

<b>PROJECT TITLE:</b>
<b>Development of early warning system for Farmer's preparedness against Climate change impacts in South-West Nigeria</b>
<b>THEMATIC AREA 12:</b>
An Agriculture and Food Security Research Project
<b>BACKGROUND TO THE RESEARCH:</b>
<p>Many of the farmers are peasants operating on extensive rain-fed agriculture and as such are always at the mercy of local weather conditions; which oftentimes are unpredictable and unfavorable. In many parts of South-western Nigeria where there are no irrigation facilities, farmers do not know when it is safe to commence planting, when the rains could be excessive and when a dry spell could be disastrous. Similarly, there are no decision supports to determine when outbreak of weather related pests and diseases could unleash economic injury to agricultural enterprises</p> <p>The unrestrained exposure of Nigerian agriculture to extremes of weather conditions will continue to constrain farmers' productive capacities and livelihoods; meanwhile, the impacts of climate change may not only threaten food but human and animal security. Amongst the many problems that constrain development of African agriculture, climate alteration has been identified to be significant and unless new paths are charted, food production and human security in Africa will be in jeopardy. With her present population, Nigeria has become the most vulnerable countries of Africa to insecurities arising from food shortages and the consequences of global environmental change.</p> <p>It is therefore thought that through development of early warning and effective dissemination of high quality climate information, Nigerian agriculture can survive vagaries of stressors confronting it. If farmers are encouraged to organize themselves into <b>climate information user groups</b> in <b>climate-smart villages</b> where necessary trainings are conducted and reliable and quality climate information are disseminated in near real-time, it is possible to overcome the monstrous challenge of climate-change and checkmate the associated ills of weather related agricultural disasters such as drought, flood, diseases, that comes with it.</p> <p>The project will train farmers on how to make effective use of the climate information available to them. This will be achieved through establishment of climate-smart villages where farmers are frequently instructed on how to access and interpret climate information and what to do with them. The project will reveal existing local and regional policies for climate change mitigation with emphasis on positive and negative impacts on the Farmers and the emerging innovations for livelihood adaptation as related to climate change. The project will provide scientific evidence for policy decision in ameliorating socio-political situation, increase unhindered access to climate information, suggest easily adoptable solutions to mitigate climate change impact, support livelihoods development and adaptations and a crucial task to support a transition to more sustainable agrarian societies. The project will strive to help farmers to improve on their means of livelihood by making most use of the climate information services provided to increase productivity, reduce loss and reduce poverty.</p>
<b>STATEMENT OF THE PROBLEM:</b>
<p>Lack of infrastructures for Climate Information Service (CIS) and Early Warning Systems (EWS) and adequate dissemination of warning signals exposes agriculture and people to high risks; granting less people access to good food, cleaner water and better means of livelihood. There are gross inadequacies or inaccurate seasonal climate predictions to the agrarian communities in Nigeria. This has limited farmers' capabilities to meet the food demand of millions of people; hampering efforts to improve food security and reduce poverty. Consequently it is urgent to bridge the gaps in Nigerian farmers' climate information needs through generation and effective dissemination of high quality climate information accompanied with models for reliable forecast where and when required.</p>
<b>AIM, GOAL &amp; OBJECTIVES OF THE RESEARCH:</b>
<p><i>Project aim:</i></p> <p>The project aim is to enhance farmers preparedness against climate change impacts and strengthen capacity for Agricultural disaster risk management in South-western Nigeria</p> <p><i>General Objective:</i></p> <p>The general objective of the project is develop an early warning systems comprising of generation and dissemination of climate related agricultural information in near real-time to small holder farmers</p> <p><i>Specific Objectives:</i></p> <ul style="list-style-type: none"> <li>i. Assess among other things the poverty, food insecurity situation as well as the climate information needs of 1440 selected farmers disaggregated into 864 men and 576 women across SW Nigeria</li> <li>ii. Establish ground receiving station connected to European Meteorological Satellite (Atlantic Bird 3) in</li> </ul>

- iii. SW geopolitical zone of Nigeria to acquire quality climate data.
- iv. Meteorological Analysis for sub-seasonal-to-seasonal (S2S) climate prediction
- v. Process the data in (i) above into reliable climate information and effect near real-time dissemination of the Information to the farmers
- v. Establish six Climate-smart villages in most climate-change impacted areas of SW States of Nigeria.
- vi. Develop training curriculum on Climate-smart farm practices for farmers through effective training on the Use of CIS and EWS tools
- vii. Develop policy briefs from the experience on the project and advocate policy formulation by governments
- viii. Establish the Climate research for Development (CR4D) platform that will bring scientists and climate change researchers together to move Africa forward

### **RESEARCH METHODOLOGY:**

The project implementation is divided into seven Work groups namely: 1: Baseline survey, needs assessment and project impact evaluation; 2: Climate data generation and dissemination; 3: Data analysis, Modeling and seasonal to sub seasonal climate prediction; 4: development of Agro-weather tools; 5: Climate-Smart Farming Education; 6: Climate Research for Development & Policy Advocacy and 7: Project Management. Each work group has set of Terms of reference/ objectives and deliverables which have been stated under the Work Group action plan.

Generally, the project will be executed in four phases by the seven work groups. First phase is the Needs assessment and baseline survey to be executed by Work group 1. The second is the generation of quality climate data to be handled by work groups 2 and 3. The third phase is effective dissemination of climate information to farmers to be jointly handled by Work groups 2 and 4. The fourth phase is the sustainability and exploratory plan which will be achieved by two means namely: creating the Policy advocacy group comprising of scientist, Civil Society Organizations (CSOs) /Non-Governmental Organizations (NGOs), Policy makers etc. as well as the Climate Research for Development platform comprising essentially of scientist CSOs and farmers finding scientific ways of enhancing resilience and mitigating climate change impacts in most effective way.

The farmers in the climate smart villages receiving training and using the climate information will be expected to draft other non-user farmers into the climate-smart villages and community of climate information users. To achieve this each beneficiary will be mandated to recruit at least 3 new members per year. If this continues for five years the population of climate-smart farmers would have increased to 116,000.

For an abstract of project methodologies check the Work Group action plan. Each group leaders are to submit details of how the group will achieve all set objectives

### **DETAILED WORKGROUP 1 ACTION PLAN**

<b>WORK GROUP:</b>	One
<b>SUMMARY OF ACTIVITY:</b>	Field Data Collection and Project Evaluation
<b>DATE:</b>	July 2020
<b>REFERENCE:</b>	NRF/103197_WG01/DCPE.1
<b>GROUP RESPONSIBILITY:</b>	Dr Elizabeth O. Oyedepo
<b>Surrogate Leadership:</b>	Dr (Mrs) O. A. Oso; Dr A.A. Adeola; Dr S.O. Adesanya & Dr M.T. Hassan
<b>CIRCULATION:</b>	All project work groups & Project monitoring officer

#### **BACKGROUND**

The essence of work group 1 is to provide information that will help in gaining comprehensive understanding of the smallholder farmers' challenges with respect to climate change impacts on their livelihoods, climate information needs, training needs and the best strategies for deploying interventions. The key element of the work group is therefore to collect relevant socio-economic data and climate impact information that will aid the development of a warning system to prepare the farmers prepare against climate change impact and aid right management decisions making for improving and sustaining production and livelihoods. This will exercise will also include climate information service and training needs assessment and periodic evaluation of progress made with the intervention as well as the project impact on the people.

## **WORK GROUP OBJECTIVES:**

*This work package will focus on the following key objectives:*

1. Identify 1,440 small holder farmers, obtain their socio-economic data and create inventory
2. Carry out baseline survey climate information/training needs assessment.
3. Conduct target-beneficiary analysis from the baseline data obtained
4. Evaluate the periodic project effects/impacts
5. Supply information (briefs) for policy advocacy group based on inference from objective 4

## **DESCRIPTION OF WORK AND WORK ELEMENT OUTPUTS**

### **1. INPUT** (*inputs from other groups and research elements that will aid the success of this Work Group*)

- Information from the Principal investigator and the M&E for design of survey instruments
- Information from work group 5 on the required training assessment to conduct
- Information from work group 5 on the required data for policy briefs

### **2. OUTPUT** (*Resulting outputs to be achieved in this Work Group*)

- Design of survey instruments for (interview guides, FGDs, KIIs, WEAI etc.)
- Trained enumerators with pre-loaded Android tablets or hard copies of survey instruments
- Collated data from survey of 1440 smallholder farmers in 72 villages (12 LGAs of the 6 States)
- Farmers inventory including phone contacts etc
- Delivery of database and presentation of progress report to M&E
- Delivery of result for work group 2 and 3
- Delivery of coordinates of respondents, villages, identified site for six demonstration plots and 6 C-smart viewing centres (climate-smart villages) in the 6 states
- Report and updates of periodic project Evaluation

### **3. KEY WORK ELEMENTS** (*Breakdown of tasks*)

- Pre-survey meeting with the State ADPs and local farmers in the 6 States
- Design of and test of survey instruments
- Train field workers in survey data collection APP use
- Socio-economic baseline data (survey) of smallholder farmers including current challenges
- Assessments of smallholder farmers on Climate Information Service (CIS)/advisory service needs
- Assessment of smallholder farmers on CIS use and agricultural practice training needs
- Establishment of the first set of climate-smart farmers (1440), climate-smart village
- Creation of database for the C-Smart farmers and update of the register with new entrants
- Periodic project evaluation
- Conclusion of Report writing
- Periodic presentation progress report and Final project report

*The leader of this group could look through the suggested methodologies for the field work. The group is however, free to use another technic provided the overall objectives are met*

### **Methodology for the baseline exercise**

#### **Scope of the Survey:**

The survey will draw samples for data collection from all project selected local government areas in the six states of SW Nigeria. The study will be conducted in four local governments purposively selected from Ekiti, Lagos, Ogun, Ondo, Osun and Oyo States. The study will involve rural farming household survey

#### **Aims of the Survey:**

1. To collect, analyse and report baseline data that can serve as basis for comparison of project impact in future.
2. To have a means of assessing the climate information needs of the people, the dynamics of climate variability in southwest and to conduct a kind of Political Economy Analysis for the EWS project.
3. To provide answers to knowledge gaps awaiting outcomes of scientific research. For instance, what are the real drivers of climate change? Are existing climate services effective or not? If otherwise, why and what is responsible for the failures? What are the climate information needs of specific users? Are there enough climate information? Can we set up Early Warning System at local levels? How best can Climate Information service (CIS) be incorporated into Climate-smart Agriculture (CSA) to engender resilience and meet the key Sustainable Development Goals (SDGs)? These and more awaits answers. estimates

#### **Sampling method and Sample Size determination:**

Four (4) Local Governments Areas (LGAs) with the highest record of climate induced stress will be purposively selected in each State based on the advice of the State Agricultural Development Projects (ADPs). In each selected LGA, three (3) communities will be randomly selected and in each community, twenty (20) farming families will be selected.

The sample size of 1400 respondents determined using the USAID, sample size determinant table. With a population range of 10 to 100 million people, at 99% confidence level and error margin of 3.5%, the sample size of 1,354 is recommended (Research advisors, 2006). The proposal therefore goes for a sample size of 1,440 respondents which for gender inclusiveness, will be disaggregated into 576 male and 865 female farmers. At community level 12 male and 8 female farmers will be interviewed respectively. Data collection will be conducted by enumerators who would be trained.

### **Survey Instruments**

For the purpose of comprehensive baseline data, both quantitative and qualitative data collection should be carried out. The two sets of data (Quantitative, Qualitative) will be collected including Key Informant Interviews (KII), Focus Group Discussions (FGDs) and Women Empowerment in Agriculture Index (WEAI). The quantitative data will be collected using structured close-ended questionnaire/interview guides (questionnaires) to elicit vital information from the 1,440 respondents.

For qualitative assessments, 6 Focus Group Discussions (FGDs) and 24 Key Informant Interviews (KII) as well as 60 Women Empowerment in Agriculture Interviews should be done by survey supervisors.

**Clue on the field exercise:** The 1,440 respondents could be divided amongst 10 enumerators that will be selected and trained for the assignment. This portends that one enumerator could handle 144 respondents in 10 days at the data capture rate of 6 to 8 respondents per day. To allow for ease of data collection, mobile based data collection app such as ODK survey will be used to design the survey instruments which will be uploaded to android devices such as the mobile phones and tablets. 10 of the android devices will be provided alongside paper copy of the survey instruments.

### **EQUIPMENT AND FACILITY REQUIREMENTS**

- Laptops computers (1 unit)
- Camcorder (1 unit)
- GPS enabled Android Tablets (10 units)
- Smart phones for each community (72 units)
- Hand held GPS devices (1 units)
- GPS-enabled Android Tablets
- Stationeries and printing facilities
- Hilux pick-up vehicle
- Sundry project pack with a hand bag
- Personal Protective Equipment (ventilators and hand sanitizers etc.)

*Leaders should list out and make a request for items not listed. Direct your request to the PI through the M&E*

**SUMMARY OF KEY DELIVERABLES:** (breakdown WP deliverable elements with due dates. Group leaders could allocate responsibilities to members of the work group)

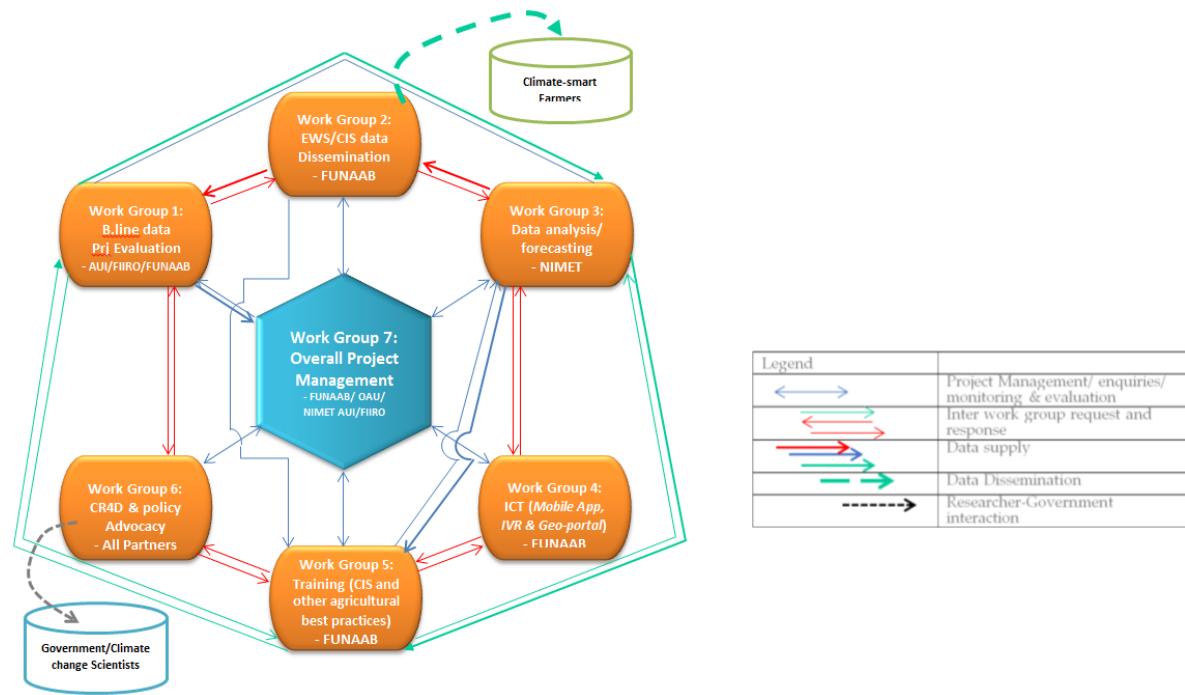
REF	DESCRIPTION	RESPONSIBLE	DUE DA
D1.1	Identification of villages and farmers from meetings with ADPs	Dr E.O. Oyedepo	
D1.2	Survey instruments for (interview guides, FGDs, KII, WEAI etc.)		
D1.3	Collated data/Report of socio economic survey		
D1.4	Delivery of result for work group 2 and 3		
D1.5	coordinates of villages demo plots and c-smart centres to WG2		
D1.6	Report of periodic project Evaluation		
D1.7	Periodic report updates on evaluation		
D1.8	Submission of manuscript of academic article(s) for publication		

*Leader of group 1 must keep this as a reminder in the group activity*

Key task	Out put	Indicators
Baseline survey of selected farmers from 72 communities in SW Nigeria with the aim of gathering needs assessment for Early warning and Climate information services.	Report on the people and vulnerabilities CIS needs Report on the type of existing interventions	- Farmers register, - Demonstration plots - Farmers information centre - Farmers' Electronic database - Agric information tracks

## DEPENDENCIES

(This diagram shows you the work group that rely on information from your work group and those that you rely on for information. It may be updated as necessary as the project progresses.)



Schema of interdependencies of the partner groups

## ITEMS THAT MUST BE AVAILABLE FOR THIS WORK GROUP

*These are inputs from other work groups to aid your work*

INPUTS FROM OTHER PARTNER GROUPS	RESPONSIBLE	Phone
M&E brief on work/data standard for projects	Dr. A.M. Taiwo	0803-489-8675
Equipment and Facility supply	Mr A.S. Fadeyi	0803-418-5240
Brief on field data required for work group 2	Mr D. Oluyege/E. Babajide	08132568095 / 0809643410
Brief on field data required for work group 3	Dr K.A. lawal	0708-780-3764
Brief on field data required for work group 4	Prof O. Folorunso	0803-564-0707
Brief on field data required for work group 5	Dr G.A. Ajiboye	0813-723-0306
Brief on field data required for work group 6	Prof. O.I. Orimogunje	0803-585-5946
General clarifications on project goals, objectives etc.	Dr J.A. Oyedepo	0803-248-5583

## WORK GROUPS DEPENDING ON THIS WORK GROUP

*Note that other work groups will rely on the outcome of your group's activities for success*

WORK GROUPS	RESPONSIBLE
Work group 7: Project Management	Dr J.A. Oyedepo
Work group 2: Climate data generation and dissemination	Mr D. Oluyege/E. Babajide
Work group 3: Data analysis, Modelling and Forecast	Dr K.A. lawal
Work group 4: ICT (Agro-weather tools)	Prof O. Folorunso
Work group 5: Climate-Smart Farming Education	Dr G.A. Ajiboye
Work group 6: Climate Research for Dev't & Policy Advocacy	Prof. O.I. Orimogunje
General clarifications on the project goals, objectives etc	

## SUMMARY OF MILESTONES

(Leaders should kindly complete the date and cost expended to reach each milestones)

REF	DESCRIPTION	DUE DATE	MILESTONE COST
M1.1	Identification of villages/ farmers from meetings with ADPs		
M1.2	Collated data/baseline survey and needs assessment report		
M1.3	Delivery of result for work group 2 and 3		
M1.4	Progress report		
M1.5	Report of project Evaluation		
M1.6	Final project report for WG1		
M1.7	Publication of article(s) in high impact factor journal		

## GROUP TIME LINE AND ACTIVITY PLAN

Leader should meet with group members to prepare the approach they will use in achieving the objectives of this group including timeline of activities. This would be submitted as separate document to project management before funds would be released.

## FINANCIAL REPORT

At the end of the project the group leader will prepare a financial profile which would also be submitted as a separate document to the project management group. This is crucial to the release of the final tranche.

(All advances must be retired with authentic receipts)

## WORKGROUP 2

### WORK GROUP:

Two

### SUMMARY OF ACTIVITY:

Platform for EWS (Climate Data Generation and Dissemination)

### DATE:

July 2020

### REFERENCE:

NRF/103197\_WG02/PCD.2

### GROUP RESPONSIBILITY:

Dr J. A. Oyedepo;

### Surrogate Leadership:

Dr A. Kabobah; Dr K.A. Lawal; Mr D.E. Oluyege & Mr E.I. Babajide

### CIRCULATION:

All project work groups & Project monitoring officer

### BACKGROUND:

The essence of work group 2 is to establish the infrastructure for continuous access to reliable climate and environmental data and disseminate same to the farmers who are the direct target beneficiaries of the intervention. The group will therefore establish an early warning system that is based on data accessed from European Meteorological Satellite (Atlantic Bird 3) that will be rebroadcast to the farmers through various means like internet radio, SMS, and Mobile App on smart phones. The group will also establish climate-smart villages with fully equipped viewing centres in six villages across the SW.

### WORK GROUP OBJECTIVES:

This work package will focus on the following key objectives:

1. Establish Climate Information Service/Early Warning System infrastructures to generate quality data
2. Establish Climate-smart villages in six states of SW Nigeria equipped with training facilities.
3. Disseminate climate data via effective means such as mobile phone Apps, electronic & print media.
4. Provide for 2-way interaction with farmers (using IVR to receive & address farmers' concerns)

### DESCRIPTION OF WORK AND WORK ELEMENT OUTPUTS

#### 1. INPUT (inputs from other groups and research elements that will aid the success of this Work Group)

- Information from the WG 7 and M&E work standards and measurable outputs
- Information from work group 1 on the characteristics of the farmers their location and CIS needs
- Information from work group 3 on format of forecasting & how it can be integrated on the EWS

**2. OUTPUT** (*Resulting outputs to be achieved in this Work Group*)

- EUMETSAT/Geonetcast-based CIS /EWS
- Automated climate data dissemination to farmers
- Established Climate-smart villages in six locations accessible to farmers
- Solution providing interactive platforms for farmers
- Integration of Agro-weather tools to the CIS/EWS platform

**3. KEY WORK ELEMENTS** (*Breakdown of tasks*)

- Establishment of Geonetcast station in FUNAAB
- Automation of GIS weather map production from the downloads on GEONETCAST
- Design of Geo-portal to integrate NIMET weather forecast (output of Work Group 2) with the mobile Apps and Agro-weather tool products from ICT (Output of work group 4)
- Development of internet radio and TV station
- Development of end user manuals to be handed over to Climate-smart Education (Work Group 5) on the use of the climate information service data and App. Especially on how to access and utilise the CI on the farm.
- Assessments of smallholder farmers on Climate Information Service (CIS)/advisory service needs
- Establish training and viewing centres in the c-smart villages.
- Test-run the CIS and EWS platform through the C-Smart village farmers.
- Conclusion of Report writing
- Periodic presentation progress report and Final project report
- Scientific journal articles

**EQUIPMENT AND FACILITY REQUIREMENTS**

1. Laptops computers (2 units: receiving and processing station)
2. Computer server
3. Solar power
4. Internet subscription
5. C-Band antennae (3.8 meter dish, 10 BUC, Digital, LNB)
6. Signal Booster, signal detector
7. Coaxial cable
8. Air-conditioners
9. Desks and Chairs
10. Hilux pick-up van
11. Sundry project pack with a hand bag
12. Personal Protective Equipment (ventilators and hand sanitizers etc.)

*Please leaders should list out and make a request for items not listed. Direct your request to the PI through the M&E*

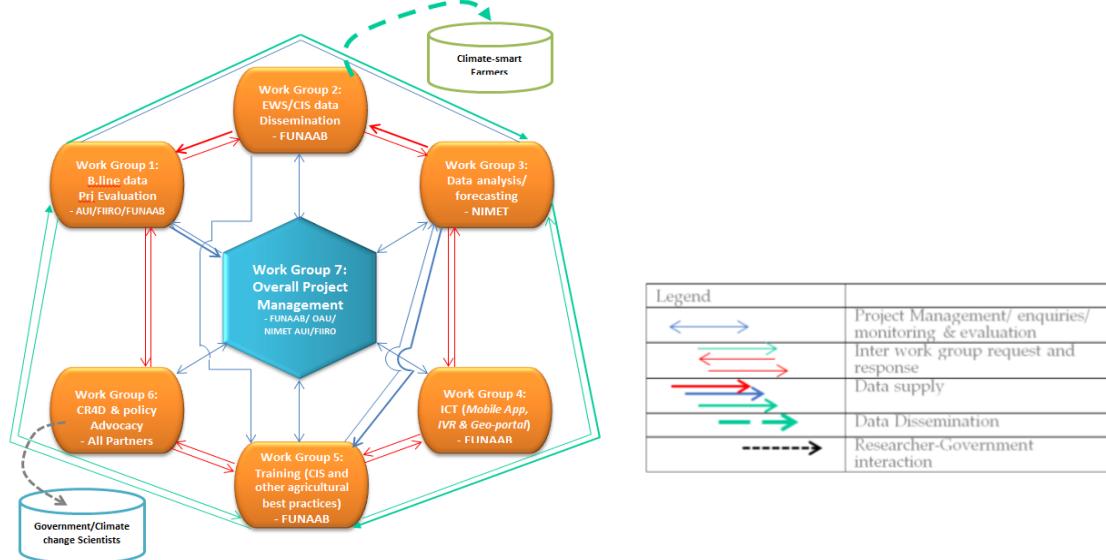
**SUMMARY OF KEY DELIVERABLES:**

(*Breakdown WG deliverable elements with due dates. Group leaders could allocate responsibilities to members of the work group*)

REF	DESCRIPTION	RESPONSIBLE	DUE DATE
D1.1	EWS platform running on Geo-net-cast and NIMET		
D1.2	Internet Media (Radio and TV)		
D1.3	Climate-smart village centres		
D1.4	Report of periodic project Evaluation		
D1.5	Periodic report updates on evaluation		
D1.6	Submission of manuscript of academic article(s) for publication		
D1.7	Final report writing		

## DEPENDENCIES

(This diagram shows you the work group that rely on information from your work group and those that you rely on for information. It may be updated as necessary as the project progresses.)



Schema of interdependencies of the partner groups

## ITEMS THAT MUST BE AVAILABLE FOR THIS WORK GROUP

This represents support your group require from other groups; the information will guide your group's actions

INPUTS FROM OTHER GROUPS	RESPONSIBLE	Phone
M&E briefing on work / data standard	Dr. A.M. Taiwo	0803-489-8675
Equipment and Facility supply	Mr A.S. Fadeyi	0803-418-5240
Brief on requirements by Work group 1	Dr E.O. Oyedepo	0803-864-8941
Brief on requirements by work group 3	Dr K.A. lawal	0708-780-3764
Brief on requirements by work group 4	Prof O. Folorunso	0803-564-0707
Brief on requirements by work group 5	Dr G.A. Ajiboye	0813-723-0306

## WORK GROUPS DEPENDING ON THIS WORK GROUP

Kindly note that other groups depend on the outcome of your activities to make progress in their respective group works

WORK GROUPS	RESPONSIBLE	DUE DATE
Work group 7: Project Management	Dr J.A. Oyedepo	
Work group 3: Data analysis, Modelling and Forecast	Dr K.A. lawal	
Work group 4: ICT (Agro-weather tools)	Prof O. Folorunso	
Work group 5: Climate-Smart Farming Education	Dr G.A. Ajiboye	
Work group 6: Climate Research for Dev't & Policy Advocacy	Prof. O.I. Orimogunje	
General clarifications on the project goals, objectives etc		

## SUMMARY OF MILESTONES

REF	DESCRIPTION	DUE DATE	COST TO MILESTONE
M2.1	Establishment of Geo-net cast EWS platform		
M2.2	Establishment of Climate-smart information centres		
M2.3	Integration of products from Work groups 2, 3 and 4		
M2.4	Report on test-running of the infrastructures		
M2.5	Successful dissemination of information to farmers		
M2.6	Report of project Evaluation		
M2.7	Final project report for WG1		
M2.8	Publication of article(s) in high impact factor journal		

*The group leader should take note of the following table it will be useful as a guide in the group work*

TASK	OUTPUTS	INDICATORS
• Early Warning System infrastructures in 6 centres in SW (Nigeria)	• Functional climate data generating and disseminating stations • C-smart centres for interaction of climate-smart farmers • Dynamic point of access to all C-smart farmers through smart phones, tele-conferencing & Web-based interactions	• Progress report • EWS/CIS infrastructures • Web-Based Geo-portal • Up and running mobile App • Internet radio & SMS service
• Climate Information Systems (CIS) for target beneficiaries		
• C-smart villages; principles & practice of C-smart smart Agriculture	• Climate-smart villages in four States • Entrenched operation of the villages on climate-Smart Agriculture principles	• Progress report • Demonstration plots • C-Smart villages & practices
• 5. Dissemination of reliable climate information from processed and analysed raw climatic data.	• Better decision on planting calendars by farmers • Informed decision on how to tackle weather induced agricultural disasters (drought, flood, pest & diseases etc. • Readily available fodder for livestock and food for man	• Reports on Adoption and utilization rates of CIS • Reports on the effects of CIS from assessment report

### GROUP TIME LINE AND ACTIVITY PLAN

*Leader should meet with group members to prepare the approach they will use in achieving the objectives of this group including timeline of activities. This would be submitted as separate document to project management before any fund release.*

### FINANCIAL REPORT (All advances must be retired with authentic receipts)

At the end, the group leader will prepare a financial profile to be submitted as a separate document to the project management group. This is crucial to the release of the final tranche.

## WORKGROUP 3

### WORK GROUP:

Three

### SUMMARY OF ACTIVITY:

Analysis & Sub-seasonal-to-seasonal (S2S) Climate Prediction/ Forecast

### DATE:

July 2020

### REFERENCE:

NRF/103197\_WG03/SCP.3

### GROUP RESPONSIBILITY:

Dr K.A. Lawal;

### Surrogate Leadership:

Dr E. Olaniyan;

### BACKGROUND

The essence of work group 1 is to provide first hand analysis of meteorological data to provide for sub-seasonal-to-seasonal (S2S) climate prediction. The data analysis and sub-seasonal-to-seasonal (S2S) climate prediction will be done through computer programming. The group will rely on the use of Python script writing for near real-time running of more than 100 ensemble member S2S weather forecast. Amalgamation of C++, Ferret and Fortran scripts will be done for downscaling of S2S weather forecast to daily timescales (46 days in advance) and weekly updates

### WORK PACKAGE OBJECTIVES:

This work package will focus on the following key objectives:

1. Subscribe to both historical and recurrent NIMET data
2. Analyse the data to provide results for sub-seasonal-to-seasonal (S2S) climate prediction
3. Turn in the predictions in map form that is compatible with the CIS /EWS platform.
4. Automate the data analysis programme for continuous dissemination to selected farmers
5. Carry out periodic evaluation of the climate prediction facility
6. Supply information that can be used for policy formulation and advocacy
7. Write articles for high impact factor journal

### DESCRIPTION OF WORK AND WORK ELEMENT OUTPUTS

#### 1. INPUT (inputs from other groups and research elements that will aid the success of this Work Group)

- Briefing from the Principal investigator and the M&E for design of survey instruments
- Briefing from work group 1 on the characteristics climate prediction needs of target farmers
- Briefing from work group 2 on the requirements for the prediction to run on the EWS platform
- Briefing from work group 4 on how the predictions can work with agro-weather tools
- Briefing from work group 6 on the required information for policy briefs

#### 2. OUTPUT (Resulting outputs to be achieved in this Work Group)

- NIMET data subscription
- sub-seasonal-to-seasonal (S2S) climate prediction
- integration of result with work group 2
- Report and updates of periodic project Evaluation

### 3. KEY WORK ELEMENTS (*Breakdown of tasks*)

- Python script writing for near real-time running of more than 100 ensemble member S2S weather forecast
- Amalgamation of C++, Ferret and Fortran scripts for downscaling of S2S weather forecast to daily timescales (46 days in advance) and weekly updates Pre-survey meeting with the State ADPs and local farmers in the 6 States
- Periodic project evaluation
- Conclusion of Report writing
- Periodic presentation progress report and Final project report

### EQUIPMENT AND FACILITY REQUIREMENTS

1. Stationeries and printing facilities
2. Sundry project pack with a hand bag
3. Personal Protective Equipment (ventilators and hand sanitizers etc.)

*Leaders may list out and make a request for items required but not listed here from the PI through the M&E*

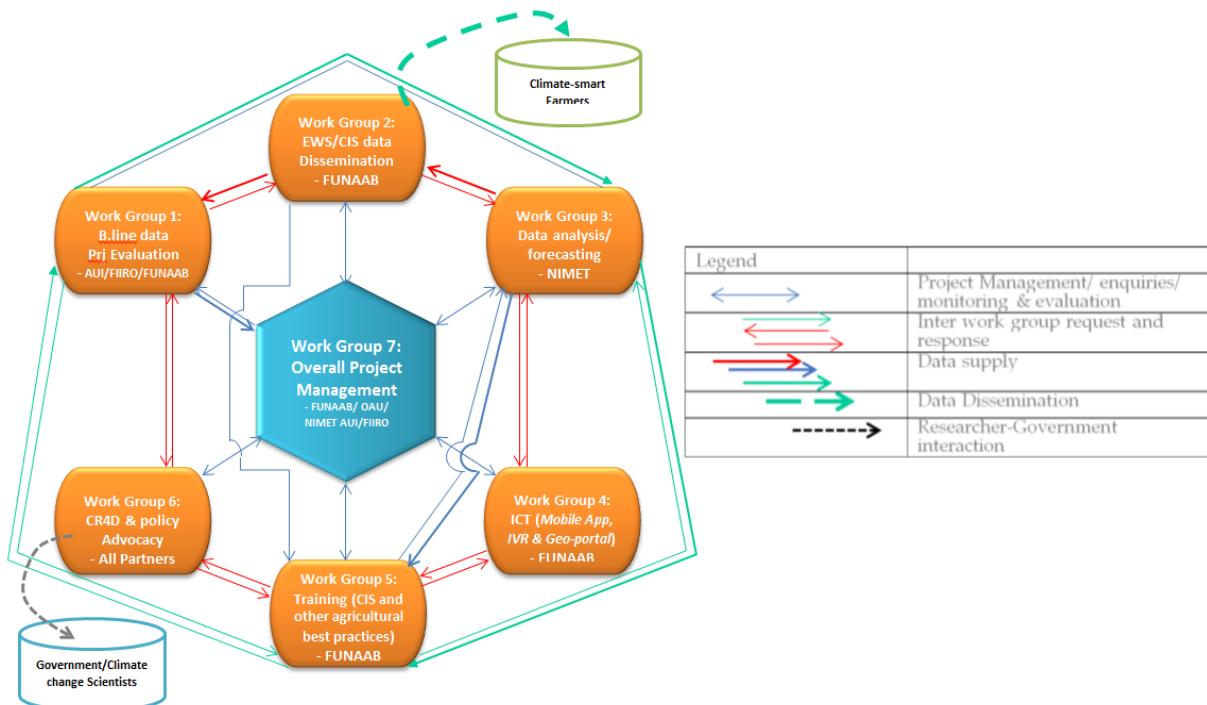
### SUMMARY OF KEY DELIVERABLES: *Breakdown WG deliverable elements with due dates.*

*(Group leaders could allocate responsibilities to members of the work group)*

REF	DESCRIPTION	RESPONSIBLE	DUE DATE
D3.1	S2S climate prediction		
D3.2	Periodic report updates on evaluation		
D3.3	Final report writing		
D3.4	NIMET historical data		

### DEPENDENCIES

*(This diagram shows you the work group that rely on information from your work group and those that you rely on for information. It may be updated as necessary as the project progresses.)*



*Schema of interdependencies of the partner groups*

### ITEMS THAT MUST BE AVAILABLE FOR THIS WORK GROUP

*This represents support your group require from other groups; the information will guide your group's actions*

WORK GROUP	RESPONSIBLE	Phone
M&E briefings on work and data standard	Dr. A.M. Taiwo	0803-489-8675
Equipment and Facility supply	Mr A.S. Fadeyi	0803-418-5240
Brief on required for work group 2	Mr D. Oluyege/E. Babajide	08132568095 / 08096434106
Brief on field data required for work group 4	Prof O. Folorunso	0803-564-0707
Brief on field data required for work group 5	Dr G.A. Ajiboye	0813-723-0306
Brief on field data required for work group 6	Prof. O.I. Orimogunje	0803-585-5946

### WORK GROUPS DEPENDING ON THIS WORK GROUP

*Kindly note that other groups depend on the outcome of your activities to make progress in their respective group works*

WORK GROUP	RESPONSIBLE	DUE DATE
Work group 7: Project Management	Dr J.A. Oyedepo	
Work group 2: Climate data generation and dissemination	Mr D. Oluyege/E. Babajide	
Work group 4: ICT (Agro-weather tools)	Prof O. Folorunso	
Work group 5: Climate-Smart Farming Education	Dr G.A. Ajiboye	
Work group 6: Climate Research for Dev't & Policy Advocacy	Prof. O.I. Orimogunje	

### SUMMARY OF MILESTONES

*(Leaders should kindly complete the date and cost expended to reach each milestones)*

REF	DESCRIPTION	DUE DATE	MILESTONE COST
	Identification of villages and farmers from meetings with ADPs		
	Collated data/Report of baseline socio economic survey and needs assessment		
	Delivery of result for work group 2 and 3		
	Progress report		
	Report of project Evaluation		
	Final project report for WG1		
	Publication of article(s) in high impact factor journal		

### GROUP TIME LINE AND ACTIVITY PLAN

*Leader should meet with group members to prepare the approach they will use in achieving the objectives of this group including timeline of activities. This would be submitted as separate document to project management before funds would be released.*

### FINANCIAL REPORT

At the end of the project the group leader will prepare a financial profile which would also be submitted as a separate document to the project management group. This is crucial to the release of the final tranche. *(All advances must be retired with authentic receipts)*

## WORKGROUP 4

<b>WORK GROUP:</b>	Four
<b>SUMMARY OF ACTIVITY:</b>	ICT and Artificial Intelligence for Agro-Weather Tools
<b>DATE:</b>	July 2020
<b>REFERENCE:</b>	NRF/103197_WG04/ICAIT.4
<b>GROUP RESPONSIBILITY:</b>	Professor O.O. Folorunso;
<b>Surrogate Leaderships:</b>	Mr V.O. Opakunle; Mr O.C. Akinola;

### BACKGROUND

The essence of work group 1 is to enhance the project's overall ability to effectively disseminate climate information to the farmers in good time. The dissemination will be effected through a combination of two modes namely: contact and distance interactions. The contact mode is through the climate-smart villages where advisory service staff can reach the farmers. The non-contact interaction will be via short message services or direct calls on smart phones; other means is through internet facilities such as websites and internet-radio. There are however digital bridges to cross to reach this ends. The key work elements of this group will therefore include creation of web-based geo-portal to house the climate information from the communication satellites; programming to automate data mining from the downloaded climate data into useful formats; development of a mobile App that will permit the farmers access the data on the EWS platform; subscription to Inverse Voice Response App that removes language gap where farmers wishes to relay their concerns to the project headquarters. The work group will also help design an internet radio for constant airing of advisory services particularly for weather forecasts for agriculture.

### WORK PACKAGE OBJECTIVES:

This work package will focus on the following key objectives:

1. Create a data archival system
2. Create a data mining system
3. Develop effective dissemination tools (agro-weather tools)

### DESCRIPTION OF WORK AND WORK ELEMENT OUTPUTS

#### 1. INPUT (*inputs from other groups and research elements that will aid the success of this Work Group*)

- Briefing from the Principal investigator and the M&E
- Briefing from work group 1 on the characteristics climate prediction needs of target farmers
- Briefing from work group 2 on the requirements for the prediction to run on the EWS platform
- Briefing from work group 4 on how the predictions can work with agro-weather tools
- Briefing from work group 6 on the required information for policy briefs

#### 2. OUTPUT (*Resulting outputs to be achieved in this Work Group*)

- NIMET data subscription
- sub-seasonal-to-seasonal (S2S) climate prediction
- integration of result with work group 2
- Report and updates of periodic project Evaluation

### KEY WORK ELEMENTS (*Breakdown of tasks*)

(*The Leader is free to assign tasks to members and co-opt consultants provided the cost is within the budget limit*)

- Automation of data mining from downloaded satellite derived meteorological data
- Development of a mobile App for farmers to access the data on the EWS platform;
- Inverse Voice Response App to remove language barrier in farmers' search for climate information.
- Design an internet radio for constant airing of advisory services
- Periodic project evaluation
- Conclusion of Report writing
- Periodic presentation progress report and Final project report

**Attention: The work group may find the write-up below useful in providing clearer picture of the task**

#### Data mining or extraction

Satellite-derived climate data are available in different formats, it is sometimes necessary to extract and put them in the same format that will be useful for a people-centered warning system. The acquired data are often in image format (jpeg or tiff etc.) they

are first downloaded (as is) from source into a central computer storage device from where they can be retrieved by a GIS software for further processing and eventual migration to the Geo-portal or data ware house (data storage system). The GIS software runs on python scripts to perform different tasks. For instance, it can extract values of pixels on the image (.jpeg or .tiff) as a set of points (tuples) with x, y and z (z is the value of the parameter) while x and y depict the geographic location of that parameter. These set of points can be further processed by kriging or other interpolation techniques to produce a spatial map of the distribution of the parameter. By loading the coordinates of registered farms on these parameter maps, current situations can be understood. Similarly, with spatial maps of forecast overlaid with coordinates of farms warnings and advices can be issued.

#### **Data ware housing and Archiving**

Having extracted the necessary data, it will also be necessary to structure them for querying, retrieval and use. Thus a geo-database will be created for all acquired and mined data in such a way to permit querying updates, modification and rapid retrieval. As such, all Satellite-derived data will be stored up in a Geo-database. This will be made possible with the aid of cloud computing where our storage system is too small for this. Please note that data download once we are connected with EUMETSAT/GEONETCAST is too enormous for our archival system on 9 terabyte Hard disk drive. This where the Geo-portal becomes vital. The data will be stored up as PNG format maps, PDF files, MS-word documents, MS-Excel sheets, ESRI shape files. Since the data are supposed to be placed on-line for a long term, and often data can reach a state where all modification are final and all expected reference uses have been accomplished at this 'inactive' state, they are usually moved into a partition where they are not directly accessible to the operating software but can be downloaded at will when the need arises. Accordingly it will be necessary to create an archive where older data can be moved to and retained both on the cloud and on the hardware. This will give room for comparison of new information with older ones while also aiding possibility of forecasting based on previous knowledge from historical data.

#### **Development of the Web-based Geo-portal**

Since the Early Warning being developed would be people-centered, it will be necessary to incorporate the software (including an expert system) into a web-based Geo portal with capabilities of storing up highly useful information on agriculture and providing rapid access to data, information, documents and tools that can support agricultural decision making.

The portal provides an entry point to access Agricultural information and services compiled in the Federal University of Agriculture Abeokuta, to support Agricultural production in SW Nigeria. Invariably, the portal becomes the hub for the people-centred Early Warning System for Agricultural Disaster. Apart from providing access to important national agricultural data sets such as high resolution maps on soil climate, demography, infrastructures etc. it will also give room for feedback and establishment of a strong network of stakeholders and people who are willing to fight food insecurity in south western Nigeria. The portal also makes available dynamic web pages with interactive maps and modeling or simulations tools for decision support. The portal connects to a system of existing web pages that provides opportunity to download data and maps necessary for decision making in agricultural practice. It consists of some add-ons that can allow simple data analysis, weather forecasting and prediction of likelihood of occurrence of events such as disease spread, drought, excessive rainfall, and agricultural pest invasion.

#### **Agro-weather Tools for Adapting to Climate Change**

The project will latch on to the growing affordability of smart phones and mobile phones, to spread of information to farmers. In conjunction with data obtained from the local meteorological stations of each participating states, local data for decision support will be created and placed on a web-based geo-portal which will be accessible to farmers through special applications (Apps) on the mobile handsets. Moreover, in future the system may have interactive voice response (IVR) systems that dynamically render weather conditions into human speech using pre-recorded sentences in native dialects and accents; these will be incorporated through Smart phones specifically customized for climate information services. The customized Smart phones will also be a good platform for survey tools to capture farmer needs and feedback. Radio and television messages will be employed to disseminate weather forecasts as well as more qualitative information related to planning for weather events to farmers who will have access to these through the viewing centers in the climate smart villages.

#### **Effective dissemination of climate information for resilience to climate impacts**

##### ***Dissemination by communication***

The communication approach will require establishment of an online platform from which the farmers can assess the information or have the information sent to them. The pedestal for this is through the Web-based Geo-portal.

##### ***The Geo-portal***

The Geo portal is constructed to grant the end user access to spatial information placed online. The project will create additional web pages named Early Warning for Agricultural Disasters (EWAD) on the existing University domain. The spatial data infrastructure on the Geo-portal will be strengthened using ArcGIS online. The information on the facility will be accessible to farmers through internet radio stations and the mobile App that can be downloaded from Google play store. The App will enable the user find any climate information desired. Since the Geo-portal will be updated constantly with climate information and warning signals, farmers will be able to take decision at any time of the year.

The 1440 farmers enumerated during the baseline survey shall be adopted as the foundation target beneficiaries who will be captured into a GIS database with their attributes and contacts including farm size, locations, climate constraints, climate information needs and registered phone numbers. These will receive weather information and other agriculture related advises

through short message service. They will be encouraged to acquire an android mobile phone on which they can download the Climate-smart App. The climate smart App will have 24 hours unhindered access to weather information on the web based Geo-portal. They could also send SMS to request for information to a dedicated service line.

#### *Climate Smart Villages*

The second approach is the Contact approach which will require establishment of four Climate-smart villages to gives farmers the opportunities for face to face interaction with the facilitators of the climate information service. The C-Smart villages will offer training opportunities on how to access and utilize the climate information to address climate induces agricultural risks and challenges. The Farmers will be assisted to form organized groups otherwise regarded as climate-smart farmers; which will make it easy for periodic training and advice. The climate smart villages will be equipped with viewing centers and other aids that will enhance climate information dissemination. The centers will be furnished with specialized equipment connected directly to the ground receiving stations at the cities from where uninterrupted information will be transmitted in real time to farmers. The farmers will be able to gather and meet with other stakeholders in climate change in agriculture for fruitful interactive sessions. Evaluation of the impact of the project will also find the climate smart villages very useful.

#### EQUIPMENT AND FACILITY REQUIREMENTS

1. Mini Lap-top
2. Sundry project pack with a hand bag
3. Personal Protective Equipment (ventilators and hand sanitizers etc.)
4. Stationeries and printing facilities

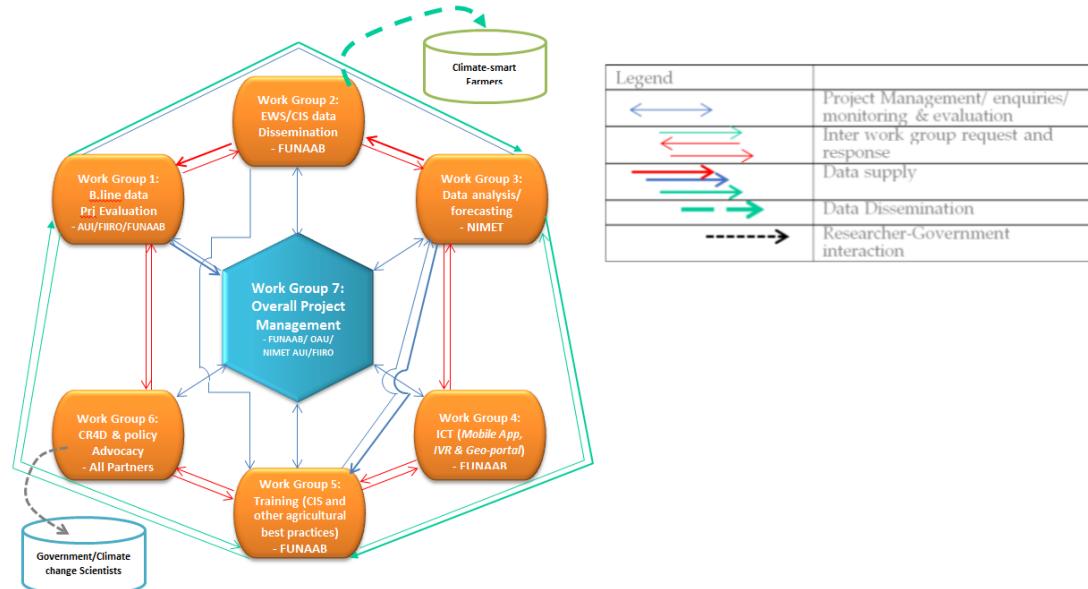
*Leaders may add to the list and justify the request for each items from the PI through the M&E desk*

#### SUMMARY OF KEY DELIVERABLES:

REF	DESCRIPTION	RESPONSIBLE	DUE DATE
D5.1	Geo-portal		
D5.2	Automated data mining and dissemination		
D5.3	Mobile App for end users on smart phones		
D5.4	Internet radio station		
D5.5	English <> Yoruba Inverse subscription for Voice Response (IVR)		

#### DEPENDENCIES

*(This diagram shows you the work group that relies on information from your work group and those that you rely on for information. It may be updated as necessary as the project progresses.)*



*Schema of interdependencies of the partner groups*

ITEMS	RESPONSIBLE	Phone	
Information from M&E on work and data standard for the project	Dr. A.M. Taiwo		
Equipment and Facility supply	Mr A.S. Fadeyi		
Brief on required for work group 2	Mr D. Oluyege/E. Babajide		
Brief on field data required for work group 4	Prof O. Folorunso		
Brief on field data required for work group 5	Dr G.A. Ajiboye		
Brief on field data required for work group 6	Prof. O.I. Orimogunje		

WORK GROUPS DEPENDING ON THIS WORK GROUP	RESPONSIBLE	DUE DATE
Work group 7: Project Management	Dr J.A. Oyedepo	
Work group 2: Climate data generation and dissemination	Mr D. Oluyege/E. Babajide	
Work group 4: ICT (Agro-weather tools)	Prof O. Folorunso	
Work group 5: Climate-Smart Farming Education	Dr G.A. Ajiboye	
Work group 6: Climate Research for Dev't & Policy Advocacy	Prof. O.I. Orimogunje	

### SUMMARY OF MILESTONES

(Leaders should kindly complete the date and cost expended to reach each milestones)

REF	DESCRIPTION	DUE DATE	MILESTONE COST
M4.1	Functional Geo-portal		
M4.2	Automation of Geo-Net cast receiving station		
M4.3	Amalgamation of NIMET forecast with Geo-net cast (EWS) station		
M4.4	Progress report		
M4.5	Report of project Evaluation		
M4.6	Final project report for WG1		
M4.7	Publication of article(s) in high impact factor journal		

### GROUP TIME LINE AND ACTIVITY PLAN

Leader should meet with group members to prepare the approach they will use in achieving the objectives of this group including timeline of activities. This would be submitted as separate document to project management before funds would be released.

### FINANCIAL REPORT

At the end of the project the group leader will prepare a financial profile which would also be submitted as a separate document to the project management group. This is crucial to the release of the final tranche.

(All advances must be retired with authentic receipts)

### WORKGROUP 5

<b>WORK GROUP:</b>	Five
<b>SUMMARY OF ACTIVITY:</b>	Climate-Smart Farming Education
<b>DATE:</b>	July 2020
<b>REFERENCE:</b>	NRF/103197_WG05/CSFE.2
<b>GROUP RESPONSIBILITY:</b>	Dr G.A. Ajiboye;
<b>Surrogate Leadership:</b>	Dr F.A. Adewole; Dr O.Y. Ayo-Ajasa

### BACKGROUND

The essence of work group 5 is to meet the training needs of the farmers who are target beneficiaries of the project. The farmers are assumed to be new to climate information service, particularly in its application for decision making. They must be taught on how and where to access the information and how to apply it. They also need to be taught on best climate-smart practices. The group will conduct mother trials and demonstrate the outcome to the farmers through On-Farm Adaptive Trials (OFAT). The key element of the work group is therefore is to develop a manual for the accessories of the CIS/EWS. They will demonstrate best agricultural practices such as precision farming, mixed farming system, supplemental irrigation, fertigation etc.

## WORK PACKAGE OBJECTIVES:

This work package will focus on the following key objectives:

1. Develop a local content training programme for farmers (contact and distance learning)
2. Establish demonstration plots in six locations
3. Conduct mother trials where required and demonstrate the outcome to the farmers
4. Train the farmers on the use of local

## DESCRIPTION OF WORK AND WORK ELEMENT OUTPUTS

### 1. INPUT (*Inputs from other groups and research elements that will aid the success of this Work Group*)

- Information from the Principal investigator and the M&E for design of survey instruments
- Briefing from work group 1 on the training assessment conducted
- Briefing from work group 2 on the type of contents for internet radio, geo-portal and other dissemination means.
- Briefing from work group 3 on the interpretation of s2s climate prediction
- Briefing from work group 4 on the functionality of the Agro-weather tools developed
- Information from work group 6 on the kind of assessment to be conducted for use as part of policy briefs

### 2. OUTPUT (*Resulting outputs to be achieved in this Work Group*)

- Training manual
- Demonstration plots and OFAT
- Report on farmers' training on the use of CIS

## KEY WORK ELEMENTS (*Breakdown of tasks*)

*Leader of the group should write out the groups' work plan. S/he may also delegate tasks to group members*

1. Review of the work of WG 1, WG 2 and 3
2. Mother trials
3. Development of training contents
4. Writing of a training manual
5. Establishment of demonstration plots for OFAT
6. Demonstrate best c-smart agricultural practices (irrigation, early maturing crops, soil management (soil reclamation, erosion control, contour bonding), precision farming, mixed farming, water harvesting etc.
7. Periodic project evaluation
8. Conclusion of Report writing
9. Periodic presentation progress report and Final project report

## EQUIPMENT AND FACILITY REQUIREMENTS

1. Laptops computers (1 unit)
2. Camcorder (1 unit)
3. GPS enabled Android Tablets (10 units)
4. Smart phones for each community (72 units)
5. Hand held GPS devices (1 units)
6. GPS-enabled Android Tablets
7. Stationeries and printing facilities
8. Hilux pick-up vehicle
9. Sundry project pack with a hand bag
10. Personal Protective Equipment (ventilators and hand sanitizers etc.)

*Leaders should list out and make a request for items not listed. Direct your request to the PI through the M&E*

## SUMMARY OF KEY DELIVERABLES: *Breakdown WG deliverable elements with due dates.*

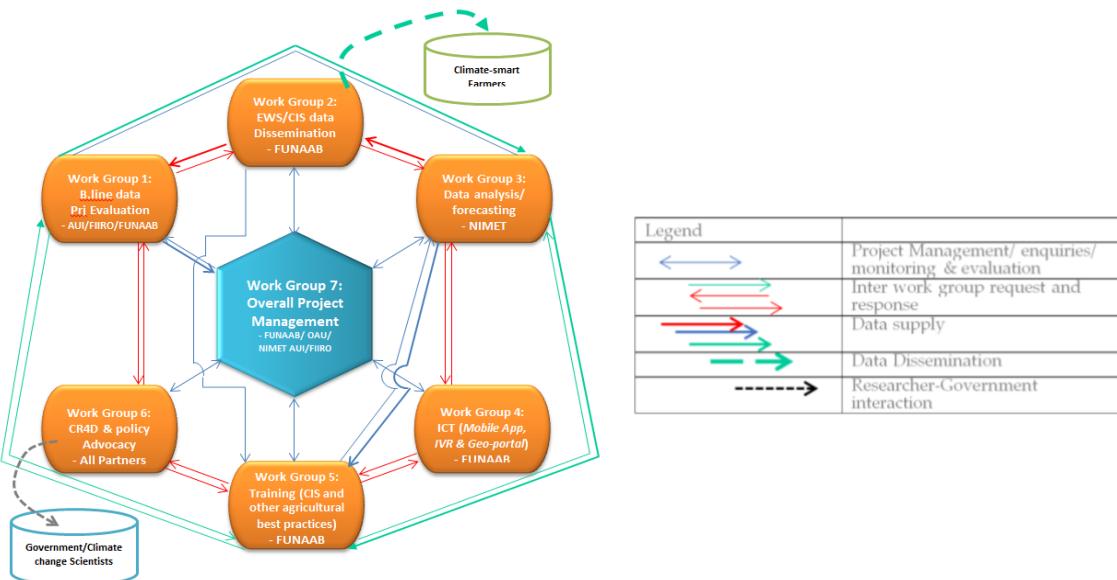
*(Group leaders could allocate responsibilities to members of the work group)*

REF	DESCRIPTION	RESPONSIBLE	DUE DATE
D5.1	Manual (C-Smart & Best practices; PF, irrigation, mix/ repeated crop cycle)		
D5.2	Result of mother trials (if any) on c-smart farming		
D5.3	Field report on farmers response to training and demonstration		
D5.4	Report/updates on Periodic evaluation		
D5.5	Submission of manuscript of academic article(s) for publication		

D5.6	Final report writing		
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## DEPENDENCIES

(This diagram shows you the work group that rely on information from your work group and those that you rely on for information. It may be updated as necessary as the project progresses.)



Schema of interdependencies of the partner groups

## ITEMS THAT MUST BE AVAILABLE FOR THIS WORK GROUP

This represents support your group require from other groups; the information will guide your group's actions

ITEMS FROM OTHER GROUPS	RESPONSIBLE	Phone
M&E briefings on work and data standard	Dr. A.M. Taiwo	0803-489-8675
Equipment and Facility supply	Mr A.S. Fadeyi	0803-418-5240
Brief on field data required for work group 1	Dr E.O. Oyedepo	08038648941
Brief on field data required for work group 2	Mr D. Oluyege/E. Babajide	08132568095 / 08096434106
Brief on field data required for work group 3	Dr K.A. lawal	0708-780-3764
Brief on field data required for work group 4	Prof. O. Folorunso	0803-564-0707

## WORK GROUPS DEPENDING ON THIS WORK GROUP

Kindly note that other groups depend on the outcome of your activities to make progress in their respective group works

WORK GROUPS DEPENDING ON THIS WORK GROUP	RESPONSIBLE	DU DATE
Work group 1: Baseline survey	Dr E.O. Oyedepo	
Work group 2: Climate data generation and dissemination	Mr D. Oluyege/E. Babajide	
Work group 6: Data analysis, Modelling and Forecast	Dr K.A. lawal	
Work group 7: Project Management	Dr J.A. Oyedepo	

## SUMMARY OF MILESTONES

(Leaders should kindly complete the date and cost expended to reach each milestones)

REF	DESCRIPTION	DU DATE	MILESTONE COST
	Completion of mother trials and perfection of group action plan		
	Successful development of training manuals		
	Completion of demonstration plots and farmers training		
	Delivery of Progress report		
	Report of project Evaluation		
	Publication of article(s) in high impact factor journal		
	Final project report for WG5		

## GROUP TIME LINE AND ACTIVITY PLAN

*Leader should meet with group members to prepare the approach they will use in achieving the objectives of this group including timeline of activities. This would be submitted as separate document to project management before funds would be released.*

## FINANCIAL REPORT

At the end of the project the group leader will prepare a financial profile which would also be submitted as a separate document to the project management group. This is crucial to the release of the final tranche. (*All advances must be retired with authentic receipts*)

## WORKGROUP 6

**WORK GROUP:** Six

**SUMMARY OF ACTIVITY:** Climate Research for Development and Policy Advocacy

**DATE:** July 2020

**REFERENCE:** NRF/103197\_WG06/CR4DPA.6

**GROUP RESPONSIBILITY:** Professor O. Orimogunje

**Membership:** Work Grp Leaders, members & climate research scientists in SW Nigeria

**CIRCULATION:** All project work groups & Project monitoring officer

## BACKGROUND

Climate-smart agriculture and climate information service to specific users are crucial to Africa's development agenda and response to climate change. With the two effectively paired, the region can attain economic gains and social development. Meanwhile, there are indications of knowledge gaps awaiting outcomes of scientific research. For instance, what are the real drivers of climate change? Are climate services in Africa effective or not? If otherwise, why and what is responsible for the failures? What are the climate information needs of specific users? Are there enough climate information? Can we set up Early Warning System at local levels? How best can CIS is incorporated into CSA to meet the key Sustainable Development Goals (SDGs) directly addressed by agriculture? These and more awaits answers.

In this project, they key task of the work group 6 is to seek answers to questions that will fill the missing link between sustainable developments challenges of Africa and CIS in CSA as a means to the end. The team of experts in this work group needs to explore the opportunities presented by this project to provide answers to the **central research question in relation to climate change and climate services namely**: What are the real drivers of climate change in Africa? What areas of climate change research receiving less attention from scientists should be strengthened? What are the reasons why climate research proposals from Africa are not attracting funds and what can be done to improve the scenario? What lessons can be learnt in this project from the farmers' response to interventions on climate information service? What policy recommendations can be made from this project? Particularly, how can this project be sustainable? What is the best method of integrating CIS with CSA to make climate service delivery more efficient in many parts of Africa; for maximum adoption, increased resilience and greater productivity in agriculture?

## WORK GROUP'S AIM & OBJECTIVES:

### *Aim*

The project aim is to explore the opportunities in this project with regards to developing an effective climate service system by integrating climate information system with climate-smart practice to address the problems of agricultural development in Africa

### *Objective*

The main objective is to uncover the underlying factors associated with failure of previous interventions Demonstrate that CIS with CSA can be a more sustainable solution to enhancing farmers' resilience to climate change and capacity to progress out of poverty.

## DESCRIPTION OF WORK AND WORK ELEMENT OUTPUTS

### 1.INPUT (*inputs from other groups and research elements that will aid the success of this Work Group*)

- Information from the Principal investigator and the M&E
- Briefing from work group 1 and 5 on the information in respect of policy briefs
- Briefing from work group 2-4 on functionality of CIS in relation to CR4D establishment

## **2. OUTPUT** (*Resulting outputs to be achieved in this Work Group*)

- Policy briefs
- CR4D platform
- Proposal for further funding
- Further exploratory outcomes
- Report and updates of periodic project Evaluation
- Final project report

## **KEY WORK ELEMENTS** (*Breakdown of tasks*)

- Review of activities of all work groups 1-5
- Distil out cogent findings and materials useful for policy briefs
- Prepare policy briefs from the project
- Identify the climate research gaps that needs to be filled with regards to national/African development
- Establish the platform of interaction for researchers interested in climate change research
- Organise national sensitization workshop
- Chart further project impact pathways
- Advocate and lobby for policy formulation to guarantee sustainability of Climate-smart and climate information practices in Africa
- Conclusion of Report writing
- Periodic presentation progress report and Final project report

## **EQUIPMENT AND FACILITY REQUIREMENTS**

1. Laptops computers (1 unit)
2. Progress reports from the first 5 groups
3. Stationeries and printing facilities
4. Hilux pick-up vehicle (when required)
5. Sundry project pack with a hand bag
6. Personal Protective Equipment (ventilators and hand sanitizers etc.)

*Leaders should list out and make a request for items not listed. Direct your request to the PI through the M&E*

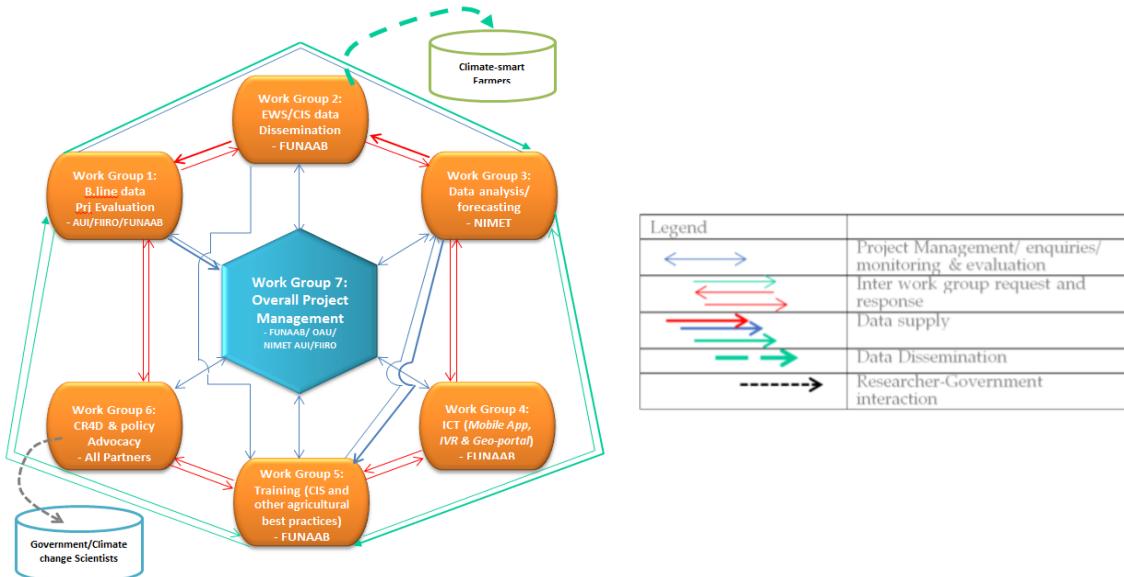
## **SUMMARY OF KEY DELIVERABLES:** *Breakdown WG deliverable elements with due dates.*

*(Group leaders could allocate responsibilities to members of the work group)*

REF	DESCRIPTION	RESPONSIBLE	DUE DATE
D6.1	Inferences from WG 1-5		
D6.2	Policy brief		
D6.3	Brief on CR4D constitution , meeting dates and operational ethics		
D6.4	Climate Research gaps identified		
D6.5	Report on solutions to Identified gaps		
D6.6	Manuscript of academic article(s) for publication (if any)		
D6.7	Final report writing		

## DEPENDENCIES

(This diagram shows you the work group that rely on information from your work group and those that you rely on for information. It may be updated as necessary as the project progresses.)



Schema of interdependencies of the partner groups

## ITEMS THAT MUST BE AVAILABLE FOR THIS WORK GROUP

This represents support your group require from other groups; the information will guide your group's actions

ITEMS FROM OTHER GROUPS	RESPONSIBLE	Phone
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Brief on field data required for work group 1	Dr E.O. Oyedepo	08038648941
Brief on field data required for work group 2	Mr D. Oluyege/E. Babajide	08132568095 / 08096434106
Brief on field data required for work group 3	Dr K.A. lawal	0708-780-3764
Brief on field data required for work group 4	Prof. O. Folorunso	0803-564-0707
Brief on field data required for work group 5	Dr G.A. Ajiboye	0813-723-0306

## WORK GROUPS DEPENDING ON THIS WORK GROUP

Kindly note that other groups depend on the outcome of your activities to make progress in their respective group works

WORK GROUPS DEPENDING ON THIS WORK GROUP	RESPONSIBLE	DU DATE
Work group 1: Baseline survey	Dr E.O. Oyedepo	
Work group 2: Climate data generation and dissemination	Mr D. Oluyege/E. Babajide	
Work group 6: Data analysis, Modelling and Forecast	Dr K.A. lawal	
Work group 7: Project Management	Dr J.A. Oyedepo	

## SUMMARY OF MILESTONES

(Leaders should kindly complete the date and cost expended to reach each milestones)

REF	DESCRIPTION	DU DATE	MILESTONE COST
	Policy formulation		
	Establishment of CR4D		
	Sensitisation workshop		
	Delivery of Progress report		
	Report of project Evaluation		
	Publication of article(s) in high impact factor journal (if any)		
	Final project report for WG6		

## GROUP TIME LINE AND ACTIVITY PLAN

*Leader should meet with group members to prepare the approach they will use in achieving the objectives of this group including timeline of activities. This would be submitted as separate document to project management before funds would be released.*

## FINANCIAL REPORT

At the end of the project the group leader will prepare a financial profile which would also be submitted as a separate document to the project management group. This is crucial to the release of the final tranche. (*All advances must be retired with authentic receipts*)

## BACKGROUND

The project has four components namely; 1) climate needs assessment of the beneficiaries, 2) quality climate data generation, 3) Climate information dissemination and 4) Exploitation of the project opportunities. The project would therefore be executed by Six work groups; making the project intricate. The need for a separate work group for management is inevitable. The work group 7 will coordinate work and liaise between all Project groups and report to Directorate of Research, Innovation and Partnership in FUNAAB and TETFUND throughout the duration of the project. The project management will follow the principles of Prince2 management process.

## WORK PACKAGE OBJECTIVES:

This work package will focus on the following key objectives:

- Efficient project management schedule with realistic slack between project modules allowing for possible extensions.
- Plan and monitor the project
- Direct and motivate the project team
- Prepare project stage plans in conjunction with team members
- Report to and liaise with Innovate UK (IUK)
- Monitor Work Packages' progress and schedule regular updates from Project Team Leaders
- Maintain a risk register
- Establish use of web-based project and team management tools with access and protocols for all Project Team Members
- Monitor and review business case for the Project
- Ensure project objectives and milestones are met

### 1. INPUT (*inputs from other team members and research elements that will enable this WG to be achieved*)

- All WGs detailing milestones and projected timeframes for elements
- Team members to provide status reports on a bi-monthly basis from the commencement date.
- All Group leaders to attend project team meetings either in person or via zoom/ video link.
- All team leaders to ensure documentation and requested project information is uploaded into team management system
- All team members to regularly update and identify risks

### 2. OUTPUT (*Resulting outputs to be achieved in this WP*)

- Successful completion of milestones
- Bringing project to completion on schedule
- Managing a change strategy in concert with project partners
- Mitigating any potential conflict between project teams

## KEY WORK ELEMENTS (*breakdown of tasks*)

- 7.1. Create project plan
- 7.1.1. Stage plan breakdown
- 7.1.2. Define frequency and format of reporting for all WGs and teams
- 7.1.3. Define handover milestones between Work Packages
- 7.2. Schedule Project team meetings
- 7.2.1. Project initiation. Re-confirm project scope and WG tasks
- 7.3. Establish web-based project management system
- 7.3.1. Subscription and set-up of Microsoft 365 management suite
- 7.3.2. Allocate folders and access to individual team members
- 7.3.3. Enable assessment of progress against project plan
- 7.4. Liaise with and report to DRIP/TETEFUND

- 7.4.1. Meeting schedule with DRIP/TETFUND monitoring officer
- 7.4.2. Assimilate advice and project lessons from DRIP/TETFUND
- 7.5. Monitor WG progress across the Project.
  - 7.5.1. Review WGs with team leaders, agree details and deliverables.
  - 7.5.2. Define WG target dates, quality expectations, delivery and reporting dates.
  - 7.5.3. Confirm and approve handover of WG deliverables to dependent WGs
  - 7.5.4. Prepare communication management strategy
    - 7.5.4.1. Procedures
    - 7.5.4.2. Roles & responsibilities
    - 7.5.4.3. Issue register
    - 7.5.4.4. Corrective action planning
  - 7.6. Monitor & review business case for the project
    - 7.6.1. Create exploitation plan & share with project partners & IUK
    - 7.6.2. Costs & timescale for project
    - 7.6.3. Expected benefits
    - 7.6.4. Set tolerance margins for each benefit specified in project planning
  - 7.7. Establish log of lesson and risks updates from all project partners
    - 7.7.1. Risks log implementation and risk analysis strategy
    - 7.7.2. Lessons Log implementation
  - 7.8. Implement protocols for Project meeting preparations and follow-up.

#### **EQUIPMENT AND FACILITIES**

(*all equipment, software and hardware needed for completion of this WP any subcontractors specified in WP budget*)

- Administrative assistant (55% of budgeted amount)
- Subscription to Microsoft 365
- Laptops computers
- Stationeries and printing facilities
- Office cabinet and files
- Toyota corolla monitoring vehicle
- Zoom meeting/Google meet platform
- Email address for the project
- Project WhatsApp
- Bulk SMS for the group
- Project office (FUNAAB)
- Project bank account
- Personal Protective Equipment (ventilators and hand sanitizers etc.)
- Internet facility
- Data subscription and

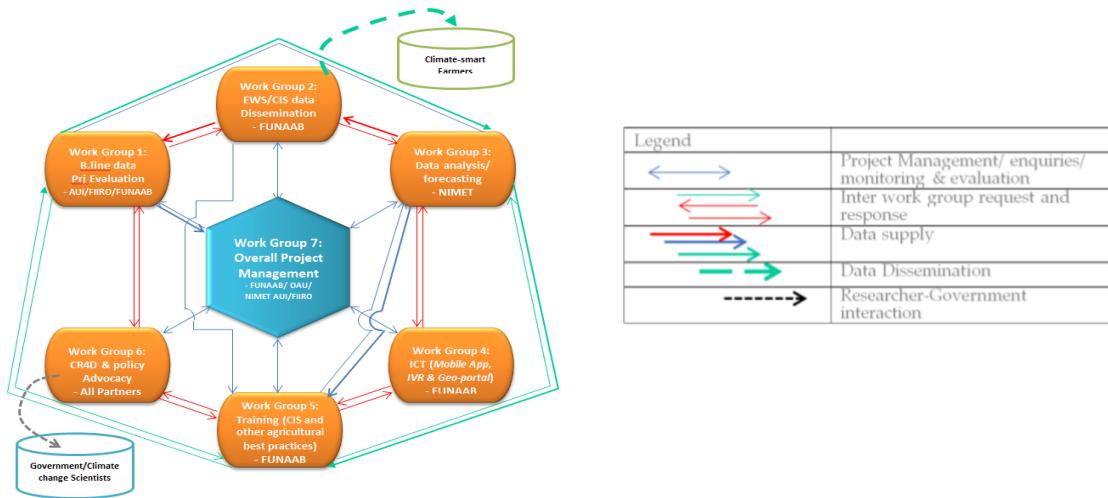
#### **SUMMARY OF KEY DELIVERABLES:** *Breakdown WG deliverable elements with due dates.*

(*Group leaders could allocate responsibilities to members of the work group*)

REF	DESCRIPTION	RESPONSIBLE	DUE DATE
D7.1	Create overall project plan		
D7.2	Schedule team meetings		
D7.3	Establish web-based project management system		
D7.4	Assign duties to members and design project implementation strategies		
D7.5	Supply needs of work groups & ensure welfare of all project members		
D7.6	Monitor Work Group Progress across the project		
D7.7	Implement protocols for Project meeting preparations and follow-up		
D7.8	Establish log of lessons and risk updates		
D7.9	Liaise with and report to DRIP and TETFUND		
D7.10	Collate group reports, submit and defend final reports		
D7.11	Prepare, submit financial report, retire project fund to DRIP/ TETFUND		
D7.12	Organise all workshops and project exploration and impact channels		

## DEPENDENCIES

(This diagram shows you the work group that rely on information from your work group and those that you rely on for information. It may be updated as necessary as the project progresses.)



Schema of interdependencies of the partner groups

## ITEMS THAT MUST BE AVAILABLE FOR THIS WORK GROUP

This represents support your group require from other groups; the information will guide your group's actions

ITEMS FROM OTHER GROUPS	RESPONSIBLE	Phone
Brief on field data required for work group 1	Dr E.O. Oyedepo	08038648941
Brief on field data required for work group 2	Mr D. Oluyege/E. Babajide	08132568095 / 08096434106
Brief on field data required for work group 3	Dr K.A. lawal	0708-780-3764
Brief on field data required for work group 4	Prof. O. Folorunso	0803-564-0707
Brief on field data required for work group 5	Dr G.A. Ajiboye	0813-723-0306
Brief on field data required for work group 6	Prof O.I. Orimogunje	0803-585-5946

## WORK GROUPS DEPENDING ON THIS WORK GROUP

Kindly note that other groups depend on the outcome of your activities to make progress in their respective group works

WORK GROUP	RESPONSIBLE	DU DATE
Work group 1	Dr E.O. Oyedepo	
Work group 2	Mr D. Oluyege/E. Babajide	
Work group 3	Dr K.A. lawal	
Work group 4	Prof. O. Folorunso	
Work group 5	Dr G.A. Ajiboye	
Work group 6	Prof O.I. Orimogunje	

## SUMMARY OF MILESTONES

(Leaders should kindly complete the date and cost expended to reach each milestones)

REF	DESCRIPTION	DU DATE	MILESTONE COST
	Project initiation and management systems as implemented		
	WG1 baseline survey & project evaluation		
	WG2 Established EWS/CIS for data generation & dissemination		
	WG3 Data acquisition, analysis and S2S forecast		
	WG4 Agro-weather Tools and other CIS dissemination routes		
	WG5 Completion of tasks on C-smart farmers training		
	WG6 Established CR4D, Policy developed and lobbying starts		
	Compiled report of project submitted		

## GROUP TIME LINE AND ACTIVITY PLAN

*Leader should meet with group members to prepare the approach they will use in achieving the objectives of this group including timeline of activities. This would be submitted as separate document to project management before funds would be released.*

## FINANCIAL REPORT

At the end of the project the group leader will prepare a financial profile which would also be submitted as a separate document to the project management group. This is crucial to the release of the final tranche. (*All advances must be retired with authentic receipts*)

## Project Risk register and mitigations

## EXPECTED RESULTS:

Establishments of Climate information service Early warning systems, climate-smart villages and effective dissemination of climate information will produce positive impacts on the attitude, behaviour and productivity of target audience. About 1,600 farmers disaggregated into 960 male and 640 female farmers are expected to be reached. Their productivity and means of livelihood to be raised by 70%.

The following outputs are expected

- Development of Effective Early warning System (EWS) for Agriculture for 6 states
- Establishment of 6 climate-smart villages
- Establishment of Climate Research for Development group
- Release of Policy briefs for CIS/C-smart practices
- Training of at least 1440 people (580 women and 860 men) on best practices of the use of climate information to improve livelihood.
- Effective tackling of challenges of food security
- Improved resilience and livelihood amongst local farmers
- Improved production capacity through profitable agricultural practices
- Reduction in agricultural losses arising from climate-induced disasters
- Adoption of climate-smart innovations by farmers
- Better livelihood for women folk
- Reduced poverty
- Achievement of the sustainable development goals 1, 2 and 3
- Youth and women empowerment through access to agriculture financing
- Effective dissemination of CIS

## INNOVATION:

In the present proposal, the proponents rely on the experience from a recently concluded project on Development of Early Warning System for Management of Agricultural Disasters in South Western Nigeria. The unique selling point of the present proposal is the integration of Climate information service with a near real-time warning system built on a ground receiving station hooked on to GEONETCast (a low global environmental delivery system that transmits satellite in-situ data, products and services from GEOSS to users through communication satellites, using a multi-cast access-controlled broadband capability).

## APPENDICES

### APPROVED TIMELINE

S/N	Description Of Activity	Duration	Year	Quarter			
				1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>
1	Inception meeting at FUNAAB		2020				
2	Travel for consultations with stakeholders in the six States (back and forth)		2020				
3	Baseline survey and climate needs assessment of 1000 farmers Qualitative /Quantitative data/Environmental data Using FGD, KII		2020				
4	Data analysis Report of baseline survey		2020				
5	First review meeting and progress report		2020				
6	Establishment of EWS & commencement of Climate Information dissemination/demonstration of its use		2020-2021				
7	Archival/secondary data collection /Satellite data		2020				
8	Establishment of C-Smart villages /Introduction of C-Smart practices, Demonstration on farm in six states		2020				
9	second review meeting / Mid-term project report, meeting, workshop (discuss milestones, success stories and actualization of						
10	Assessment of the influence of the project on poverty reduction developmental challenges, sustainable development goals						
11	Establishment of Climate Research For Development CR4D						
12	Increment of direct beneficiary from 1,000 to 5,000 (train the trainer approach)		2021				
13	Presentation of paper on findings in international fora (conferences or summit)		2021				
14	Constitution of advisory service and advocacy groups		2021				
15	Development of policy briefs, course synopsis, monographs etc		2021				
16	Draft Report write-up		2021				
17	Stakeholder's workshop		2021				
18	Correction of reports/ presentation of reports		2021				
19	Project closure meeting in FUNAAB		2021				
20	Submission of final report to Teffund						

SN	Activities	Months															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Inception meeting at FUNAAB																
2	Travel for consultations with stakeholders in the six States (back and forth)																
3	Baseline survey and climate needs assessment of 1440 farmers Qualitative /Quantitative data/Environmental data Using FGD, KII and structured interviews																
4	Data analysis Report of baseline survey																
5	First review meeting and progress report																
6	Establishment of EWS & commencement of Climate Information dissemination/demonstration of its use																
7	Archival/secondary data collection /Satellite data																
8	Establishment of C-Smart villages /Introduction of C-Smart practices, Demonstration on farm in six states																
9	second review meeting / Mid-term project report, meeting, workshop (discuss milestones, success stories and actualization of impact goals & impact pathways																
10	Assessment of the influence of the project on poverty reduction developmental challenges, sustainable development goals																
11	Establishment of Climate Research For Development CR4D																
12	Increment of direct beneficiary from 1,440 to 5,760 (train the trainer approach)																
13	Presentation of paper on findings in international fora (conferences or summit)																
14	Constitution of advisory service and advocacy groups																
15	Development of policy briefs, course synopsis, monographs etc																
16	Draft Report write-up																
17	Stakeholder's workshop																
18	Correction of reports/ presentation of reports																
19	Project closure meeting in FUNAAB																
20	Submission of final report to Tefund																

## RELEVANCE OF THE PROJECT

The project is expected to assist in overcoming climate related agricultural constraints through dissemination information useful in the design of a climate-smart national agricultural system and near real-time warning against agricultural disasters from extreme weather conditions. The project is in line AU Agenda 2063, Global Framework for Climate Services (GFCS) to guide the development and application of science-based climate information and services. The project is consonance with the World Climate Research Programme (WCRP) 10 years strategic plan and consistent with IPCC 6th assessment report.

- Climate-smart villages and effective dissemination of climate information will produce positive impacts on the productivity of target audience.

- Data gathered from preliminary survey will assist in designing programmes aimed at improvement of people's productivity and potentials of actualising the SDGs 1, 2, 3, and 13.
- It will contribute to Poverty Reduction Strategic of included countries.
- The first, second and third CR4D priorities for research will be addressed as well as climate research gaps iv, iii and vi

### **PROJECT IMPACT GOALS**

The project has impact goals for the academia, policy-makers, rural Africans and civil society organizations.

For rural Africans there will be:

1. Increased resilience to climate change and improved livelihood
2. Reduction in agricultural losses arising from climate-induced disasters
3. Zero hunger amongst farmers
4. Better livelihood and reduced for rural folks (women folk, and the vulnerable group),
5. Improved climate service infrastructures in remote communities

The academia will have:

1. Paradigm shift in understanding of the science, politics and economies of climate change and climate services.
2. Access to research outcomes information will improve knowledge on the drivers of climate change in Africa.
3. More data available and newer insights to future climate research

For policy-makers:

1. The project result will reveal existing local and regional policies for climate change mitigation with emphasis on the gaps to address
2. The project outcome will assist policy makers take more practical actions for example on provision of better climate services
3. The project will provide scientific evidence for policy decision in ameliorating socio-political and economic problems.

For the Civil society organisation the research outcome will indicate type interventions and climate services are required as well as where to effectively deploy such actions.

### **PATHWAYS TO IMPACT**

**The rural folks**

- The establishment of Climate-smart villages will serve as resource centres for farmers and rural folks organised into climate-smart groups for training, practical demonstrations, advisory services and other interventions. Training on integrated farming approach and market strategies will be done to help farmers increase crops' yield, profits, and also improve the quality of their farmland. Through mobile phones, farmers will have access to CIS, send questions to C-Smart villages and get response

Academia

- The project will set up academic advisory board and grant unhindered access to climate data and research outcomes. Short communications, research monographs and papers presentation in seminars, workshops and journal articles would be a good avenue to reach the academia.
- Policy-makers
- Policy briefs will be made available through constituted policy advisory board/policy advocacy group

Civil society Organisations (CSOs)

- The CSOs will be involved in the project and the outcome will be communicated to them through Stakeholders' workshop.

### **CONTEXT AND BACKGROUND KNOWLEDGE:**

The project will demonstrate practical climate adaptation strategies while addressing burning issues in African Climate Research Agenda for Climate Services and Development. It attempts to fill knowledge gap previous climate service through:

- Improved understanding of the drivers and dynamics of climate change in parts of Africa,
- Improved knowledge on the climate information needs in African agriculture, water and disaster prediction,
- Improved knowledge on means of effective communication of climate information in near real-time for decision support at very local levels.

- Improved knowledge on the contribution of climate information service in climate-smart practices for enhanced resilience and other adaptation strategies.

### **MAJOR DEBATES OF SOME SPECIFIC WORK CLOSELY LINKED TO THE TOPIC.**

Outcomes of climate change adaptation studies and search for sustainable solution to challenges confronting small holder agriculture in Africa [1] abounds. While many argue that climate smart agriculture (CSA) is probably one of the most viable and sustainable options [2-6] among several measures [7] suggested reducing vulnerability of smallholder farmers to the impact of climate change. Other authors however, express reservations on its effectiveness advocating for alternative 'climate-wise' framework [8]. Perhaps the adoption of CSA lacks striking results, or its conceptual underpinnings are unclear. The methodologies of presenting CSA to farmers could also be faulty. ActionAid [9], believe CSA would not save the planet, because it neither addresses the root causes of the problem, nor strengthen the sustainability and resilience of farmers, rather Agro-ecology does.

The World Bank's presentation of CSA as holistic solution to climate change issues in Agriculture does not consider political issues surrounding food system structure, the power dynamics within current food systems, human rights, sustainability and equality. Political Economy Analysis of CSA is important for its effectiveness. CSA may require strengthening with other interventions as Climate Information Services (CIS).

Climate Information Service (CIS), as a matter of fact have pushed for its integration into development agendas [10] as means of achieving development goals [11], increasing resilience and increasing production [12]. Again there are underlying factors that may not allow CIS to function as a stand-alone solution. For instance, CIS requires reinforcement by people [13, 14, 15] especially, the Civil Society Organizations. Apart from this CIS requires infrastructures as Early Warning System with access to quality near real-time climate data. Lack of infrastructure for quality climate data, poor skills in scenario modeling, accurate prediction and effective communication of relevant information to farmers and users at a more specific scale will render CIS framework ineffective. Lack of climate information, national level planning and implementation are major constraints in adoption of CSA [16, 17].

The foregoing suggests that a combination of CIS and CSA is an urgent intervention for African agriculture. The advocates of this integration must however bear in mind that there is need for research into how this will work since there is a gap between where the Paris Agreement commitments will get us, and where science says we need to be [18].

#### *Contribution to existing literature,*

The present researches will contribute to knowledge at least four areas:

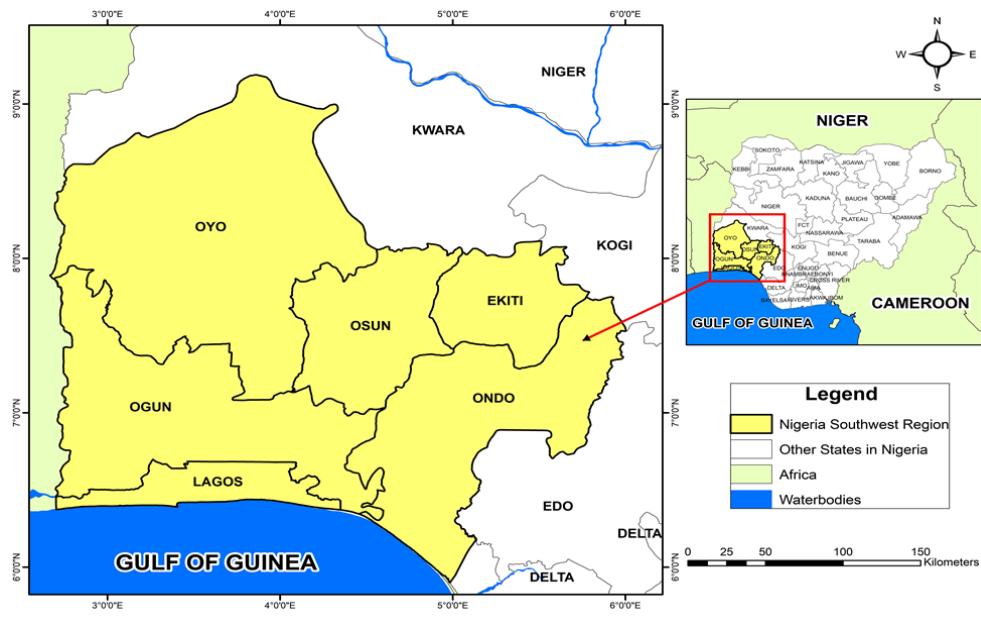
- Knowledge on the real drivers of climate change & emerging innovation for adaptation by rural folks
- Effect of integration of CIS with CSA on its adoption by farmers
- Effect of the integration on CSA in its expected service delivery in 3 areas
- Effect of the integration on actualization of SDGs 1,2,3, and 13

#### *Links between institution's research agenda and this topic*

Institute of Food Security, Environmental Resources and Agricultural Research the Federal university of Agriculture Abeokuta in the last six years the programme has been working on climate research specifically; development of Early Warning System for agricultural and Effective climate information services for food and agricultural security in selected African countries. Other climate research includes a study on vulnerability of Agro pastoralists to climate change and emerging innovations for adaptation. The present applicant played key roles in all these researches, this proposal is leveraging on facilities and experience from these previous projects.

### **DESCRIPTION OF THE FIELD OF STUDY**

The study will be carried out in Southwest Nigeria, with a special focus on rural farming households. The south west one of the six geo-political zones in Nigeria is divided into six states administrative boundaries namely: Ekiti, Lagos, Ogun, Ondo, Osun and Oyo. The zone has a land size of 114.271 km<sup>2</sup> (approximately 12 percent of the country's land mass) and population of about 32.5 million (21 percent of the country's human population) (WPR, 2019). The area exhibits typical tropical climate of averagely high temperature and high relative humidity. The temperature is relatively high during the dry season with the mean around 33° C and low temperature is experienced during the rainy season with the mean around 24° C. The rainfall pattern is double peaked and distribution varies from about 1 000 mm to about 2 000 mm. There three main types of vegetation, namely, mangrove forest, tropical rainforest and guinea savannah. Agriculture is largely rural, extensive and rain-fed.



*Map showing SW States of Nigeria*

## DESCRIPTION OF THE GROUP OF ACTIVITIES IN THE PROJECT

The proposed project will be conducted under four main groups of activities as listed below:

1. Baseline survey
2. Construction of the Infrastructure for Early warning System
3. Effective dissemination of climate information for resilience to climate impacts
4. Data analysis
5. Execution of Sustainability Plans

Details of the methods for each group of activities is as described below:

## IMPLEMENTATION ARRANGEMENT AND CAPACITY

For the purpose of effective administration, the project will have three level of monitoring mechanisms namely:

1. Monitoring and Evaluation at Principal Investigator level
2. Monitoring at The Institutional level
3. Monitoring by the M&E team from TETFUND

### 1. Monitoring and Evaluation at Principal Investigator level:

The project head office will be domiciled in the Federal University of agriculture Abeokuta from where the PI shall direct the affairs of the research work. The PI shall move from state to state to perform oversight functions. He shall appoint on each state one co-investigator as the state level coordinator to be assisted by one of the research assistant.

The research collaborators will work with the PI to provide oversight of the at the state level while the PI serve as the overall project coordinator who will oversee the success of the project and shall be answerable to the donor and the monitoring and evaluation system of the donor.

The PI shall ensure that assigned tasks to co-investigators and their research assistants are carried out in accordance to the objectives of the research and the time specified for its accomplishment.

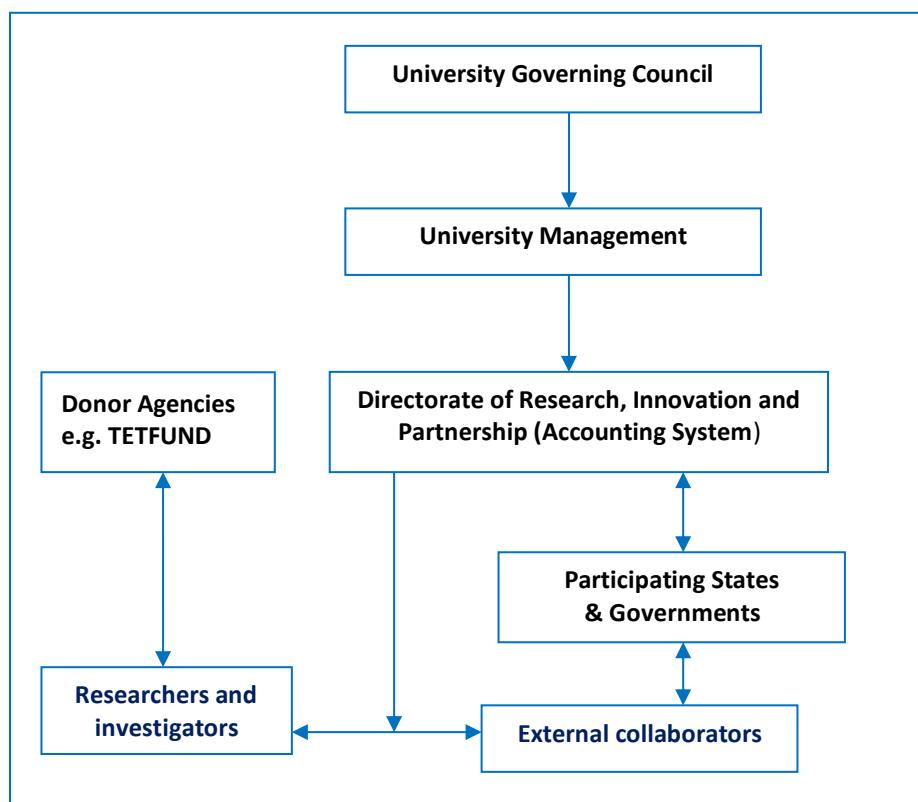
The PI shall call for Review meetings every quarter to assess progress reports and correct any noticed flaws. In the review meeting each investigator and research assistants will be made to present their progress report along with the objectives or mandates. The coordinator will then merge the presentations/submissions into one progress report.

The PI will also be saddled with the responsibility of liaising with relevant government agencies to ensure, not only the success of the project but its continuity and sustainability. They will coordinate or delegate responsibilities as deemed appropriate with respect to writing of quarterly reports, conduct of impact assessment, procurement of local items organisation of workshops, training of farmers functional climate-smart villages.

## **2. Monitoring at The Institutional (University) level:**

At the University level the project will also be monitored by the M&E team of the Directorate for Research, Innovation and Partnership which has the mandate for research management including Monitoring, Evaluation and Quality control and Assurance

The proposed organizational structure for project implementation and arrangements for dealing with external agencies is summarised by the schema below.



*Proposed organizational structure for project implementation and arrangements for dealing with external agencies*

## **3. Monitoring by the M&E team from TETFUND:**

The independent Monitoring team from TETFUND would be expected to visit the project for monitoring and evaluation as they chose. The project must be prepared to receive the TETFUND Monitoring and Evaluation team as often as they shall appoint

## **DIRECTORY OF PROJECT PARTNERS**

### **A. Principal Researcher:**

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**PROJECT MANAGEMENT**

- |                      |  |
|----------------------|--|
| 1. Dr J.A. Oyedepo   | Principal Investigator/ Leader Work Groups 2 & 7 |
| 2. Prof O. Folorunso | Co-investigator and Leader Work Group 4          |
| 3. Prof O.Orimogunje | Co-investigator and Leader Work Group 6          |
| 4. Dr G.A. Ajiboye   | Co-investigator and Leader Work Group 5          |
| 5. Dr K.A. Lawal     | Co-investigator and Leader Work Group 3          |
| 6. Dr E.O. Oyedepo   | Co-investigator/Leader Work Group 1/Fiscal       |
| 7. Dr A.M. Taiwo     | Co-investigator/ Monitoring & Evaluation desk    |
| 8. Dr F.A. Adewole   | Member Work Group 5 & secretarial                |
| 9. Mr Abraham Fadeyi | Logistics  |

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Signature of Principal Researcher:

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Signature of Chairman ICR:

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Signature of Head of Department:

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Signature of Head of Institution