SERVIR WEST AFRICA

ANNUAL WORK PLAN – FY 2017

DECEMBER 2016

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Cover Photo: Honorable Brigi Rafini, Prime Minister of Niger, Mr. Kassoum Denon, Coordinating Minister of CILSS, Major General Charles Bolden, NASA Administrator and Mr. Alex Deprez, USAID/WA Mission Director launch SERVIR West Africa. Credit: Sharon Kellmen-Yett, July 2016.

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ACRONYMS AND ABBREVIATIONS

ACMAD	African Center of Meteorological Application for Development
ADS	Automated Directives System
AfriGEOSS	African Global Earth Observation System of Systems
AGRHYMET	Agrometeorology, Hydrology, Meteorology Regional Center (of CILSS)
AST	Applied Science Team
CERSGIS	Center for Remote Sensing and Geographic Information Services
CIESIN	Center for International Earth Science Information Network (Columbia University)
CILSS	Permanent Interstate Committee for Drought Control in the Sahel
CLA	Collaborating, Learning, Adapting
COP	Chief of Party
CRM	Customer Relationship Management
CSE	*Centre de Suivi Ecologique*
DOC	Development Outreach Coordinator
ECOWAS	Economic Community of West African States
EO	Earth Observation
ePORT	Electronic Project Observation, Reporting, and Tracking
FEWSNET	Famine Early Warning Network
FY	Fiscal Year
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information Service
GIT	Geo-Information Technology
GLOBE	Global Learning in Observations to Benefit the Environment
GPM	Global Precipitation Measurement
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IR	Intermediate Result
IRI	International Research Institute for Climate and Society (Columbia University)
LOP	Life of Project
M&E	Monitoring and Evaluation

MEP	Monitoring and Evaluation Plan
MoU	Memorandum of Understanding
MSU	Management Support Unit (CILSS)
NDC	Nationally Determined Contributions
NSDI	National Spatial Data Infrastructure
NASA	National Aeronautics and Space Administration
NGO	Nongovernmental Organization
OGC	Open Geospatial Consortium
PCU	Program Coordination Unit
PI	Principal Investigator
PRG	Peer Reference Group
PSD	Peer Service Design
RCMRD	Regional Centre for Mapping Resources for Development
RECTAS	Regional Center for Training in Aerospace Surveys
SAGE	SERVIR Annual Global Exchange
SDT	Service Design Team
SCO	Science Coordination Office
SEDAC	Socioeconomic Data and Applications Center
SOW	Scope of Work
STTA	Short-Term Technical Assistance
TRMM	Tropical Rainfall Measuring Mission
USAID	United States Agency for International Development
UNCCD	United Nations Convention to Combat Desertification
WA	West Africa

1.0 INTRODUCTION

On March 21, 2016, USAID awarded Tetra Tech a five-year contract to support the Agrometeorology, Hydrology and Meteorology Regional Center (AGRHYMET) in the implementation of SERVIR West Africa. The goal of SERVIR West Africa (SERVIR WA) is to increase the ability of institutions across the region to apply geospatial technologies and analysis to improve the region's resilience to climate change impacts and ensure that land use management reduces greenhouse gas (GHG) emissions. The program supports the Permanent Interstate Committee for Drought Control in the Sahel (CILSS)/AGRHYMET's ability to increase the supply of geospatial information and knowledge products and services for resilient and low carbon development to member countries in food security and agriculture; water and water-related disasters; land cover and land use change and ecosystems; and weather and climate. To support this goal, SERVIR WA has the following program objectives:

1. Build the capacity of analysts and decision makers in government, civil society groups, and the media to integrate geospatial data, including climate data, and technologies into their analysis, operational systems, policy, planning, management, and communications.
2. Raise awareness of and increase access to geospatial data and information by improving management and access to existing and new data and information at national and regional levels.
3. Create user-tailored geospatial products and services (such as decision support tools, applications, models, dissemination, and training) to get information to the people who need it to address priority development issues, in collaboration with NASA and other international scientists.

To achieve these objectives, the program will carry out the following five tasks:

Task 1: Improve the institutional capacity of AGRHYMET and partners to provide regional services and plan for sustainability of SERVIR WA (Intermediate Result 1 or IR 1).

Task 2: Provide support to AGRHYMET and partners to improve the capacity of analysts and decision makers to use geospatial information, including climate information, through dedicated capacity-building and training programs (IR 2).

Task 3: Provide support to AGRHYMET and partners to improve awareness and access to geospatial data, products, and tools through appropriate platforms (IR 3).

Task 4: Provide support to AGRHYMET and partners to provide products and services to address decision makers' needs in agriculture, water, weather and disasters, land use, and sustainable management of coasts and forests (IR 4).

Task 5: Establish formal and informal exchanges with other SERVIR hubs.

This Work Plan for Fiscal Year 2017 (FY17) covers the period of performance from October 1, 2016 through September 30, 2017, and describes the major activities SERVIR WA will undertake to achieve the target results for FY17. The work plan is organized according to the intermediate results (IRs) in the SERVIR West Africa results framework. Linkages to performance indicators are shown followed by the activities to be carried out during the period. A mid-year progress report and annual report will detail program activities and results completed throughout the year.

The presentation of intermediate and sub-intermediate results includes:

- An overview of the standard and custom indicators and corresponding targets for the period; and
- A brief description of the anticipated activities during the period.

Annexes to the work plan include executive summary of the stakeholder consultations held in August (Annex A), a Year 1 activity schedule (Annex B), and deliverable tracker (Annex C).

2.0 PROGRAM OVERVIEW

The SERVIR WA regional hub is a consortium of national and regional organizations led by AGRHYMET. It includes the Center for Remote Sensing and Geographic Information Services (CERSGIS), *Centre de Suivi Ecologique* (CSE), Regional Center for Training in Aerospace Surveys (RECTAS), African Center of Meteorological Applications for Development (ACMAD), and International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) with support from the National Aeronautics and Space Administration (NASA) Applied Sciences Team (AST), and the SERVIR Support Team. The role of Tetra Tech is to support AGRHYMET and the consortium members through technical, financial, and administrative management of the program. Subcontractors Kanava and Columbia University's Center for International Earth Science Information Network/International Research Institute for Climate and Society (CIESIN/IRI) have unique technical capacity related to specific SERVIR WA activities. The technical capabilities of each organization will play an important role in the success and sustainability of the SERVIR WA hub. The hub hereafter represents AGRHYMET, CSE, CERSGIS, RECTAS, ACMAD, and ICRISAT.

SERVIR WA is designed to increase the ability of AGRHYMET, the technical arm of the CILSS, and other institutions in the region to apply geospatial technologies and analyses to improve the resilience of the region to the impacts of climate change, and ensure that land use management is both sustainable and reduces GHG emissions. The initial activities of SERVIR WA will focus on building the capacity of AGRHYMET and the aforementioned SERVIR WA institutions, which are based in Ghana, Burkina Faso, Senegal, Nigeria and Niger. It is expected that activities undertaken by SERVIR WA will address both Sahelian and coastal issues, and will engage countries across the region with varying levels of capacity. Over time, based on performance and additional funds from USAID or partners, activities are likely to expand to additional institutions in other countries across West Africa, in line with CILSS's mandate.

The program has four IRs, as illustrated in Figure 1, which have corresponding activities in Year 1 and over the life of project (LOP):

IR 1: Improve the institutional capacity of AGRHYMET and partners to provide regional services and plan for sustainability of SERVIR WA.

> Through IR 1, SERVIR WA will strengthen the institutional capacity of AGRHYMET and partners to improve administrative and financial operations, service provision, partnership, and sustainability, in order to insure that AGRHYMET will continue to provide leadership and coordination for the international response to the impacts of climate change in West Africa. Activities to achieve this result will focus on supporting the CILSS Management Support Unit (MSU) in carrying out process modeling and re-engineering of AGRHYMET's administrative and operational functions. The Program Coordination Unit (PCU) will concentrate on facilitating the hub members' institutional self-assessments of capacity, carrying out organizational capacity-building activities for hub members as identified, developing and monitoring the Hub Sustainability Plan, developing and implementing an effective communication and outreach strategy, making timely content contributions to the Hub website and SERVIR Global, and expanding on hub member partnership agreements between AGRHYMET and other hub member institutions.

IR 2: Provide support to AGRHYMET and partners to improve capacity of analysts and decision-makers to use geospatial information, including climate information, through dedicated capacity building and training programs.

Through IR 2, technical capacity building will be undertaken at multiple levels to support members of the consortium, end-users and potentially other intermediaries to use SERVIR West Africa's services in decision making. To achieve this, the SERVIR WA Program Coordination Unit (PCU) will establish a baseline of current knowledge and capabilities, develop training and address capacity needs in each of the four thematic areas, and provide technical assistance through support from CIESIN and SCO scientists.

IR 3: Provide support to AGRHYMET and partners to improve awareness and access to geospatial data, products, and tools through appropriate platforms.

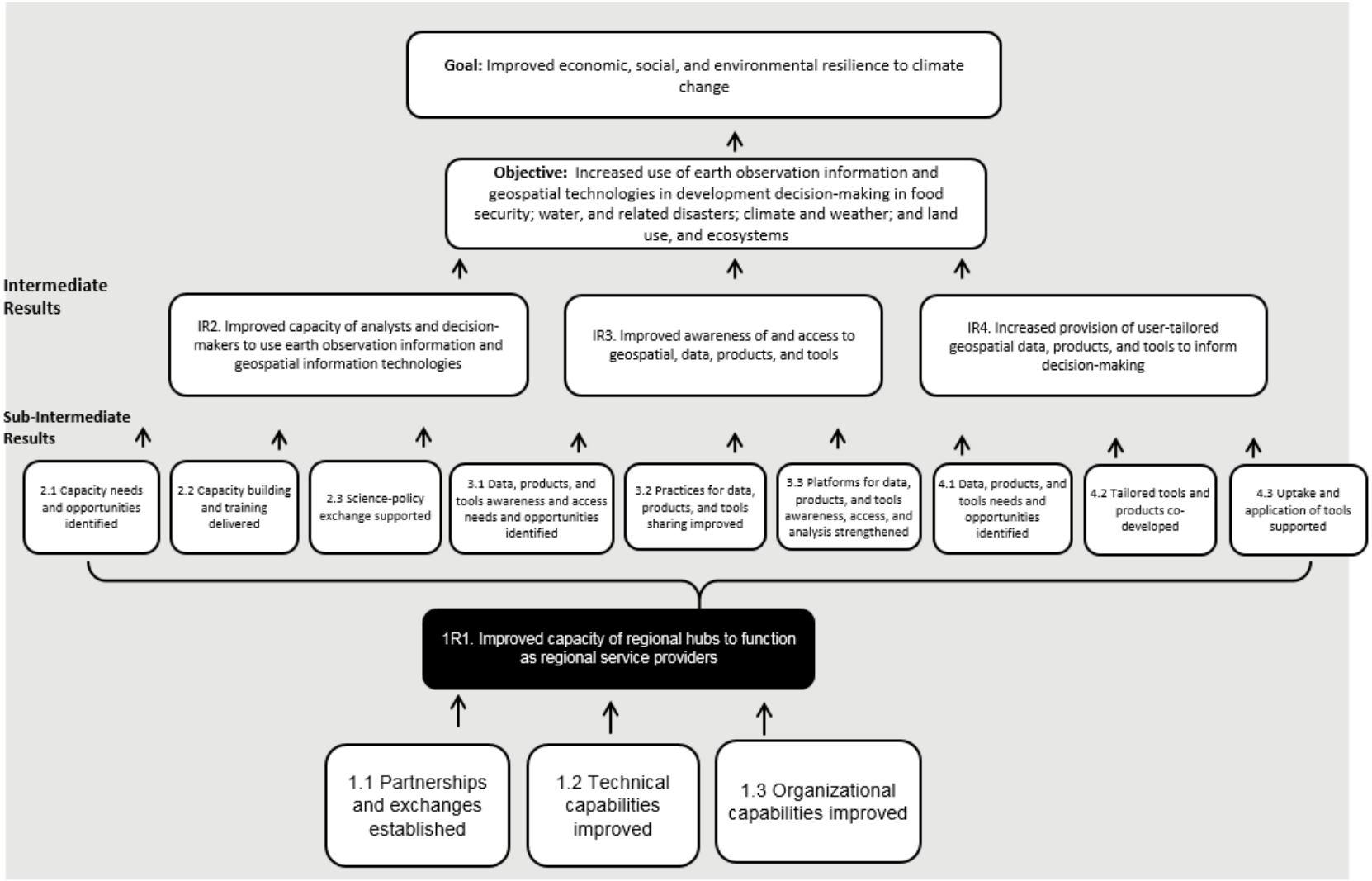
IR 3 activities will address the information needs of West African institutions through effective engagement with hub institutions on existing initiatives designed to improve access, management, and dissemination as well as to encourage and facilitate sharing of geospatial data and information. To achieve this, SERVIR WA will inventory existing geospatial datasets and tools, data standards, and data sharing platforms relevant to each thematic area; support the participatory development of an open repository of datasets to promote access and sharing of geospatial datasets and tools that can be sustained; establish an open data working group to promote open access and management of geospatial data and tools among the hub members; facilitate dialogue between data providers, capacity-building groups, and information users; and support development of analytical products on SERVIR WA services throughout the year.

IR 4: Provide support to AGRHYMET and partners to provide products and services to address decision makers' needs in food security and agriculture; water and water-related disasters; land cover and land use change and ecosystems; and weather and climate.

IR 4 activities will focus on assisting the hub members to co-develop user-tailored geospatial products and tools to inform decision-making. To achieve this, the PCU will map the decision-making landscape for each thematic service developed, implement the user-centered service planning approach to service development, support expanded service dissemination, and monitor usage.

The PCU will also seek out opportunities for SERVIR hub exchanges, regional exchange visits, and regular collaboration between hub staff and institutions to cross-fertilize and generate synergies among institutional efforts.

Figure 1: SERVIR WA Results Framework



3.0 SERVICE PLANNING FRAMEWORK

The SERVIR WA program strategy focuses on four priority countries—Niger, Ghana, Senegal, and Burkina Faso—with a broader mandate to consider needs across the West Africa region. During initial consultations as well as engagements during the start-up phase of the project, SERVIR WA has become aware of the potentially rich network of users, centers of expertise, and existing initiatives in the region who are already engaged in the development of products and services related to the SERVIR thematic service areas. SERVIR WA will seek to address the challenge of harnessing the energy generated by these efforts and actors in a synergistic fashion in order to multiply value, empower local expertise, and effectively direct science applications to decision makers at multiple levels.

SERVIR West Africa fully embraces the newly drafted Service Planning Framework, which is being implemented throughout the SERVIR Global community. SERVIR WA is adapting these tools to the unique context found in West Africa and will broaden the approach to fully embrace the concept of co-development of products.

The approach adopted by SERVIR West Africa follows three steps: (i) consultation and needs assessment, (ii) service design and delivery and (iii) monitoring, evaluation and learning (MEL). The SERVIR WA hub is organized into two teams: one primarily responsible for user engagement, and a second responsible for science and data. In reality, these two teams act as one, focusing on geographic and thematic issues.

CONSULTATION AND NEEDS ASSESSMENT

In the first stakeholder consultation conducted in the pilot countries in August 2016, almost two dozen potential services were identified across the four service areas: food security and agriculture; water and water-related disasters; land cover and land use change and ecosystems; and weather and climate. The PCU and the broader hub reviewed preliminary requests from stakeholders and will undertake further consultations, as part of this work plan, to improve understanding of needs and priorities for SERVIR WA services. These follow-up consultations will focus on a deeper analysis of needs, interest, and buy-in for services. SERVIR WA will gather additional information about the context for services; identify opportunities to build on existing efforts where possible; account for the roles of different information users and providers; and assist in further prioritizing potential services. Terms of reference for stakeholder mapping efforts will be drafted. SERVIR WA will train consortium members to participate in further stakeholder mapping efforts linked to the three topical service areas that were defined during the annual work planning process.

The stakeholder mapping effort, in addition to helping to define service requirements, will enable the user engagement leads create a database of end-users, partners, and beneficiaries. The database will assist in monitoring the growth of SERVIR WA's service network, a network that can also be mapped graphically. This graphical mapping effort will provide statistics, which will serve to partially demonstrate SERVIR WA's progress in reaching beneficiaries, development of end user and partner capacity, and show the overall spread of the SERVIR WA network within the region. The stakeholder mapping effort will transform the development problem statement into a Theory of Change. The Theory of Change will serve to identify key interventions where services (data, tools, product, platforms and/or training), co-developed by SERVIR WA or other regional actors, will aid in addressing the development problem. Relevant technical partners, identified through the stakeholder mapping process will form the service design team (SDT) that will undertake development of the appropriate services required.

Additionally, SERVIR WA will assemble a peer reference group (PRG), consisting of consortium members, relevant members of the NASA AST, and regional experts, for each service activity. This group will provide peer review of the effort and supplement end-user consultations. Through these forms of multiple feedback, SERVIR WA will support the scientific validity of any service as well as its usability and sustainability.

SERVICE DESIGN AND DELIVERY

SERVIR WA will use the SERVIR Global Service Design Tool with certain modifications. The overall outputs of the service design process followed will mirror those contained in the Service Design Framework. The process will follow a workflow that allows for regular review by end-users and peers, while ensuring that duplications of effort from other regional efforts are avoided using baseline assessment information collected during the stakeholder mapping activity. The SDT will be responsible for drafting the design concept paper and subsequent definition documents, with review and concurrence from the PRG as well as the end-users involved.

This workflow will continue through a rigorous design and testing phase, again reviewed by the PRG and end-users. This design phase will initially end when a usable version is developed, though it may be re-initiated to develop further versions as end-users demand.

Service delivery to the targeted end-user represents step in the process, however it does not stop with delivery. The service will also be openly accessible to the broader community. It will be posted on the SERVIR WA portal and end users will be encouraged to post it on their websites as appropriate. These services will form an essential part of the SERVIR WA catalogue. Any data generated as a result will be part of the SERVIR WA portal, documented according to SERVIR data guidelines, and made available to USAID in compliance with ADS 579.

MONITORING, EVALUATION, AND LEARNING (MEL)

Monitoring, evaluation, and learning will align with the SERVIR theory of change. By its design, the theory of change will clearly identify end-states against which progress can be measured. Key assumptions included in the theory of change will also be monitored. The MEL plan for each service will be used to create alignment of the services with the project monitoring plan presented in later sections of this work plan. In addition to specific indicators of progress and quality, end-user feedback will be elicited, thus providing qualitative as well as quantitative data to drive the evaluation process. Ultimately, the monitoring and evaluation effort will inform further iterations of specific services as well as future services delivered. Through this process, the project will facilitate true learning.

At the center of the SERVIR WA approach to services is an integrated approach to service design, development, and distribution. The integrated design specifies a user-defined problem statement to services (tools, training, platforms, and products). Users, regional partners, and NASA SCO are all integral partners in the co-production process. A four-phase process is initiated with specific user engagement exercises. End-user feedback is elicited throughout the process and a peer service design (PSD) group is created for each service design effort. This approach is adaptable for small and large interventions alike.

3.1 SERVICE AREAS

SERVIR WA has begun to assess service needs, initially through user consultation workshops in the four focal countries, in several thematic areas including food security and agriculture; water and water-related disasters; land cover and land use change and ecosystems; and weather and climate. In FY17 SERVIR WA will prioritize at least one of these thematic areas for service development. Specific service delivery will be designed through continued user engagement, stakeholder mapping and service delivery

design, which will focus on stakeholders directly engaged in the context of the development problem statements, as described below.

3.1.1 AGRICULTURE AND FOOD SECURITY

Agriculture is the main occupation in West African rural areas, where the majority of the population lives, and climate change poses serious threats to the agricultural and food systems of the region. Prolonged droughts, more frequent weather extremes, and crop failure continue to challenge West Africa. Agriculture is a dominant force in the region's economies, accounting for 35 percent of gross domestic products (GDP), more than 15 percent of exports, and 65 percent of employment. An estimated 60 percent of the rural population has depended mostly on agriculture for sustenance, and rural areas are historically the poorest. Food insecurity has been chronic in many countries across the Sahel. Agriculture has featured prominently in national development programs through several generations of Poverty Reduction Papers and related priority action plans. The region has over thirty years of experience in monitoring and mapping agriculture and food security. Users continue to request assistance, particularly in predicting and increasing the resolution of seasonal outcomes and food security issues. Possible collaborations in this theme are being explored, and include the Famine Early Warning Systems Network (FEWSNET) as well as hydrogeological monitoring and early warning services for determining drought and a variety of climatological services such as those developed in East Africa by the Regional Centre for Mapping Resources for Development (RCMRD). The participants in the national user engagement workshops identified timely and precise crop forecasting as a critical problem. Globally, SERVIR has contributed to improved crop forecasting and AGRHYMET has extensive experience in contributing to regional forecasts. NASA's provision of high-resolution imagery and creation of algorithms that enable rapid evaluation of agricultural conditions (vegetation, soil moisture, climate, and water access) may serve to extend the forecast period and improve spatial resolution. SERVIR WA's data and visualization platform can increase accessibility to data and products. Work with users can improve the dissemination of this data through such media as mobile technology and other forms of ground data collection may be explored.

3.1.2 LAND COVER AND ECOSYSTEM MANAGEMENT

Landscape management has presented major challenges and opportunities throughout West Africa. It is critical to a region where the vast majority of the rapidly growing population heavily depends on ecosystem products and services. The West African economy continues to rely heavily upon its natural resources for development, and resilience to climate change requires keen knowledge of the land cover dynamics associated with these resources. West African countries are experiencing change at many levels—climatic, agricultural, demographic, political, and socioeconomic. As a result, a growing number of major challenges threaten the region. These include high climatic variability, rapidly growing populations and climate-driven land use, and human and land cover changes that result in considerable pressure on the fragile resource base. Environmental changes are predicted to accelerate, with unknown and potentially serious implications for both the people and environment of West Africa. The drivers of change are complex and knowledge of West Africa's resource-rich areas remains limited. Considerable research has been carried out on the dynamics and drivers of this change. However, continuing demand is expressed at national levels for greater precision in spatial and temporal terms. Further, as geospatial science and information is increasingly used in the development of national land management plans, high resolution and high levels of differentiation in land use increases in importance. West Africa has benefited from considerable capacity development in the analysis of land cover and land use, and this has increased the demand for more sophisticated analytical tools, improved platforms for dissemination, and extension of this information to a broader audience. A variety of geospatial tools, such as the greenhouse gas emissions inventory tool developed by ICIMOD / SERVIR Himalaya in collaboration with Colorado State University and the forest carbon assessment tool for REDD+, are being reviewed that

could inform land management for reducing emissions from land use change as well as forestry to reduce GHG emissions in the region. Regional scientists have also expressed their desire to see greater harmonization among the various approaches to land classification, particularly as it approaches small scale. SERVIR has collaborated with a number of research organizations and governmental agencies globally in land use/land cover change. A number of tools may be adapted for regional needs. National and regional agencies, particularly members of the SERVIR hub, have a high level of experience and capability to address user needs. SERVIR's high-resolution data access, previously developed tools, and data and information platform provide SERVIR WA with a unique position to add value to this area. To the extent possible, SERVIR WA will seek synergies with the USAID-supported SilvaCarbon initiative, which the SERVIR SCO is also supporting. Three members of the PCU will attend the SERVIR SCO SilvaCarbon initiative meeting in Huntsville, AL in February 2017.

3.1.3 WATER RESOURCES AND HYDROCLIMATIC DISASTERS

Disaster resilience and preparedness are also major challenges in West Africa with increasing extreme climate events and corollary natural disasters such as floods, droughts, bush fires, and coastal erosion. Geospatial technologies and forecasts can be used to improve disaster resilience. Although the region is perhaps most noted for its periodic droughts, the region contains a vast system of watersheds fed by five major water systems. Flooding has been a major issue in recent years, particularly in 2016, with a significant loss of property, infrastructure, and several hundred lives. As urbanization increases, flooding in urban areas becomes a major issue. Each of the major river systems (Volta, Senegal, Gambia, Mano, and Niger) have interstate governing bodies and a number of dam projects are currently underway (some dams have already been built in the Senegal, and Volta river basins). Opportunities to adapt SERVIR services from other regions to predict floods in cooperation with the Niger River Basin Authority are under review (e.g. CREST modeling being done at the SERVIR East and Southern Africa Hub). Other opportunities may include water management including hydropower, irrigation, navigation, water supply, disease control, and maintenance of environmental products and services for the Niger, Volta, Gambia, Mano, and Senegal River Basins, and the Lake Chad Basin. SERVIR has broad global experience in flood and water monitoring, particularly in Eastern and Southern Africa, and the Himalayas. Several models, data and information platforms, and dissemination approaches have been developed and may be adapted to regional needs of West Africa. These include the BRICKS Knowledge Platform, the CILSS/AGRHYMET Climate Change and Sustainable Land Management Data Portal, and the AGRHYMET Data Library. The primary focus of any service development will be guided by regional and local decision needs, early warning, forecasting, and basin management requirements.

3.1.4 WEATHER AND CLIMATE

Weather and climate data records in West Africa, and much of Africa, are incomplete and data collected is not always managed, shared, and analyzed to produce information and knowledge in order to effectively inform food security and agriculture; water and water-related disasters; land cover and land use change and ecosystems; and weather and climate. Currently, reporting from ground-based stations is infrequent. Ground-based stations are in disrepair and the number of weather stations presently is about half of what was present during the colonial era. This lack of a robust regional network has been supplemented by increased reliance upon the constellation of weather satellites such as Global Precipitation Measurement, (GPM), the Meteosat satellites, Tropical Rainfall Measuring Mission (TRMM), and others. Seasonal outlooks are provided, but they lack the spatial and temporal resolution that may allow for critical local decisions.

Successful risk management in these sectors requires provision of climate and weather information at the right time and in useful formats. SERVIR WA is looking at needs for tailoring climate information appropriately for the national to local scales, which is critical, as well as aligning the timescales of

information with the timescales of decision-making. Improving the modeling and forecasting capacity of hydro-meteorological agencies as well as improving their engagement with sectoral ministries can help a) provide more accurate, timely, and actionable real-time warnings; b) generate more useful seasonal forecasts; and c) increase the relevance and potentially reduce uncertainty of longer-term impact projections. SERVIR has considerable experience globally in this area and AGRHYMET, ACMAD, and ICRISAT have considerable capacity in generating regional weather forecasts. SERVIR also has approaches that can make this information more accessible to authorities and communities through various platforms, websites, mobile applications, etc. Reliable, timely, and accessible information feeds into advisories on flood prediction, crop production, and provision of such information directly to farmers. Further, effective national and regional climate modeling is required for the development of effective resilience and adaptation plans, particularly as called for by various international agreements. Columbia University International Research Institute for Climate and Society (IRI) will carry out an applied science effort as part of their grant from the AST. This effort will be aligned with user needs as they are further identified through stakeholder mapping efforts.

4.0 YEAR 1 ACTIVITY PLAN

The SERVIR WA hub recognizes the need for intensive user engagement to support design and development of priority services in the first year. The hub members have each participated (with the exception of RECTAS) in stakeholder consultations held in Niger, Ghana, Senegal, and Burkina Faso between July 27 and August 12, 2016, to assess and understand the service area needs at the local, national, and regional levels (see Annex A). The series of workshops held over the two-week period (two days for each workshop) brought together an average of 20 participants from different institutions to discuss needs. Participants included government representatives, civil society, and nongovernmental and private sector stakeholders. Although USAID programs were invited to participate, additional outreach and discussions will be conducted in the first year to understand the possible need and scope for services that SERVIR WA can provide to USAID-funded programs in the region.

A collaborative work planning workshop with SERVIR WA PCU, consortium members, and project partners as well as findings from stakeholder consultations have informed proposed activities for project Year 1. This section describes the major activities to be carried out during Year 1 toward achieving intermediate and sub-intermediate results that support the overall SERVIR WA program objectives and to complete required tasks.

4.1 PROGRAM ACTIVITIES

IR 1: IMPROVE THE INSTITUTIONAL CAPACITY OF AGRHYMET TO PROVIDE REGIONAL SERVICES AND PLAN FOR SUSTAINABILITY OF SERVIR WA

SERVIR WA will focus on strengthening the sustainable capacity of AGRHYMET to provide tailored earth observation and geospatial information services in the four service areas in Niger, Ghana, Senegal, and Burkina Faso. Critical to understanding this capacity will be the tailored self-assessments carried out by AGRHYMET and hub members in cooperation with the Support Team and the PCU. This self-assessment will strengthen baseline understanding of organizational strengths and needs and contribute to the CILSS / SERVIR capacity building efforts for AGRHYMET and hub members. Based on the self-assessment at AGRHYMET, the PCU will provide support to CILSS in the preparation and implementation of a work plan for the re-engineering of administrative, financial and operational processes.

The project will establish Memoranda of Understanding (MoUs) with each consortium member. The MoUs will detail support provided in order to improve consortium members' capabilities in service planning, design and delivery.

In addition, a communications and outreach strategy will be developed and progress toward program objectives will be monitored.

Sub-IR 1.1 – Partnerships and Exchanges Established

Activity 1: MoUs Established with Hub Members

> AGRHYMET will establish MoUs with each of the hub institutions that build on their current agreements. These MoUs will support long-term collaboration on the implementation of SERVIR WA.

Activity 2: SERVIR Annual Global Exchange (SAGE) Participation

The SERVIR WA hub will travel to Pokhara, Nepal October 24 – 28, 2016 to attend the SERVIR Annual Global Exchange (SAGE). Although SERVIR WA is early in its first year of implementation, hub members will contribute to different sessions and presentations.

Activity 3: SERVIR Hub Exchanges Held

The PCU anticipates holding exchanges with other hub members and with another regional hub, likely RCMRD, to learn and integrate best practices in one or more thematic service area.

Sub-IR 1.2 – Technical Capabilities Improved

Activity 1: Self-Assessment of Technical Capacity

The PCU will pilot the self-assessment of capacity at AGRHYMET with assistance from the Support Team. This participatory self-assessment will be followed by a facilitated focus group discussion to help AGRHYMET identify capacity needs. A report will be provided to AGRHYMET so they can identify gaps and prioritize capacity-building needs. Based upon requests, the SCO, CIESIN, and/or Support Team will be available to support AGRHYMET capacity building in identified technical and organizational capacity areas. For example, SERVIR WA partnership with NASA on the SilvaCarbon program will contribute to improving AGRHYMET's capacity to support the implementation of the NDCs of CILSS member countries. The self-assessment will then be expanded, as requested by hub members, under AGRHYMET's leadership to other hub members.

Activity 2: AST Coordination within Larger SERVIR WA Scope

During FY2017, the co-Leads for Science and Data will establish a regular communication channel to support coordination and effective communication with AST co-Principal Investigators (PIs). During follow-up consultations with service end-users, the PCU will engage AST co-PIs to support harmonization of research with the parallel service planning priorities identified by the PCU as part of the broader SERVIR WA scope. Additional research support may be needed/provided by/to AGRHYMET or hub researchers supporting any of the four technical projects as feasible within the SERVIR WA budget.

Sub-IR 1.3 – Organizational Capabilities Improved

Activity 1: Communications and Outreach Strategy Developed

This strategy will support raising of awareness and generate demand for SERVIR WA services through consistent and integrated messaging across SERVIR WA activities and through tailoring of service inputs, outputs, and key messages for stakeholders identified during the consultation process. This plan will be developed and implemented by the AGRHYMET communications team with support from Tetra Tech. The Support Team will assist reviewing the strategy, once the English version has been produced, and providing technical assistance during the appropriate hub exchanges.

Activity 2: Support on AGRHYMET Grant

Tetra Tech will provide direct support to assist AGRHYMET on compliance with USAID policies and procedures related to their grant and eventually sub-granting of funds to CERSGIS, RECTAS, CSE, ACMAD, and/or ICRISAT. This support will have a narrow focus, primarily supporting needs identified by the PCU to ensure sustainability of SERVIR WA and meet USAID requirements for management and administration of grants under contract, procurement, and related capacities.

Activity 3: Organizational Self-Assessment and Action Plans for Hub Members

Based upon demand, Kanava will tailor the organizational self-assessment and support hub members as requested to develop action plans to support sustainability of SERVIR WA.

Activity 4: Support for CILSS on AGRHYMET Re-engineering

SERVIR WA will seek close collaboration with the CILSS Management Support Unit (MSU) for the planning and implementation of the capacity building and re-engineering activities at AGRHYMET. SERVIR WA will support CILSS MSU in targeted capacity building that aims at aligning AGRHYMET to international management standards of regional institutions. For example, SERVIR WA will support the MSU in seeking AGRHYMET's accreditation to the Green Climate Fund. Such accreditations will help increase the managerial and financial sustainability of AGRHYMET as a regional institution.

IR 2: PROVIDE SUPPORT TO AGRHYMET AND PARTNERS TO IMPROVE CAPACITY OF ANALYSTS AND DECISION MAKERS TO USE GEOSPATIAL INFORMATION, INCLUDING CLIMATE INFORMATION, THROUGH DEDICATED CAPACITY BUILDING AND TRAINING PROGRAMS

The results of the capacity self-assessment by AGRHYMET and the hub members as well as results of the stakeholder consultation and mapping process will identify capacity-building and training needs across all service areas. These needs will be met through training conducted by consortium members, the SCO, CIESIN/IRI, and/or other partners.

Sub IR 2.1: Capacity Needs and Opportunities Identified

Activity 1: Baseline Capabilities Identified

SERVIR WA will assess regional needs for training through follow-up stakeholder consultations and the tailored self-assessment process with supplemental questions, led by AGRHYMET. Training requirements will be designed using the SERVIR Training Design Document (TDD) process The PCU will assess capacity needs in the four pilot countries to develop a shared understanding of baseline capabilities and needs for training to achieve the expected project results (IR 2, 3 and 4).

Activity 2: Geospatial Information Technology Capabilities Assessed

West Africa suffers from a lack of cost-effective and affordable Geo-Information Technology (GIT) infrastructure. AGRHYMET, in particular has limited and unreliable internet capabilities coupled with frequent power cuts that hamper its effectiveness as a regional data and information provider. During the first half of FY 2017, SERVIR WA will assess AGRHYMET's GIT requirements and capabilities. This will be combined with an assessment of the other consortium members GIT capabilities through the support of the SERVIR support team. As a result of these efforts, a clear roadmap to achieve effective GIT infrastructure and a design of the SERVIR WA data platform will be developed.

Sub IR 2.2: Capacity Building and Training Delivered

Activity 1: Training and Capacity-Building Plans Developed

Following completion of the training and capacity-building needs studies, the PCU with CIESIN staff and the SCO will work with AGRHYMET and other hub members to develop plans for the delivery of training and capacity building as identified and in relation to services to be

delivered by SERVIR WA. These plans will draw upon the training strengths of individual hub institutions to put regional expertise at the forefront of training and capacity-building activities.

Sub IR 2.3: Science-Policy Exchange Supported

Activity 1: Practitioner to Policy Dialogues Supported

SERVIR WA will organize side events to major sub-regional events that gather current and potential users of geospatial data, tools, and products. The seasonal forecast meetings organized by AGRHYMET and the meeting of the Network for Prevention of Food Crises with additional opportunities to be identified.

SERVIR WA also anticipates participating in the annual CILSS Coordinating Council Meeting, USAID regional cooperating partners meeting held in Ouagadougou, Burkina Faso, and at least one Economic Community of West African States (ECOWAS) event.

SERVIR WA will support the CILSS/AGRHYMET delegation participating in the relevant and selected global processes including multilateral environmental agreements (MEA) – such as the conventions on climate change, desertification, and biodiversity). This will promote the use of geospatial products and services into major national planning processes (e.g. National Adaptation Plan, Nationally Determined Contribution, National Adaptation Plan alignment) recommended by these conventions to the countries for promoting sustainable development.

SERVIR WA will also participate in relevant, and well-targeted, professional conferences and workshops dealing with the four service areas as well as geospatial information. Participation in these events will be assessed in terms of their opportunities to build capacity, strengthen regional collaboration, and further enhance service development.

The African Global Earth Observation System of Systems Africa (AfriGEOSS) is another network relevant to SERVIR WA in which hub members will seek to become more active. As an initial activity, SERVIR WA will support AGRHYMET's subscription to AfriGEOSS.

IR 3: PROVIDE SUPPORT TO AGRHYMET AND PARTNERS TO IMPROVE AWARENESS AND ACCESS TO GEOSPATIAL DATA, PRODUCTS, AND TOOLS THROUGH APPROPRIATE PLATFORMS

During FY 2017, SERVIR WA will inventory existing geospatial data, tools and services across the region, as well as the requirement for accessing these products and the gaps in the resources needed to support development decision-making. Improved understanding of data and information sharing and standards will inform the development of the Data Access and Sharing Strategy for the hub, based on the SERVIR Data Policy. This will further be supported through preparation of the SERVIR WA website and data sharing platforms.

Sub IR 3.1: Data, Products and Tools Awareness and Access Needs and Opportunities Identified

Activity 1: Inventory of Existing Geospatial Information Available in Region

SERVIR WA will use follow-up consultations to identify and inventory institutional geospatial resources within the hub and other institutions across the region that can be readily shared. From this assessment, gaps in geospatial information such as climatological data or high-resolution imagery will be identified and priorities for improved sharing will be developed.

SERVIR WA team members will participate in relevant conferences and workshops to exchange and encourage collaboration on GIT.

Sub IR 3.2: Practices for Data, Products, and Tools Sharing Improved

Activity 1: Assessment and Development of GIT and KM Plan (using Service Planning Process)

During the second quarter of FY 2017, a mission from the SCO will carry out a detailed evaluation of the institutional GIT capacity of the consortium members in collaboration with CILSS/AGRHYMET and prepare a proposal for a GIT plan. This will inform the preparation of the SERVIR WA Knowledge Management Plan.

Activity 2: Support Regional GIT dialogues (in collaboration with the United Nations Economic Community for Africa (UNECA))

From the regional inventory of geospatial resources identified under sub IR 3.1 and data guidelines workshop under sub IR 3.2, the co-Leads for Science and Data, in close collaboration with consortium member Information Technology staff, will support the establishment of a regional open repository of geospatial datasets, metadata, and tools. They will promote open data access throughout the region, leading to development of a Data Sharing and Access Strategy. This Data Sharing and Access Strategy will include a plan for establishing regional access to a one-stop geospatial data and information portal housed at AGRHYMET and/or other hub members or regional institutions (according to the findings of the GIT assessment) and will define strategic opportunities for building collaborative relationships and agreements to promote data sharing and the development of spatial data infrastructure and standards.

Sub IR 3.3: Platforms for Data Products, and Tools Awareness, Access, and Analysis Strengthened

Activity 1: Begin Preparations for Regional Data Platform

The co-Leads for Science and Data, in close collaboration with consortium member ITs, will specify the requirements for a regional data platform. Based on the initial report from the GIT assessment. The Support Team, CIESIN, and SCO will support development of the SERVIR WA's platform, data portal, and data standards development.

IR 4: PROVIDE SUPPORT TO AGRHYMET AND PARTNERS TO PROVIDE SERVICES TO ADDRESS DECISION MAKERS' NEEDS IN AGRICULTURE, WATER, WEATHER AND DISASTERS, LAND USE, AND SUSTAINABLE MANAGEMENT OF COASTS AND FORESTS

The decision-making landscape in each of the four thematic service areas will be fully mapped to ensure SERVIR WA's focus on user-tailored geospatial products and tools is designed to inform decision-making. Through this ongoing process, a variety of stakeholders will be engaged in the co-development of geospatial decision-support tools. In addition, basic infrastructure needs for effective service design, development, and delivery will be addressed to support effective program implementation.

The SERVIR WA hub recognizes the need for intensive user engagement to support design and development of priority services in the first year. The hub members have each participated (with the exception of RECTAS) in stakeholder consultations held in Niger, Ghana, Senegal, and Burkina Faso between July 27 and August 12, 2016, to assess and understand the service area needs at the local, national, and regional levels (see Annex A). The series of workshops held over the two-week period (two days for each workshop) have used a demand-driven approach that puts the user at the front leading the process of defining requirements and defining the geospatial products and services that SERVIR West Africa will promote. The workshops informed the potential users about the SERVIR

products and services that might be feasible and generated interest on the part of the participants. More than 136 participants (38 in Niger, 35 in Ghana, 38 in Senegal and 25 in Burkina Faso) attended the workshops, representing a range of institutions (departments of technical ministries, civil society organizations, community based organizations, USAID, research institutions, etc...). Several African regional organizations were identified which are working to put in place modern geodesic reference grids in West Africa, including UNECA, and this creates an increased need for high-quality geospatial information. Findings of consultations have been used to inform the Annual Work Plan as well as the Monitoring and Evaluation Plan during the regional workshop for the design of the annual work plan of SERVIR WA held on end of August 2016.

Sub IR 4.1: Data, Products and Tools Needs and Opportunities Identified

Activity 1: Internet Connectivity at AGRHYMET

The SERVIR WA co-leads for Science and Data, with the support of the NASA GIT team, will conduct a needs assessment of internet requirements, including options for efficient data storage solutions, enhanced broadband capabilities to support data download and upload, as well as equipment and software needs to support SERVIR WA efforts. AGRHYMET has analyzed basic internet service needs and plans to engage a national service provider to provide high-speed, limited bandwidth internet connectivity in the short term.

Activity 2: Stakeholder Mapping and Database of Stakeholders Developed and Maintained

As an integrated component of the ongoing stakeholder consultation process, the co-Leads for User Engagement will conduct stakeholder mapping and an end-user database will be developed and updated regularly to track all the potential service users in a given thematic service area.

Sub IR 4.2: Tailored Tools and Products Co-developed

Since SERVIR WA is in its initial phase, it is too early to identify specific areas of tool co-development until further stakeholder mapping and consultations efforts are completed. Nevertheless, specific opportunities have been identified during the first round of stakeholder consultations.

Activity 1: Develop and implement the Service Planning Framework within the Hub

The PCU will develop a service planning approach, which details the process through which services will be provided once stakeholder consultations have completed identifying specific user needs. This model will be tailored and mainstreamed by hub members.

Activity 2: Further Review of Services Identified During Stakeholder Consultations

During the annual work planning workshop, the following three service areas were identified as priorities in the region:

(i) Land Cover Land Use Change Mapping/Ecosystems Including Forests and Rangelands.

Rural populations in West Africa, depend heavily on land resources. Land resource management is inadequate, land conflicts are on the rise, and there is an unsustainable use of land resources. The region is experiencing productivity losses owing to crop, rangeland, and forest degradation to meet both community and national analysis needs. Follow-up stakeholder consultations to validate the demand for services to address this need will be held in coordination with the relevant AST. For example, depending upon stakeholder consultations, SERVIR will co-develop services (in collaboration with other AGRHYMET units and consortium members) associated

with carbon sequestration and REDD+ requirements, land tenure and biodiversity conservation for ECOWAS/CILSS countries.

(ii) Water Resources Monitoring and Forecasting.

Reduced crop and livestock production due to insufficient surface and groundwater availability is caused in part by insufficient knowledge about available water resources. Follow-up stakeholder consultations to validate the demand for this service will be held in coordination with the relevant AST principal investigators. In addition, they may adapt their accepted AST proposal to address user-identified needs in the area of land cover change as it relates to climate variability as a result of stakeholder engagement. Depending on eventual needs, IRI has a strong background in flood monitoring and weather forecasting and can support this work. Mercy Corps' partnership with NASA/GODDARD Space Flight Centre for ground water monitoring offers an opportunity to link village-based needs to geospatial services co-developed among SERVIR West Africa's partners, NASA, and others.

(iii) Pest control as related to Agricultural Production and Food Security.

Agencies charged with pest control do not effectively target treatments in Burkina Faso and Niger. The resulting loss of crops and range quality affects food security, nutrition, health, and community economies. Follow-up stakeholder consultations will be held to coordinate with other related ongoing efforts and identify unique gaps that SERVIR WA could potentially fill. These consultations will be used to harmonize the AST efforts in this domain.

Sub IR 4.3: Uptake and Application of Tools Supported

Activity 1: Development of SERVIR WA Product Catalogue

As in Sub IR 4.2, above, specific means of support in the uptake and application of tools should not be defined until stakeholder mapping efforts have resulted in specific requirements. However, the initial version of the SERVIR WA product catalogue will be developed, which will be one element for supporting service uptake and application, as discussed under Sub-IR 3.3.

4.2 CROSSCUTTING ACTIVITIES

The PCU will also seek out opportunities for hub exchanges through support from SERVIR Global, regional exchange visits, regular collaboration between hub staff and institutions (see IR 1), and through the development of sustainable communities of practice identified by thematic leads within the hub. Crosscutting activities include activities that support the hub in service delivery and collaboration and coordination with a range of program partners. These include:

- Stakeholder consultations and mapping;
- Development and management of the user engagement database building on lessons learned from the Customer Relationship Management (CRM), in coordination with Support Team;
- Development of a SERVIR WA Communications and Outreach Strategy;
- Monitoring and evaluation of SERVIR WA performance toward program objectives: collaborating, learning, and adapting (CLA);
- Design, development, and operation of the SERVIR WA website;
- Addressing the issue of poor internet connectivity at AGRHYMET;
- Translation of most technical and program documents between English and French; and
- Engagement of women and youth in science and environmental education, for example through the Global Learning in Observations to Benefit the Environment (GLOBE) initiative.

5.0 COORDINATION WITH SERVIR GLOBAL AND OTHER PARTNERS

SERVIR WA is the newest member of the SERVIR family and anticipates close collaboration with the SERVIR SCO, the Support Team, AST, SERVIR East and Southern Africa, SERVIR Himalaya, and SERVIR Mekong.

Major areas of coordination and collaboration in the coming year include:

- Integration of best practices of the SERVIR Global experience with support from the SERVIR Support Team, particularly in the following areas:
  - Full internalization of the Service Planning Framework for service development to ensure SERVIR WA adequately gathers information about the context for services; builds on existing efforts to ensure complementarity; and accounts for the roles of different decision makers, information users, and other partners.
  - Internalization of the stakeholder mapping process to develop refined services that have greater buy-in and to ensure strong understanding of the service for the benefit of partners involved in the design and development process.
  - Development of the SERVIR WA Communications and Outreach Strategy with additional technical support from the Support Team. The PCU and consortium partners will work with the SERVIR Support Team to provide training in marketing material development, media engagement, public relations training, technical communication, and other aspects.
- SERVIR WA will regularly report relevant registration information, website visitors, and social media mentions, and other performance indicators to the SERVIR Global monitoring platform.
- Ensure purpose-driven monthly Hub Coordination Call with the USAID, SCO, and the Support Team where the team can discuss technical activities and support needs.
- Participation in quarterly thematic conference calls with other hub thematic leads to share and learn of common challenges across the four themes: food security and agriculture; water, weather, and disasters; land use; and sustainable coastal zone and forest management. One or two meetings will be held annually with a bi-monthly virtual meeting to maintain coordination and progress on user engagement and technical collaboration within the theme across the hubs.
- Co-Leads for Science and Data will establish and hold monthly coordination discussions with co-PIs from the ASTs to support integration and provide necessary support, as required.

6.0 GENERAL PROGRAM MANAGEMENT AND STAFFING

6.1 PROGRAM MANAGEMENT

SERVIR WA is implemented under a contract with Tetra Tech and with day-to-day management carried out by a Program Coordination Unit (PCU) made up of both AGRHYMET and Tetra Tech staff. The PCU is responsible for the overall management of the SERVIR WA activities at the program level.

The AGRHYMET co-Chief of Party (Mr. Issifou Alfari) is directly responsible for work plans of the co-Lead for Science and Data (Ms. Kadidiatou Yéro) and co-lead for User Engagement (Mr. Bako Mamane). AGRHYMET will also put in place MoUs with each hub member and eventually take responsibility for sub-granting with CERSGIS, CSE, RECTAS, ACMAD, and ICRISAT.

The AGRHYMET co-Chief of Party and the Tetra Tech Co-Chief of Party (Mr. Marc Dawson), are jointly responsible for managing the day-to-day technical implementation of SERVIR WA. The co-Chiefs of Party share management responsibilities for the Office and Logistics Specialist, communications office support, and vehicle driver.

The Tetra Tech Co-Chief of Party is also responsible for supervising the Tetra Tech Co-Lead for Science and Data, co-Lead for User Engagement, Finance, Grants and Operations Manager, Monitoring and Evaluation Specialist, and Finance and Administrative Assistant. The Tetra Tech Co-Chief of Party also coordinates and consults with the SERVIR WA Contracting Officer's Representative (Ms. Margaret McMorrow) at the USAID West Africa mission in Accra, Ghana and with the Tetra Tech home office Project Manager (Mr. Leif Kindberg), Deputy Project Manager (Ms. Tamara Coger), and other Tetra Tech home office staff. The hub is obligated to report biannually and annually as per USAID guidelines outlined in the contract. Contract deliverables are included in Annex C.

6.2 COMMUNICATIONS

The SERVIR WA hub will develop a SERVIR WA Hub Communications and Outreach Strategy, with technical support from the SERVIR Support Team. The finalized strategy will build demand for and awareness of SERVIR WA in a manner that ensures consistent messaging with broader SERVIR communications strategies while also reflecting local context to ensure sustainable uptake of SERVIR WA services. The strategy will support communications and outreach activities, and services to be co-generated with other hub members and end-users alike. Audiences may include donor-funded initiatives, technical users of geospatial information across the region, research institutions, NGOs, government decision makers, private sector organizations and companies operating in SERVIR WA's thematic areas (primarily in the agricultural or extractive sectors), organizations specializing in disaster/humanitarian issues, hub member staff and universities and academia, as well as USAID and NASA audiences. The SERVIR WA hub will map appropriate messaging, timing, and delivery tactics to each audience to establish effective messages and communication channels with guidance from the SERVIR Support Team.

6.3 MONITORING AND EVALUATION

SERVIR WA Monitoring and Evaluation (M&E) focuses on establishing robust systems for data collection, measurement, learning, and knowledge sharing on program performance indicators. Strong M&E system will be designed to support the program's ability to measure and support progress toward objectives, including measuring changes in individual knowledge, skills, and abilities; measuring changes in institutional capacity; and measuring impacts. The SERVIR WA M&E Specialist will work closely with

CILSS/AGRHYMET and Tetra Tech home office M&E expert to develop a relevant M&E system, which will facilitate field-based, real-time reporting and also guaranties data quality. Participation of the project team and hub member focal points will be important to ensure understanding of roles and responsibilities for data collection and reporting over the course of the project. Year 1 M&E activities will focus on collecting baseline data where appropriate and implementing the M&E system and processes to monitor progress toward LOP targets. Global Climate Change (GCC) standard indicators, which are current as of June 2016, as well as custom indicators will be used to track progress. Tracking these indicators will allow SERVIR WA to monitor organizational and technical capacity building activities and evaluate their outcomes.

Upon approval of the SERVIR WA Year 1 annual work plan, the PCU will finalize the SERVIR WA M&E plan in collaboration with SERVIR WA consortium members. Once all Year 1 planned activities are finalized, SERVIR WA will be able to establish realistic targets for Year 1 indicators, as well as the project's approach to M&E in Year 1. SERVIR WA will then hold a validation workshop for the Year 1 M&E Plan.

SERVIR WA will collect and include baseline data related to institutional capacity in the M&E plan, a process on which that the Year 1 M&E Plan will elaborate. The project will collect this baseline data through the capacity assessment of SERVIR WA consortium member institutions. The rollout of the capacity assessment activity is scheduled to begin during Quarter 2 of FY2017

In addition to baseline data collection for institutional capacity, SERVIR WA will collect baseline data in advance of training and capacity building activities to measure progress. The SERVIR WA M&E Specialist will conduct a pre-test for all trainings and capacity building at the beginning of each training session. The pre-test will serve as the baseline for the training. The SERVIR WA M&E Specialist will then conduct a post-test at the end of each training to measure the immediate change in the participants' knowledge. To measure the longer-term impact of the training on participants' knowledge, skills, and abilities, SERVIR WA may conduct follow-up surveys as appropriate to assess long-term impact as appropriate.

For SERVIR WA indicators not related to institutional or individual capacity, the baseline values for Year 1 are zero. In the first year of SERVIR WA, implementation and baselines surveys for other indicators are not required.

6.4 STAFFING

The PCU staff based at AGRHYMET includes the following:

Mr. Issifou Alfari, AGRHYMET co-Chief of Party is the principal institutional liaison between Tetra Tech and CILSS/AGRHYMET as well as the principal coordinator with hub institutions. He co-manages SERVIR WA activities with the Tetra Tech Co-Chief of Party.

Mr. Marc Dawson, Tetra Tech Co-Chief of Party co-manages technical activities and is responsible for a small team of Tetra Tech staff. He has overall responsibility for compliance on program activities (technical and administrative) outlined in the contract and will serve as the principal institutional liaison to USAID. He is also responsible for developing and implementing the sustainability plan for SERVIR WA.

Mr. Paul Bartel, Tetra Tech Science and Data Co-Lead works with his counterpart, **Ms. Kadidiatou Yéro, AGRHYMET Science and Data Co-Lead,** to jointly lead co-development of user-driven services with hub members and support data sharing. The co-Leads are the principal technical contacts with the NASA science team.

Mr. Saliou Ndoye, Tetra Tech User Engagement Co-Lead works with his counterpart, **Mr. Bako Mamane, AGRHYMET User Engagement Co-Lead**, to consult with and engage service users to understand their needs, develop user engagement strategies, and support other coordination and engagement activities with a variety of stakeholders in priority countries and across the region.

Mr. Rabilou Abdou, Tetra Tech Finance, Grants and Operations Manager is responsible for administrative and grants management under the SERVIR WA contract. He manages day-to-day financial and accounting activities for the program and works with the Tetra Tech home office to ensure financial policies and procedures are followed through all program operations.

Mr. Moussa Sayo, Tetra Tech Monitoring and Evaluation Specialist is responsible for maintaining the SERVIR WA's M&E Plan (MEP); managing the data collection and analysis process; and providing technical staff with regular feedback, information, and statistics that provide insight into the level of progress achieved and areas where more effort may be required to meet project objectives and targets. The M&E Specialist will work closely with the co-Chiefs of Party and technical teams, as well as hub member organizations, to establish the project's field-based M&E systems.

Mr. Moussa Djibril, AGRHYMET/Tetra Tech Office and Logistics Specialist supports program operations half time (anticipated) on day-to-day activities such as travel and logistics, events, inventory management, procurements, and others.

Mr. Papa Oumar Dieye, AGRHYMET Communications Specialist is anticipated to support SERVIR West Africa part-time where he will support communications and outreach activities. In this role he will work with Tetra Tech ARD staff to build demand for and awareness of SERVIR WA in a manner that ensures consistent messaging with broader SERVIR communications strategies while also reflecting local context to ensure sustainable uptake of SERVIR WA services.

Ms. Fatoumata Jean, Tetra Tech Finance and Administration Assistant provides Tetra Tech bookkeeping, records management, and related support on contractual and financial management activities.

7.0 ANNEXES

ANNEX A: EXECUTIVE SUMMARY OF STAKEHOLDER CONSULTATIONS

The SERVIR West Africa Program has consulted with its principal partners, by means of four national workshops held in Niger from July 27 through 29th, In Ghana on August 2 and 3rd, in Senegal on August 4 and 5th and in Burkina Faso on August 10 and 11th, 2016.

These workshops were organized by the consortium member institutions (AGRHYMET, CERSGIS and CSE), except in Burkina Faso, where no institution has been chosen for membership in the consortium. These workshops were held in conformity with the program's user engagement strategy, and support SERVIR WA's characterization of needs.

These workshops informed the potential users about the SERVIR products and services and generated interest on the part of the participants. More than 136 participants (38 in Niger, 35 in Ghana, 38 in Senegal and 25 in Burkina Faso) attended the workshops, representing a range of institutions (departments of technical ministries, civil society organizations, community based organizations, USAID, research institutions, etc...). Several African regional organizations were identified which are working to put in place modern geodesic reference grids in West Africa, including UNECA, and this creates an increased need for high-quality geospatial information. In this context, Senegal has formulated a National Geomatics Plan, which it is currently implementing.

Quality geographical information provides support for decision-making based on scientific evidence for the good of the population of the sub-region, within a framework of reasoned and sustainable development. Currently, geographical information systems are an essential tool for the management of this information and the optimization of land use, natural resources and socioeconomic infrastructure. Even more strategically important that the geospatial products and services available permit monitoring and anticipating certain climatic which have serious negative impacts security and economic development in the sub-region.

An important partnership exists between these countries linking national and international structures. Initiatives are underway in certain areas of investigation, which are of interest to SERVIR, but they gaps and limitations, which the program will be able to address over time.

These workshops have also permitted the identification of the needs for geospatial products and services as a result of the work of sub-groups and a questionnaire which were analyzed and discussed during plenary sessions; (i) identified problems, (ii) work in progress, (iii) gaps and limitations, (iv) opportunities offered by SERVIR, (v) strategic partnerships and finally (vi) analysis of strengths, weaknesses, opportunities and threats. The participants were informed that, while certain needs can and will be addressed by the SERVIR West Africa team during the current year, others will require more time because they will be the objects of research in partnership with NASA. The problems identified are the results of current climate change and the solutions proposed will be within the framework of the resilience of the populations. The following summaries of each workshop outline the needs identified during the national consultation workshops:

July 27th and 28th, 2016, Centre Régional AGRHYMET (NIGER)

In Niger, the expected contribution of the SERVIR program in the area of food security will be to permit the monitoring of the extreme variations in precipitation (droughts and flooding) and eventual locust invasions. In the area of water resources, understanding the potential water availability in the country requires that a better understanding geographical distribution to permit better demand planning (especially as concerns subterranean water). As far a climate and weather are concerned, more precise forecasting of climate phenomena in terms of intensity and location. Finally, it was revealed that the topographic mapping needed to support an adequate land use policy is out of date. It will be necessary to make use of SERVIR to provide updated mapping.

August 2nd and 3rd, 2016, Accra City Hotel (GHANA)

The conclusions from the Ghana User Engagement Workshop emphasized the need for real-time monitoring capabilities and training in the use of high-resolution imagery, modeling and mapping. The Land Cover/Land Use Working Group emphasized the need for real-time monitoring of land use/land cover (LULC) for agriculture, urban mapping and biodiversity. In particular, the LULC working group identified the need for standardization of land classification schemes and methodologies for mapping. The Water Resources and Natural Disasters working group identified hydrological modelling, flood early warning and forecasting with models and imagery, and mapping of ground water resources as well as mapping water quality and invasive aquatic plant species. The agriculture and Food Security Working Group identified the need for a district-level food security and crop monitoring system that enables crop yield and area estimation, crop suitability and soil moisture mapping, and small-holder decision support tools. The Weather and Climate Working Group identified the need for training in the use of imagery-based precipitation estimates, data collection protocols for monitoring air pollution in urban areas, and the ability to assess the temporal and spatial impacts of climate variability in terms of vulnerability and adaptation. In general, the 28 participants in the workshop called for greater harmonization and enhancement of data infrastructures, coordination between the various initiatives that touch upon SERVIR themes, and enhanced computing power for modelling and data analysis.

August 4th and 5th, 2016, Centre de Suivi Ecologique, Dakar (SENEGAL)

In Senegal, the SERVIR program can assist in the implementation of a cartographic database (scale 1/50,000 and elevation at 1 meter), to reinforce the national geodesic system within the framework of the National Geospatial program. In the area of ecological monitoring of ecosystems, high precision thematic maps can be produced to help understand their current state as well as monitor their evolution. For monitoring food availability in the country, multiple products and agricultural climate services could be

developed. Air quality forecasting services in urban areas of Senegal could also be developed.

August 10th and August 11th 2016, d'Hôtel Pacific, Ouagadougou (BURKINA FASO)

The participants in the Burkina Faso workshop expect to better understand both surface and subterranean water resources in the country, The Communal Development Plans are the planning tools which must be updated regularly; SERVIR will be asked to update the commune land occupation and utilization maps every 5 years, as well as those for certain ecological zones. As concerns weather and climate, it is expected that there will be an increase in the quality of the forecasting in order to ensure that the results will be satisfactory to the population. Finally, with regard to food insecurity, special emphasis should be put on the monitoring of extreme conditions (drought and flooding), as well as other negative factors affecting crops.

As well as these national priorities, other needs which at the regional level should be addressed. This especially includes the improvement of internet connectivity for the principal members of the consortium, strengthening the capacities of the data analysis centers in the sub-region, increased collaboration between research projects by means of collaborative efforts, as well as harmonization of the regulatory frameworks for management of climate information and data.

Other activities proposed, included the following:

- Formalize agreements between consortium partners (CSE, CERSGIS, RECTAS, ACMAD, and ICRISAT) which clarify their roles and responsibilities.

- Identify an institution to coordinate program activities in Burkina Faso.

- Support for implantation of the use of the French language as the working language in francophone countries.

ANNEX B: ACTIVITY SCHEDULE

Activity	Tasks	Quarter											
		Quarter 1			Quarter 2			Quarter 3			Quarter 4		
Task 1 (IR 1): Improve the institutional capacity of AGRHYMET to provide regional services and plan for sustainability of SERVIR WA													
1.1 MoUs Established with Hub Members	Establish MoUs to support long-term collaboration on SERVIR WA implementation					■							
1.2 SERVIR Annual Global Exchange (SAGE) Participation	SERVIR WA hub will attend SAGE	■											
1.3 SERVIR Hub Exchanges Held	Hold exchanges with other WA hub members and another regional hub (RCMRD)					■	■	■		■	■		
1.4 Self-Assessment of Technical Capacity	Pilot self-assessment of capacity at AGRHYMET							■	■				
1.5 AST Coordination within Larger SERVIR WA Scope	Host kick-off meeting with AST PIs and establish regular communication channel to support coordination and effective communication with AST co-PIs		■		■		■		■		■		
1.6 Communications and Outreach Strategy Developed	Support awareness raising and generate demand for SERVIR WA services through consistent and integrated messaging					■	■						
1.7 Support on AGRHYMET Grant	Direct support through subcontractor Kanava to assist AGRHYMET						■	■			■	■	
1.8 Organizational Self-Assessment and Action Plans for Hub Members	Tailor organizational self-assessment and support hub members CSE, CERSGIS, ACMAD and ICRISAT as requested to develop action plans for sustainability of SERVIR WA								■	■	■		
Task 2 (IR 2): Provide support to AGRHYMET and partners to improve capacity of analysts and decision makers to use geospatial information, including climate information, through dedicated capacity building and training programs													
2.1 Baseline Capabilities Identified	Undertake sectoral studies in four priority countries to develop shared understanding of baseline capabilities and needs for training							■	■	■			
2.2 Practitioner to Policy Dialogues Supported	Organize side events to major sub-regional events that gather current and potential users of geospatial data, metadata, tools and products							■			■		
Task 3 (IR 3): Provide support to AGRHYMET and partners to improve awareness and access to geospatial data, products, and tools through appropriate platforms													

Activity	Tasks	Quarter											
		Quarter 1			Quarter 2			Quarter 3			Quarter 4		
3.1 Inventory of Existing Geospatial Information Available in Region	Inventory institutional geospatial resources within hub and other institutions across region that can be readily shared												
3.2 Data Guidelines Workshop	Hold regional workshop(s) of key stakeholders to present SERVIR data guidelines and discuss means for harmonizing these with other data standards currently applied in region												
3.3 Data Sharing and Access Strategy Drafted	Develop Data Sharing and Access Strategy that includes plan for establishing regional access to a one-stop geospatial data and information portal												
3.4 Begin Preparations for Regional Data Platform	Develop plan for regional data platform housed at AGRHYMET or other hub members												
Task 4 (IR 4): Provide support to AGRHYMET and partners to provide products and services to address decision makers' needs in Agriculture, Water, Weather and Disasters, Land Use, Coasts, and Forests sustainable management													
4.1 Internet Connectivity at AGRHYMET	Conduct needs assessment of internet requirements, including options for efficient data storage solutions, enhanced broadband capabilities to support data download and upload, and equipment and software needs to support SERVIR efforts												
4.2 Stakeholder Mapping and Database of Stakeholders Developed and Maintained	Complete stakeholder mapping process and developed end-user database												
4.3 Operationalize the Service Planning Framework within the Hub	Hub members adopt the service planning approach as service planning begins												
4.4 Further Review of Services Identified During Stakeholder Consultations	Apply service planning framework to preliminary list of country priorities including Land Cover Land Use Change Mapping/Ecosystems including Forests and Rangelands; Water Resources Monitoring and Forecasting; Agriculture Production and Food Security (if determination to move forward is made)												

ANNEX C: DELIVERABLE TRACKER

SERVIR West Africa Activity

USAID Contract No. AID-OAA-I-13-00058/AID-624-TO-16-00001

Contract Signed 3/21/2016

Deliverables Tracker

No.	Report/Deliverable Title	Date Due	Revised Due Date (if any)	Date Submitted	Date of USAID Comments (if any)	Date of Final Submittal (if any)	Date Approved	Notes
1	Quarterly Accruals Report (FY 2016/Q4)	15-Jun-16		14-Jun-16			NA	
2	Branding and Marking Plan (BMP)	15-Jun-16					1-Sep-16	
3	Crisis Modifier Plan	21-Jun-16		21-Jun-16	21-Jul-16	6-Sep-16	22-Sep-16	
4	Three Month Work Plan (FY 2016)	21-Jun-16		21-Jun-16		30-Jun-16	30-Jun-16	A three month work plan was submitted within 90 days.
5	Monitoring and Evaluation Plan (MEP)	31-Aug-16	15-Sep-16	16-Sep-16				Extension granted to September 16.
6	Year One Work Plan (FY 2017)	31-Aug-16	15-Sep-16	16-Sep-16	10/14/16 & 1/30/17	2-Feb-17		Extension granted to September 16.
7	Quarterly Accruals Report (FY 2017/Q1)	15-Dec-16		14-Dec-16				
8	Success Stories	15-Oct-16						Up to four per month.
9	Mid-year Progress Report (FY 2017)	30-Apr-17						Submit early
10	Annual Report (FY 2017)	31-Oct-17						Submit early
11	SERVIR Grants Manual							
12	Quarterly Accruals	20 days prior to end of quarter						(1) Total amount obligated, (2) Total amount invoiced for, (3) Total amount expended but not yet invoiced for,
13	Final Report	ays prior to end of contract						

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