected results	Evaluation indicators	Budget
Improved delivery and use of climate and weather warnings and advisories at farmer, fishermen and pastoralist level reducing losses and damages in different agricultural activities, including river and lake fisheries and cattle rearing	Development of response and recovery plans and risk transfer tools	<ul style="list-style-type: none"> • Support to contingency plans development by sectors with integrated approach • Support to transfer risk tools development with public and private sector • Training on the use of weather and climate warnings and advisories for decision makers and managers. Feedback from them. 	<p>Ownership approaches by stakeholders at national level</p> <p>Capacity building of actors</p> <p>Setting up committees coordination</p> <p>public and private partners involved in risk transfer tools development</p>	<ul style="list-style-type: none"> • Use of the tools at national level 	
	Development of impact assessment tools on extreme events	<ul style="list-style-type: none"> • Cooperation on the development of verifiable impact indicators by sectors • Setting thresholds for extreme weather and climate events according with verified impacts on sectors coordinated by regional centers • Capacity building of SHMNs to refine and improve monitoring and cooperation in impact assessment through sectorial fora 	<p>Development in regional centers of the appropriate tools to assess the impacts of extreme events</p> <p>National response plans are set according adjusted thresholds and reliable impact assessment tools</p>	<ul style="list-style-type: none"> • Extreme events thresholds set by countries • List of impact assessment methods and indicators by country and at regional level • National plans 	

Component 6: Weather and Climate Risk Management in Agriculture and Food Security				
Specific objectives	Activities (detail number and countries). Activities breakdown	Expected results	Evaluation indicators	Budget
	<p>Adding value to Food security decisions at national level</p> <ul style="list-style-type: none"> • Cooperation to improve information collection systems for food security. Defining products and advisories • Extreme events impacts on crops and other agricultural sectors. Loss and damages expected and evaluated post-facto 	<p>Quality information available to facilitate analysis and understanding of the situation on a regular basis (expected and analysis post-facto)</p>	<ul style="list-style-type: none"> • NMHS Regular participation at the food security survey and decision making national committees 	
	<p>Agreements with media and mobile phone companies for delivering warnings and advisories</p> <ul style="list-style-type: none"> • Establish MoUs between NMHSs, media and mobile telephony companies for the dissemination of agro-climatic risks (see component 3) 	<p>Through the agreement with established protocols, information on agro-climatic risks are regularly broadcasted to users</p>	<ul style="list-style-type: none"> • Increase in the number of users receiving warnings and advisories • High user satisfaction 	

Management: WMO Secretariat, Component managers and supporting staff					
Specific objectives	Activities		Expected results	Evaluation indicators	Budget
Project management at WMO Secretariat (Geneva and Regional Office)					
Components management and support staff					