ADAPTATION FUND

REGIONAL PROJECT PROPOSAL

RICOWAS Project
Scaling-up climate-resilient rice production in West Africa

Benin, Burkina Faso, Côte d'Ivoire, The Gambia, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo

Title of Project:	**Scaling-up climate-resilient rice production in West Africa**	
Countries:	Benin, Burkina Faso, Côte d'Ivoire, The Gambia, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo (all countries members of ECOWAS)	
Thematic Focal Area:	Food Security	
Type of Implementing Entity:	Regional Implementing Entity (RIE)	
Implementing Entity:	**Sahara and Sahel Observatory (OSS)**	
Executing Entities:	**Regional level:** Regional Coordination Unit based at the **Regional Centre of Specialization in Rice sponsored by ECOWAS (RCoS-Rice/IER)** in Mali, in partnership with Climate-Resilient Farming Systems program at Cornell University, USA	
	National level: National Coordination Institutions	
	Benin	Secrétariat Général du Ministère de l'Agriculture, de l'Elevage et de la Pêche (SG/MAEP) / Institut National des Recherches Agricoles du Bénin (INRAB)
	Burkina Faso	Ministère de l'agriculture et des aménagements hydro-agricoles /Direction générale des études et des statistiques sectorielles
	Côte d'Ivoire	Ministère de l'Agriculture et du Développement Rural / Agence Nationale d'Appui au Développement Rural (ANADER)
	The Gambia	Ministry of Agriculture
	Ghana	CSIR-Savanna Agricultural Research Institute (SARI)
	Guinea	Institut de Recherche Agronomique (IRAG)
	Liberia	Community of Hope Agriculture Project (CHAP)
	Mali	Direction Nationale de l'Agriculture (DNA)
	Niger	Institut National de la Recherche Agronomique du Niger (INRAN)
	Nigeria	Agricultural Research Council of Nigeria (ARCN)
	Senegal	Agence Nationale de Conseil Agricole et Rural (ANCAR)
	Sierra Leone	Rokupr Rice Research Centre/Sierra Leone Agricultural Research Institute (SLARI)
	Togo	Institut de Conseil et d'Appui Technique (ICAT)
Amount of Financing Requested	14,000,000 in U.S Dollars Equivalent	

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ACRONYMS

3N	Les Nigériens Nourrissent les Nigériens - Initiative
AF	Adaptation Fund
AfT	Agenda for Transformation
AGRA	Alliance for a Green Revolution in Africa
ANCAR	National Agricultural and Rural Advisory Agency - Senegal
ANR	Agriculture and Natural Resources
ARCN	Agricultural Research Council of Nigeria
AWD	Alternate Wetting and Drying
BMZ	Federal Ministry for Economic Cooperation and Development of Germany
CAADP	Comprehensive Africa Agriculture Development Programme
CARD	Coalition for African Rice Development
CARI	Competitive African Rice Initiative
CC	Climate Change
CHAP International	Community of Hope Agriculture Project - Liberia
CILSS	Permanent Interstate Committee for drought control in the Sahel
CNS-Riz	National Rice Specialization Centre
COP	UN Climate Change Conference
CORAF/WECARD	Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricole / West and Central African Council for Agricultural Research and Development
CRCOPR /ROPPA	Network of Farmers and Producers of West Africa
CRRP	Climate-resilient rice production
DNA	National Directorate for Agriculture - Mali
ECOWAP	Regional Agricultural Policy for West Africa
ECOWAS	Economic Community of West African States
EIA	Environmental Impact Assessment
ESMF	Environmental and Social Management Framework
ESP	Environmental and Social Policy of the Adaptation Fund
FAO	Food and Agriculture Organization of the United Nations
FCIAD/FIRCA	Competitive Fund for Sustainable Agricultural Innovation
GIC	Green Innovation Centers
GIZ	German Gesellschaft für Internationale Zusammenarbeit
ICTs	Information and communication technologies
IE	Implementing Entity
IER	Mali's Institute of Rural Economy
IFAD	International Fund for Agricultural Development
IGA	Income Generating Activity
INDC	Intended Nationally Determined Contributions
INGO	International non-governmental organization
INRAN	National Agricultural Research Institute of Niger
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Pest (and disease) Management
IRRI	International Rice Research Institute
IVS	Inland Valley Swamps
JICA	Japan International Cooperation Agency
KAP	Knowledge, Attitude and Practices
LASIP	Liberia Agriculture Sector Investment Plan
LDCs	Least Developed Countries
LNRDS	Liberia National Rice Development Strategy
LuxDev	Luxembourg Agency for Development Cooperation
M&E	Monitoring and Evaluation
NAIP	National Agricultural Investment Plan
NAP	National Adaptation Plan
NAP	National Adaptation Plan
NAPA	National Adaptation Programmes of Action
NASPA-CCN	National Adaptation Strategy and Plan of Action on Climate Change for Nigeria
NDAs	National Designated Authorities
NDC	Nationally Determined Contributions
NEE	National Executing Entities
NEPAD	New Partnership for Africa's Development
NFs	National Facilitators
NGOs	Non-Governmental Organizations
NRDS	National Rice Development Strategy
NRDS/SNDR	National Rice Development Strategy/Stratégie Nationale de Développement du Riz
OSS	Sahara and Sahel Observatory – Observatoire du Sahara et du Sahel
PAPD	Pro-Poor Agenda for Prosperity and Development
PASANDAD	Accelerated Food Security and Nutrition for Sustainable Agricultural Development Plan
PDA	agricultural development policy
PNAR	National Rice Self-Sufficiency Program
PNCC	National Climate Change Program
PNCC	National Climate Change Policy
PNIASAN	National Agricultural Investment and Food Security and Nutrition Plan
PPPs	Public-Private Partnerships
PRACAS	Senegalese Agriculture Cadence Acceleration Program
PRODAM	Agricultural Development Project in Matam -Senegal
QA/QC	Quality Assurance and Quality Control
RAIPFNS	Regional Agriculture Investment Plan and Food Security and Nutrition
RCoS-Rice	Regional Center of Specialization in Rice - Mali
REE	Regional Executing Entity
RICOWAS	Scaling-up climate-resilient rice production in West Africa Project
RIE	Regional Implementing Entity
RSC	Regional Steering Committee
RTA-AP	Rice Transformation Agenda- Action Plan
SARI/ CSIR	Savanna Agricultural Research Institute - Ghana
SDDCI	Sustainable Development and Inclusive Growth Strategy
SG/MAEP	General Secretariat - Ministry of Agriculture Livestock and Fisheries -Benin
SLARI	Sierra Leone Agricultural Research Institute / Rokupr Rice Research Centre
SLWM	Sustainable Land and Water Management
SRI	System of Rice Intensification
SRI-WAAPP	Improving and Scaling up the System of Rice Intensification in West Africa - Project
ToT	Training of Trainers
UEMOA	West African Economic and Monetary Union
USAID	United States Agency for International Development
USPs	Unidentified Sub-Projects
WAAPP	West Africa Agriculture Productivity Program

PART I PROJECT INFORMATION

1. Project Background and Context

1. West Africa has had an impressive economic growth in the past two decades, with economic growth rates at above 5% between 2000 and 2014 (Africa's Development Dynamics 2018)[1]. Yet it is uneven as Nigeria, Ghana and Côte d'Ivoire represent 85% of regional Gross domestic product (GDP). High informality, increasing inequalities and poverty also undermine growth resilience. Growth in the region is not only driven by the oil and mineral sectors but also by the agricultural sector, which has been the fastest-growing in the world since the 1980s. Agriculture is still the major source of food, income and livelihood for 70–80 percent of the population but it is not currently able to meet the growing food needs of the population. Rapid population growth and increasing urbanization have increased food needs and changed the consumption patterns of the population with a shift towards a higher consumption of imported cereals (wheat and rice). Today, West Africa is the rice basket of Sub-Saharan Africa, producing over two-thirds of its rice. Rice is a staple crop that has been grown in West Africa for more than 3500 years since the domestication of African rice (*Oryza glaberrima*). Produced by low-income smallholders across the entire region, rice plays a key role in regional food security for rural and urban populations. In recent years, increasing demand stemming from population growth and steady increases in annual per capita consumption (combined at 5.93% per year from 2010-2017; with per capita consumption in 2017 as high as 164 kg in Sierra Leone and 150 kg in Guinea) has outpaced production (4.1% per year for the same time period), leading to ever-increasing rice imports from Asia, accounting for 46% of total rice consumption in 2017. This places a heavy burden on government budgets and exposes the region to the volatility of world market prices. This became apparent in 2008, when world market prices tripled in less than four months, resulting in riots (e.g. Liberia, Senegal) over a staple food that the majority of the population could not afford anymore.[2] In response, the Economic Community of West African States (ECOWAS) launched a regional Rice Offensive in 2013 intending to achieve rice self-sufficiency by 2025.
2. The regional Rice Offensive is supported by the National Rice Development Strategies (NRDS), which detail plans to increase rice production on the path to national rice self-sufficiency. It is predicted that between 2017 and 2025 rice consumption in West Africa will continue to increase overall by 32% (from 18.2 million tons to 24.1 million tons of milled rice) based on the population growth in West Africa from 366 million people in 2017 to 450 million in 2025, combined with an estimated increase in per capita consumption from 50 to 54 kilograms during the same time period[3] [4]. This creates a challenge, but the untapped potential to increase rice production is high in West Africa. Yields have remained low at 2.1 t/ha, the availability of under-utilized land is still relatively extensive and climate-resilient rice production techniques are available but not yet widely disseminated and adopted.
3. By using the Climate-Resilient Rice Production (CRRP) approach (see below for more details), the Rice Offensive can address several critical challenges simultaneously: respond to increasing rice consumption needs, strengthen livelihoods of rice farming communities, allow for diversification of economic activities along the rice value chain, improve the overall national economic well-being, free up hard currency – previously used for rice imports - for other national needs, and contribute to political stability. All in all, this will allow adaption to the imminent climate change threats to this key economic sector, and free human, environmental, and financial capital to tackle other pressing adaptation priorities. **West Africa has been identified to be particularly vulnerable to climate change** due to the combination of naturally high levels of climate variability, high reliance on rainfed agriculture, and limited economic and institutional capacity to cope with climate change. [5]

1.1 Bioclimatic zones of West Africa

4. The West African climate is characterized by a strong latitudinal rainfall gradient, separating the region into the humid tropical rainforest zone in the south (Guineo-Congolian region), to humid semi-deciduous forest zone (Guinean region), changing into sub-humid savanna zones (Sudanian Region) and the semi-arid short grass savanna zones (Sahelian region). As climate bands extend from east to west, each country in West Africa (except for The Gambia, Liberia and Sierra Leone) includes two to three climate zones, and even four in Nigeria (Figure 1). [6]
5. Each climate zone crosses several of the 13 countries participating in the RICOWAS project:
   - Sahelian zone crosses 5 countries: Senegal, Mali, Burkina Faso, Niger and Northern Nigeria
   - Sudanian zone crosses 10 countries: The Gambia, Senegal, Mali, Northern Guinea, Côte d'Ivoire, Burkina Faso, Northern Ghana, Togo and Benin and large parts of Nigeria.

[1] https://www.oecd-ilibrary.org/development/africa-s-development-dynamics-2018_9789264302501-en
[2] Styger and Traoré, 2018. 50,000 Farmers in 13 countries; Results from Scaling-up SRI in West Africa. CORAF, Dakar, Senegal.
[3] FAOSTAT Online Database; http://www.fao.org/faostat/en/#home;
[4] Fofana et al, 2014. Impact simulation of ECOWAS rice self-sufficiency policy. IFPRI discussion paper 1405, Washington DC.
[5] Sultan and Gaetani, 2016. Agriculture in West Africa in the 21 Century: Climate Change and Impacts Scenarios, and Potential for Adaptation. Frontiers in Plant Science (7), Article 1262, 1-20.
[6] CILSS, 2016. Landscapes of West Africa. A window on a changing world. Geological Survey EROS, Garretson, SD.

- Guinean zone crosses 6 countries: Guinea, Côte d'Ivoire, Ghana, Togo, Benin, Nigeria
- Guineo-Congolian zone crosses 6 countries: Guinea, Sierra Leone, Liberia, Côte d'Ivoire, Ghana and Nigeria

Figure 1: Bioclimatic regions of West Africa (CILSS, 2016; Landscapes of West Africa)

Bioclimatic regions of West Africa

- The Sahara, or Saharan Region, stretches across the whole northern extent of West Africa formed by the Sahara Desert. It is an arid landscape with average annual rainfall between 0 to 150 mm per year. Vegetation is sparse or absent.
- The Sahel, or Sahelian Region is a broad semiarid belt about 350 km wide. Average annual rainfall is between 150 and 600 mm, with a rainy season ranging from one to five months (June-October). It has a dry season of 8 to 9 months. Vegetation is of herbaceous types (steppe and short grass savanna) often mixed with woody plants.
- The Sudan, or Sudanian Region lies immediately south of the Sahel. Average annual rainfall lies between 600 and 1,200 mm with one rainy season (May-October) and a dry season of 5 to 7 months. The vegetation domain is of the savanna (including open tree savannas, wooded savannas, open woodlands)
- The Guinean Region lies immediately south of the Sudanian Region, with an average annual rainfall between 1,200 and 2,200 mm. It has two rainy seasons (April-July and September – October). 75% of the rain falls between April and July. The vegetation is seasonally wet-and-dry deciduous or semi-deciduous forest.
- The Guineo-Congolian Region is the wettest in West Africa, with average annual rainfall between 2,200 and 5,000 mm. There are two rainy seasons (April – July and September-October) or year-round rainfall with short drier periods between the rains.

1.2 Topography, Geology and Soils

6. The most common soils in the sub-humid zone are Ferralsols and Lixisols but Acrisols, Arenosols and Nitosols also occur. Acrisols are found in southern Guinea, most of Côte d'Ivoire, southern Ghana, Togo, Benin and Nigeria. In the humid zone, Ferralsols and Acrisols are the most frequent while Arenosols, Nitosols and Lixisols are less so. Ferralsols occur widely in Sierra Leone and Liberia. In addition to agroecological zones, the distribution of soils is a function of landscape and other factors such as parent material. The sequence of the main landscape components of inland valleys in West Africa are crests, upper, middle and lower slopes, valley fringes, colluvial foot slopes and, lastly, valley bottoms. The inventory area covered the following countries or parts of them: Benin, Burkina Faso, Côte d'Ivoire, the Gambia, Guinea Bissau, Guinea, Ghana, Liberia, Mali, Nigeria, Senegal, Sierra Leone, and Togo. They reported that soils of the uplands (crests and slopes) are mainly Ferralsols, Acrisols and Lixisols. The latter are the major soils in the northern and central parts of the inventory area (southern Senegal, Gambia, parts of Guinea Bissau, southern Mali, Burkina Faso, northern, central and eastern Ghana, Togo, Benin, and western, central and northern Nigeria). Other soils of the uplands are Nitosols in the coastal terraces and aggradational plains of western Gambia and south-western Senegal, Arenosols, in the northern parts, and Vertisols in Togo, Benin, Mali, Burkina Faso, and Nigeria. Less frequent are Cambisols and Leptosols on strongly eroded valley side slopes. Soils of the Colluvial Footslopes and Valley fringes are Cambisols, Leptosols, Gleysols, Lixisols and Arenosols.

1.3 Hydrology

7. The water resources in West Africa are composed of 28 major transboundary river basins that range in size from 2,113,350 km² (Lake Chad Basin) to 16,000 km² (Tanoé River Basin), which form an important water network covering all countries in the West African region. The most important are the Niger River Basin (including Benin, Burkina Faso,

Guinea, Mali, Niger, Nigeria and Sierra Leone), the Senegal River Basin (including Guinea Mali and Senegal), the Volta River Basin (including Burkina Faso, Benin, Ivory Coast, Ghana, Mali and Togo), the Lake Chad Basin (including Niger and Nigeria), and the Komoé River Basin (including Burkina Faso, Ivory Coast, Ghana and Mali).

1.4 Land Use

8. Agriculture and pastoralism are the most common activities in West Africa. This is reflected in land use where pastoral farming predominantly in terms of covered territory, even if agriculture, particularly in favorable areas (recession areas, inland delta, banks of rivers, wetlands, perimeters arranged for irrigation, etc.) is also practiced by a large section of the population. According to the FAO (2015, 2016), the forest resources of countries in the region will have gone from almost 103 million ha in 1990 to 77 million ha in 2015, an average reduction of 1% per year over the period. Only Ghana has seen an increase in its resources with an average annual rate of 0.3%. This deforestation and degradation of forest resources are fuelled by high population growth and a growing demand for food, agricultural expansion accounts for most land cover change across West Africa (CILSS, 2016).

1.5 Terrestrial Flora and Fauna

9. Due to its geographic scope and its bio-climatological diversity, the area contains a considerably rich ecosystem (forests, savannas, tiger bush, steppes, deserts, etc.), next to its wetlands and marine ecosystem. The various ecosystems, ranging from dry savanna to tropical forest, provide habitats to more than 2,000 amphibians, bird and mammal species (IUCN, 2015). The region's tropical forest, in the Upper Guinean countries, is the main locus for biodiversity. These lowland forests of West Africa are home to 320 mammal species (which represents more than a quarter of Africa's mammals), 9,000 vascular plant species, and 785 bird species (Conservation International, 2008). The Upper Guinean forest is renowned for its primate diversity, with nearly 30 distinct species, and has been identified as some of Africa's most critical primate conservation area[7].

1.6 Rice Agriculture and Food Security in West Africa

10. The estimated total land under cultivation in West Africa has is about 3.7 million ha the greatest rice area which constitutes 56.5 % of the African continent (FAO, 1996). In fact, agriculture in West Africa is the largest source of livelihood and income for the majority of the population in West Africa. Since the 1980s, the growth of the agricultural sector has been the fastest in the world. Animal production experienced a lower growth rate than agriculture due to extreme weather events and overgrazing. Yet, changes and variability in the climate, combined with rapid population growth, lead to severe and ongoing degradation of natural resources, threatening agriculture and livestock production and thus increasing poverty and food and nutrition insecurity.

1.6.1 *Rice systems in West Africa*

11. Rice in West Africa is grown in several ecosystems and a wide range of production systems. Each of the climate zones harbors a diversity of mostly subsistence-based rice systems. In the Guineo-Congolian and Guinean zones, the rainfed lowland and upland rice systems dominate. Mangrove rice systems are developed in the coastal region of Senegal, The Gambia, Guinea, Sierra Leone, Liberia and somewhat in Nigeria. In the Sudanian zone, a mix of upland and lowland rainfed as well as irrigated systems can be found. Irrigation becomes more prevalent moving north into the drier zones of the Sahel. Additionally, rainfed lowland systems are quite common. A few specialty rice systems contribute substantially to local food security and they are well adapted to climate variability. They include deep-water rice and recession rice systems, especially along the Niger River.

Three major rice systems explained

- For the irrigated systems, irrigation water is either added to supplement rainfall (irrigated wet season system) or is essential when rainfall is very low (irrigated dry season systems).
- For upland rice systems, rainfall is the only water source and rice is grown under non-flooded dryland conditions on freely draining aerobic soils. Retaining water in these systems is of ultimate importance.
- The rainfed lowland systems are characterized by non-continuous flooding of rice fields of variable depth and length. The flooding either occurs from rainfall, from surface runoff, or from seasonally rising rivers or other water bodies.

In rainfed rice landscapes, farmers often use more than one rice system simultaneously, situated on different locations along the topo-sequence.

12. In 2017, West African farmers produced rice on 7.3 million hectares. For the 13 RICOWAS countries, upland rice systems occupy 43% of West Africa's rice-growing area but only account for 37% of total production. Rainfed lowland systems cover 40% of the total area and account for 42% of total production.
13. Average yields for these two systems are 1.38 t/ha and 1.65 t/ha respectively. Irrigated production occupies only 11.6% of the rice land area, but accounts for about 17% of total production with average yields of 2.32 t/ha. A fourth category includes some distinctive systems such as mangrove and recession systems. They cover about 5% of the

[7] CILSS (2016). Landscapes of West Africa – A Window on a Changing World.

area and account for 4% of total production.[8] Irrigated and rainfed lowland systems are the most productive, but they are also significant greenhouse gas emitters as a result of flooded fields.

1.6.2 *Rice production and population in West Africa*

14. Rice is grown in all the climate zones of West Africa, and rice production can be found in most and sometimes all of the sub-national regions and districts in each of the 13 countries. It could therefore be stated that the larger project zone for scaling up climate-resilient rice production is the entire region of West Africa. Total production, consumption and imports vary quite significantly for the different countries, as do the per capita consumption – which is higher in the western parts of West Africa – as well as the self-sufficiency rate. In the following table, these parameters and the total population numbers are shown for the year 2016/2017 as well as for the predictions for 2025, representing the ECOWAS goal for reaching self-sufficiency by then.[9]

Table 1: Rice production, consumption, imports, population, yearly per capita consumption, and self-sufficiency rate for 13 ECOWAS countries in 2016/2017 and as estimated for 2025

2016/2017	Production Paddy (t)	Production Milled (t)	Consumed Milled (t)	Imported Milled (t)	Population (million)	Per Capita Cons (kg/y)	% Self Sufficiency
Benin	235,001	151,000	626,000	475,000	11.46	55	24
Burkina Faso	381,000	244,000	619,000	375,000	19.17	32	39
Côte d'Ivoire	2,234,375	1,430,000	2,930,000	1,500,000	23.82	122	49
The Gambia	56,250	36,000	201,000	165,000	2.12	94	18
Ghana	609,375	390,000	1,065,000	675,000	28.66	37	37
Guinea	2,165,625	1,386,000	2,086,000	700,000	13.29	150	66
Liberia	261,538	170,000	430,000	260,000	4.73	91	40
Mali	2,710,938	1,735,000	1,835,000	100,000	18.69	102	95
Niger	117,188	75,000	395,000	320,000	21.56	18	19
Nigeria	4,331,000	2,772,000	4,972,000	2,200,000	191.84	26	56
Senegal	1,062,001	680,000	1,730,000	1,050,000	16.05	108	39
Sierra Leone	1,181,000	756,000	1,106,000	350,000	6.73	164	68
Togo	125,000	80,000	230,000	150,000	7.69	30	35
Total/Average	**15,470,291**	**9,905,000**	**18,225,000**	**8,320,000**	**365.81**	**50**	**54**

2025 estimated	Production Paddy (t)	Production Milled (t)	Consumed Milled (t)	Imported Milled (t)	Population (million)	Per Capita Cons (kg/y)	% Self Sufficiency
Benin	1,166,626	746,641	746,641	0	13.94	54	100
Burkina Faso	1,155,771	739,693	739,693	0	23.90	31	100
Côte d'Ivoire	4,558,034	2,917,142	2,917,142	0	28.72	102	100
The Gambia	518,854	332,067	332,067	0	2.70	123	100
Ghana	1,772,390	1,134,329	1,134,329	0	33.68	34	100
Guinea	3,327,119	2,129,356	2,129,356	0	16.25	131	100
Liberia	1,073,998	687,359	687,359	0	5.73	120	100
Mali	4,249,466	2,719,658	2,719,658	0	23.70	115	100
Niger	926,393	592,892	592,892	0	29.64	20	100
Nigeria	13,226,936	8,465,239	8,465,239	0	233.56	36	100
Senegal	3,059,480	1,958,067	1,958,067	0	20.04	98	100
Sierra Leone	2,111,327	1,351,249	1,351,249	0	7.87	172	100
Togo	438,370	280,557	280,557	0	9.35	30	100
Total/Average	**37,584,763**	**24,054,249**	**24,054,249**	**0**	**449.07**	**54**	**100**

* Data compiled by authors from FAOSTAT database for 2010 (63% milling rate), Index Mundi database for 2016/2017 (64% milling rate) and Fofana et al (2014), estimated for 2025 (64% milling rate)

15. Overall consumption of rice is increasing steadily, based on higher per capita consumption and population increase in the region. In 2019/2020, the total population in the 13 countries in 2019/2020 reached 384 million. With an average population growth rate of 2.7%, the total population is predicted to grow by 65 million people by 2025, reaching 450 million people. Per capita increase of rice consumption from 50 to 54 kg (from 2017 to 2025) is also influenced by the

[8] Diagne et al, 2013. Estimation of cultivated area, number of farming households and yield for major rice-growing environments in Africa. In: Eds Wopereis et al, Realizing Africa's Rice Promise: 35-45.

[9] Styger and Traoré, 2018. 50,000 Farmers in 13 countries; Results from Scaling-up SRI in West Africa. CORAF, Dakar, Senegal.

increase of urbanization in West Africa. In 2019, 44% of the population in the 13 RICOWAS countries lived in urban settings. This trend is likely to increase. [10]

16. More details on these parameters and for each of the 13 RICOWAS countries are shown in Table 2. It shows that Nigeria is holding 52% of the population of all countries with 201 million people. The second most populous countries are Ghana, Côte d'Ivoire and Niger, with 30 million, 26 million and 23 million people respectively. While Nigeria and Ghana have the lowest population growth rate (among the 13 countries) with 2.2 % and 2.5%, Niger exhibits the highest population growth rate in West Africa with 3.8%. Niger also has the highest percentage of rural population with 83%, followed by Burkina Faso with 71%, and Guinea with 64% respectively. All RICOWAS countries are in the lowest global group in regard to GDP per capita. Best performance is exhibited by Côte d'Ivoire, Nigeria and Ghana with about 2200 USD, while eight countries (Guinea, Mali, Burkina Faso, The Gambia, Togo, Liberia, Niger and Sierra Leone) have a per capita GDP of less than 1000 USC (see Table 2).

Table *2: Demographic characteristics of the 13 RICOWAS countries*

RICOWAS countries	Total population 2019/2020 in Million	Population growth rate 2019 %	Rural population 2019 %	Urban population 2019 %	Fertility rate, births per woman, 2019 Number	Death rate / 1000 lives, 2019 Number	GDP per capita, 2019 US$
Benin	11.8	2.7	52	47	4.8	8.8	1219
Burkina Faso	20.32	2.8	71	29	5.2	8.1	787
Côte d'Ivoire	25.72	2.5	49	51	4.7	9.7	2276
The Gambia	2.35	2.9	39	61	5.2	7.0	778
Ghana	30.42	2.2	43	57	3.9	6.6	2202
Guinea	12.77	2.8	64	37	4.7	8.4	963
Liberia	4.94	2.4	48	52	4.3	7.5	622
Mali	19.66	3	57	43	5.9	9.6	879
Niger	23.31	3.8	83	17	6.9	8.1	554
Nigeria	201	2.6	49	51	5.4	11.8	2230
Senegal	16.3	2.7	52	48	4.6	5.7	1447
Sierra Leone	7.81	2.1	58	42	4.3	11.0	527
Togo	8.08	2.4	58	42	4.3	8.4	679
Total/Average	384.48	2.7	55.6	44.3	4.9	8.5	1166

(World Bank Open Data, 2021)

1.7 Climate change vulnerabilities, impacts and risks

17. West Africa[11] has been identified to be particularly vulnerable to climate change due to the combination of a highly variable climate – which is among the most variable in the world on intra-seasonal to inter-decadal timescales - the high reliance on rainfed agriculture, and the limited economic and institutional capacity to cope with climate change.

18. A graphic presentation of observed trends and forecasts under different climate change scenarios for annual temperature change and annual precipitation change for Africa is shown in Figure 2. Over the past 50 years, annual average temperatures increased significantly, from +0.5 to +0.8 °C between 1970 and 2010 over West Africa, with an increase in the number of warm days and warm nights and a decrease in the number of cold days and nights. Warming was slightly higher than the global average in the Sahel, warming was even more pronounced between +1.5-2.0°C between 1950 and 2010, with greater warming in April, May and June. The interpretation of precipitation observations is more complex than those in temperature, exhibiting higher seasonal and spatial variations. The 5th IPCC assessment report points out that the lack of sufficient observational long-term data series does not allow for clear conclusions to be drawn about trends in annual precipitation over the past century for West Africa. What could be observed was a growing climate divide between the eastern and western parts of the Sahel, with less rainfall in the west and higher rainfall in the east. During the last two decades, precipitation experienced higher interannual variability over the region with delayed onsets and early retreats of the rainy seasons. Additionally, an increased frequency of heavy rainfall events was observed. Sea levels have also been rising by +8.4 cm from 1942 to 2012 in Dakar (Senegal), and to a greater extent of about 25 cm since the 1930s in Takoradi, Ghana.

[10] The World Bank (online). World Bank Open Data, accessed on March 25, 2021 (https://data.worldbank.org/)

[11] Riede et al, 2016. What's on the 5th IPCC Report for West Africa? In: Eds Yaro and Hesselberg, Adaptation to Climate change and variability in rural West Africa. Springer International Publishing, Switzerland. 7-24.

- Sylla et al, 2016. Climate change over West Africa: recent trends and future projections. In: Eds Yaro and Hesselberg, Adaptation to Climate change and variability in rural West Africa. Springer International Publishing, Switzerland. 25-40.

- USAID, 2018. Climate Risk Profiles, fact sheets for different West African countries.

- IPCC, 2014. The IPCC's Fifth Assessment Report, Cambridge UK and New York, USA.

- Sultan and Gaetani, 2016. Agriculture in West Africa in the 21 Century: Climate Change and Impacts Scenarios, and Potential for Adaptation. Frontiers in Plant Science (7), Article 1262, 1-20.

19. **Climate change forecasts** - Africa's exposition and huge landmass make it more likely that temperatures will rise faster than the global average during the 21st Century. Projections indicate that temperatures in West Africa will rise between +1.5°C to 3°C by 2050, and between 3°C and 6°C by the end of the 21st century, with the greatest warming in the Sahel. There is also a highly likely increase in the frequency of hot days, as well as long-lasting heat waves (of +6 to 28 days) with a higher increase in the eastern part of West Africa by 2050.

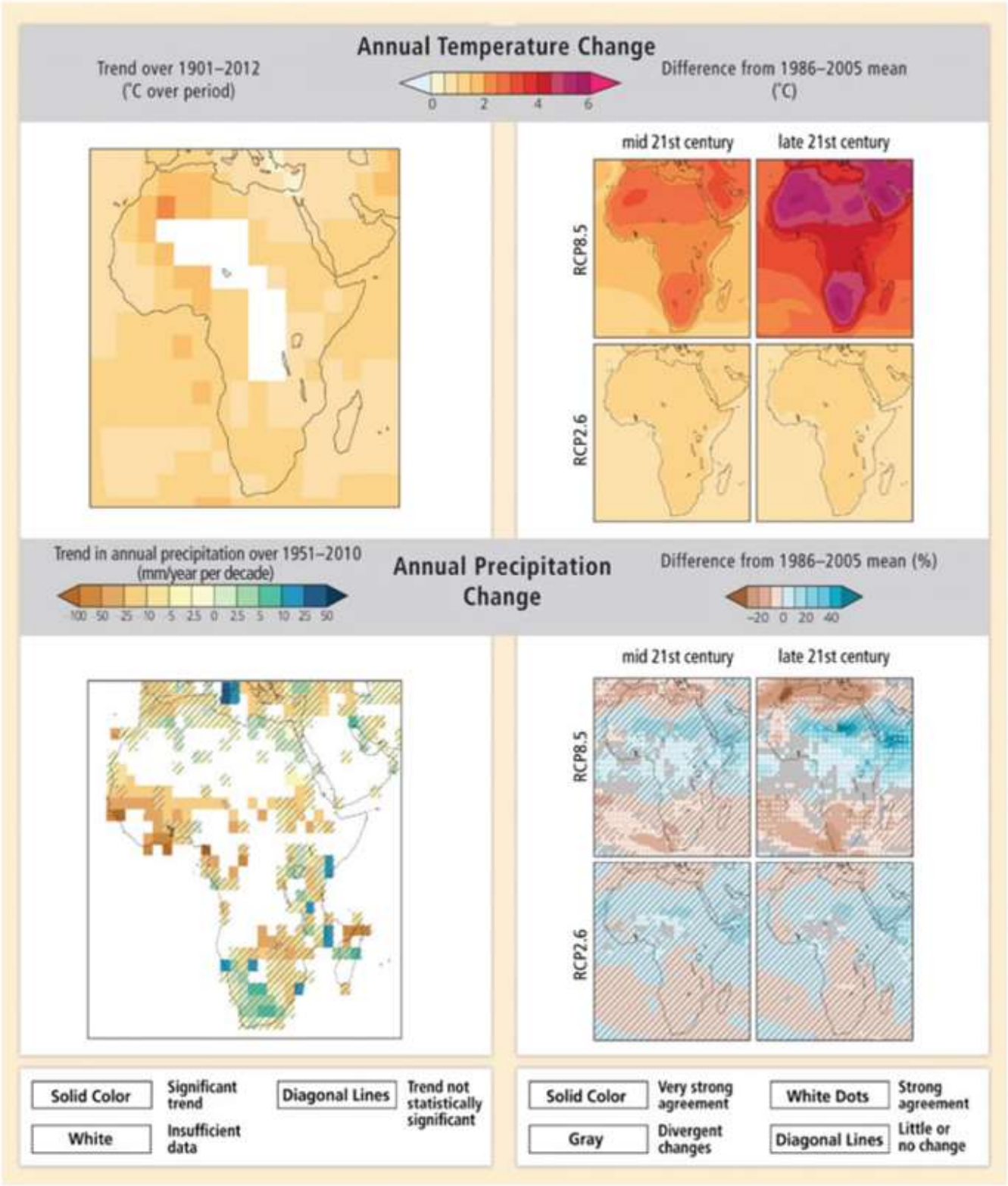

Figure 2: Riede et al, 2016: Modified graphic from the IPCC chapter AR5 WG2 Chapter 22 (2014), show observed and projected changes in annual average temperature and precipitation

20. The patterns in precipitation change are less clear, and predictions are not consistent and at times contradicting across the different climate models. IPCC noted that precipitation uncertainty ranges as wide as – 30% to +30% for the West African region, but with most models suggesting decreasing rainfall for the Western Sahel. (USAID, 2018)
21. More specifically: For the Western Sahel: Most models show decreased rainfall with a range of -16 to +6 percent (Senegal, The Gambia). Remainder of the region: Most models show increased rainfall with a range of 0 to +38 percent (Niger), -1 to +12 percent (Nigeria), -2 to +7 percent (Côte d'Ivoire, Ghana, Togo, Benin), and -3 to +11 percent (Burkina Faso, Mali). Heavy rainfall is predicted to intensify and become more frequent by 2050.
22. More specifically: Increased frequency (+1 to 43 percent) and intensity (+1 to 12 percent) of heavy rainfall events in much of the region (i.e., Nigeria, Ghana, Benin, Togo, Côte d'Ivoire, Burkina Faso, Mali); Increased frequency (+16 to 75 percent) and uncertain trends for intensity (-4 to +21 percent in Niger; Uncertain trends in the frequency of (-10 to +31 percent) and intensity (-2 to +14 percent) in Senegal and The Gambia.
23. The forecasts seem to agree better for the last three decades of the 21st century. They show significant decreases in mean precipitation, and most countries in West Africa will have to cope with longer dry spells, an increase in frequency and intensity of extreme precipitation, and shorter rainy season and growing seasons. Sea levels along the coast of West Africa will continue to rise between 13cm and 56cm over the course of the century.

1.7.1 *Impact of climate change[12] on the region and agriculture*

24. The impacts of climate change on the region are expected to be widespread, complex, and geographically and temporally variable.
25. Regional impacts of climate change are expected to be felt in new ways and to expand. While much of the climate impact on agriculture may be local, impacts can extend beyond national borders. Decreased and more variable crop and livestock production and changes in livestock movements and fish stocks can have transnational implications for food availability and quality in addition to exacerbating conflict over land and water resources. Weather-induced disruption of transportation networks in one area can also constrain access to agricultural inputs and markets across borders. Impacts might be also felt with an increase in cost for food, health care and basic infrastructural provisions. Climate risks to agriculture combined with rapid population growth may threaten the food security and economies of individual countries.
26. Impact on agriculture: Weather-related crop and livestock losses that already cause economic losses and undermine food security in the region are expected to increase. Rising temperatures and evaporation rates are likely to increase water stress, particularly during the dry season. Increased rainfall is projected in some areas, although temperature and evaporation trends may counter the rainfall effect such that by the 2050s, water availability in the dry season is decreased compared to the present climate. Changes in rainfall distribution and intensity will potentially disrupt the growing season calendars and crop production due to increased dry spells, droughts, and heatwaves as well as the greater likelihood of floods, which will damage agricultural production.

1.7.2 *Impact of climate change on rice production in West Africa*

27. As rice production is practiced across the entire region in all climate zones and is dominantly rainfed, key risks from the increasing variability of climate events will result in the disruption of the growing season calendars, shortening of the cropping season, and exacerbated dry spells, droughts, and heatwaves. It will also create greater likelihoods of floods, shortage of irrigation water, strong winds and storms, and changes in incidences and geographic range of pests and diseases, - all of which can lead to substantial rice yield reductions or crop failure. More specific predictions on the impact of climate change on rice production have been researched by Zwart (2016), who modelled the change in rainfall and temperatures for the rice-growing seasons and rice-growing areas in Africa based on different climate change scenarios. Figures (3 and 4) show the change in rainfall and maximum temperatures for the rice main season for RCP2.6 and RCP8.5, showing the current date, 2030, 2050 and 2070 scenarios.

[12] Riede et al, 2016. What's on the 5th IPCC Report for West Africa? In: Eds Yaro and Hesselberg, Adaptation to Climate change and variability in rural West Africa. Springer International Publishing, Switzerland. 7-24.

- Sylla et al, 2016. Climate change over West Africa: recent trends and future projections. In: Eds Yaro and Hesselberg, Adaptation to Climate change and variability in rural West Africa. Springer International Publishing, Switzerland. 25-40.

- USAID, 2018. Climate Risk Profiles, fact sheets for different West African countries.

- IPCC, 2014. The IPCC's Fifth Assessment Report, Cambridge UK and New York, USA.

- Sultan and Gaetani, 2016. Agriculture in West Africa in the 21 Century: Climate Change and Impacts Scenarios, and Potential for Adaptation. Frontiers in Plant Science (7), Article 1262, 1-20.

-Jalloh et al, 2012. West African Agriculture and Climate Change, IFPRI, Washington DC

-Van Ort and Zwart, 2018. Impacts of climate change on rice production in African causes of simulated yield changes. Glob. Change Biol. 24: 1029-1045.

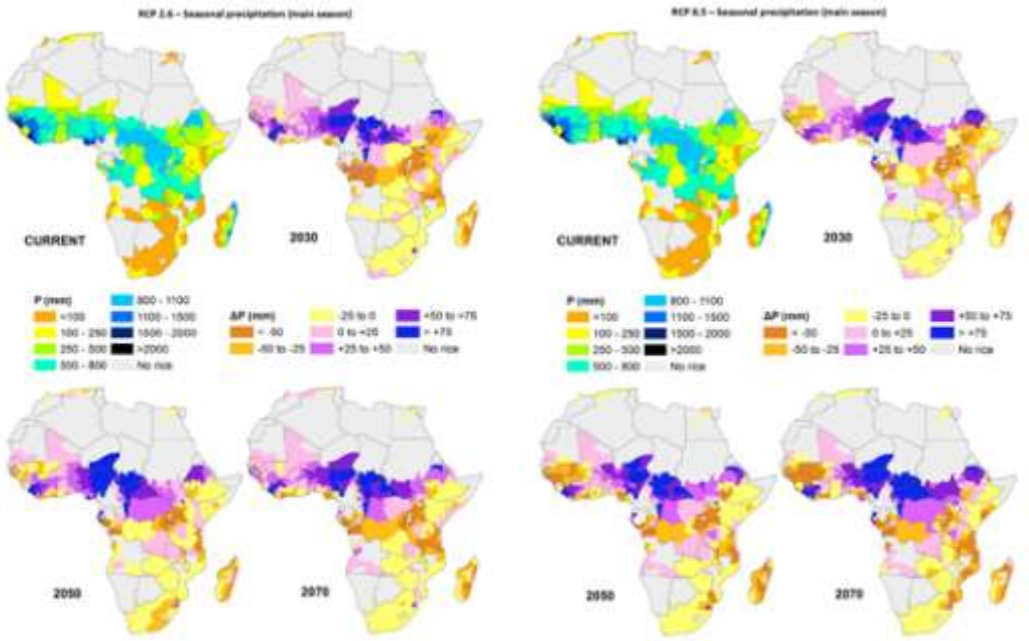

Figure 3: Predicted change of seasonal precipitation for the rice main growing season at current situation, 2030, 2050, and 2070, and for the models RCP2.6 (left) and RCP8.5 (right) (Zwart, 2016)

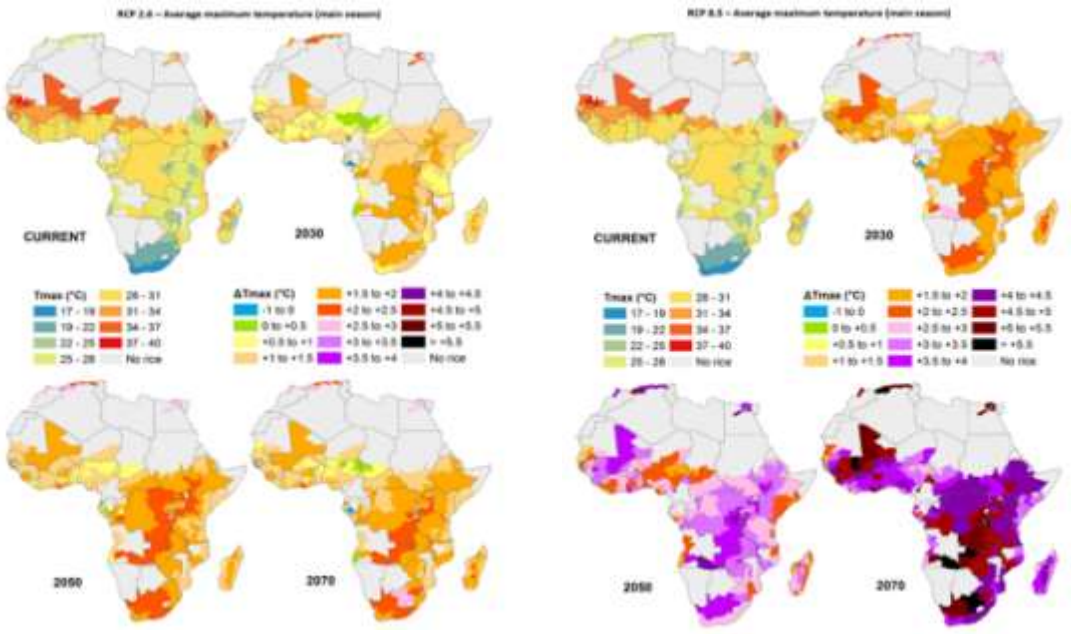

Figure 4: Predicted change of maximum temperatures for the rice main growing season at current situation, 2030, 2050, and 2070, and for the models RCP2.6 (left) and RCP8.5 (right) (Zwart, 2016)

These research findings can be summarized as follows[13]:

28. **Predictions for change in precipitation**: In the main rice cropping season, reduction in rainfall will occur in the western part of the Sahel, with Mali, Senegal, northern Guinea being most affected, but also along the coast most importantly for Ghana, Togo, Benin, as well as Côte d'Ivoire. Rainfall increases are predicted in Liberia, the northern and eastern part of Nigeria, the southern part of Niger, and to a certain extent northern part of Côte d'Ivoire, Benin, and Togo, and eastern Burkina Faso. In the off-season, the predicted differences are lower and less relevant, due to low rainfall levels during the off-season in most countries.
29. **Predictions for change in average maximum temperatures:** In the main season, the highest increase in maximum average temperatures can be expected for the western part of the Sahel, including Mali, the northern part of Burkina Faso and Senegal. This will become a major problem, as the current average maximum temperatures in these areas are already high. Moving eastwards, temperature increases are a bit more moderate, with Northern Nigeria being least affected. In the off-season, the irrigated rice in the zone is grown under extremely high temperatures between 34-40 ^{o}C on average. Climate change scenarios predict that another 2^{o}C (RCP2.5) to 4-5 ^{o}C (RCP8.5) may be added.

[13] Zwart, S.J., 2016. Projected climate conditions for rice production systems in Africa. AfricaRice GIS Report – 1. Africa Rice Center, Cotonou, Benin

30. **Predictions for change in average minimum temperatures:** In the main season, the predicted increases in minimum temperatures show less variation than for maximum temperatures. Increases in average minimum temperatures for the 2070s vary from 0.5-2.5°C under RCP2.5 to 3-5.5 °C under RCP8.5. Increases in the Sahel zones are about 1°C more than for other countries. In the off-season, average minimum temperatures show similar increases as in the main season and the entire Sahel zone from Mali to Chad shows increases of more than 5°C under scenario 8.5.

31. **Conclusions:** A major limitation to these models refers to the fact that the climate change scenario outputs are averages over 10 years. Extremes will most likely be higher during individual years and seasons. Moreover, the outputs are monthly values. Although if total seasonal rainfall might show fairly limited changes, it is known that rainfall events are becoming more erratic and of higher intensity due to the effects of climate change.

1.7.3 *Impact of Climate change on rice yields in West Africa*

32. Van Oort and Zwart (2017) have simulated yield changes for rice production for the different RCP scenarios, for irrigated and rainfed rice and for the main off-season. They also differentiated between changes without/with measures of adaptation. To be noted here, the adaptation measures here include only the adoption of heat-tolerant rice varieties, but no agronomic adaptation measures have been considered. Both scenarios thus represent a baseline in relation to additional benefits that will be created with SRI and CRR, with a lot of potential for improving these scenarios which can be expected with the approach the RICOWAS project is developing and scaling up. The yield reduction should be significantly reduced by CRRP implementation, even to the contrary yields which should be increased despite climate change. The RICOWAS project will provide highly important data that can illustrate a sustainable path to climate change adaptation.

Table 3: Simulated rice yield changes between 2000 to 2070 for RCP 2.6 for 11 West African countries

	Rice yield changes 2000 to 2070. RCP 2.6							
	Without adaptation				With adaptation			
	Irrigated		Rainfed		Irrigated		Rainfed	
Country	Main season (wet)	Off season (dry)	Low-land	Upland	Main season (wet)	Off season (dry)	Low-land	Upland
Benin	-0.03	-0.18	-0.01	-0.02	0.06	-0.08	0.07	0.08
Burkina Faso	0.01	-0.07	-0.01	0.03	0.08	0.00	0.07	0.14
Cote D'Ivoire	-0.02		-0.04	-0.08	0.06		0.04	0.03
Cameroon	0.01	-0.17			0.07	-0.04		
Ghana	-0.06	-0.06	-0.05	-0.09	0.05	0.00	0.05	0.07
Gambia	-0.08	-0.08	0.12	0.25	0.04	0.02	0.04	0.08
Mali	-0.09	-0.27	0.03	0.02	0.01	-0.18	0.03	0.02
Mauritania	-0.03	-0.08			0.06	0.00		
Niger	-0.07	-0.13			0.02	-0.14		
Nigeria	-0.06	-0.10	-0.09	-0.09	0.07	0.00	0.05	0.02
Senegal	-0.04	-0.04			0.04	0.02		
Total	-0.05	-0.11	-0.04	-0.06	0.05	-0.04	0.05	0.04

(Van Oort and Zwart, 2017)

Table 4: Simulated rice yield changes between 2000 to 2070 for RCP 8.5 for 11 West African countries

	Rice yield changes 2000 to 2070. RCP 8.5							
	Without adaptation				With adaptation			
	Irrigated		Rainfed		Irrigated		Rainfed	
Country	Main season (wet)	Off season (dry)	Low-land	Upland	Main season (wet)	Off season (dry)	Low-land	Upland
Benin	-0.13	-0.59	-0.21	-0.25	0.13	-0.41	0.13	0.11
Burkina Faso	-0.23	-0.49	-0.31	-0.28	0.07	-0.33	0.07	0.12
Cote D'Ivoire	-0.13		-0.13	-0.28	0.17		0.11	0.08
Cameroon	-0.04	-0.52			0.14	-0.31		
Ghana	-0.20	-0.36	-0.18	-0.37	0.13	-0.16	0.11	0.07
Gambia	-0.25	-0.30	0.29	0.85	0.06	-0.05	0.18	0.26
Mali	-0.33	-0.80	-0.09	-0.17	-0.07	-0.70	0.04	0.00
Mauritania	0.07	-0.14			0.21	0.02		
Niger	-0.29	-0.45			-0.10	-0.48		
Nigeria	-0.30	-0.42	-0.25	-0.27	0.06	-0.18	0.11	0.04
Senegal	0.04	-0.10			0.18	0.06		
Total	-0.20	-0.43	-0.18	-0.25	0.07	-0.27	0.10	0.07

(Van Oort and Zwart, 2017)

33. In conclusion: Without adaptation measures, estimated reductions in rice yield across West Africa range from 5-25% and up to 80% depending on the location and rice system employed. The largest decreases of 40% to 80% are predicted for the irrigated rice systems in the Sahel zone in the hot-dry season, which is attributed to reduced plant photosynthesis at extremely high temperatures. In the same area in the rainy season (slightly cooler) within the same area, irrigated rice yields were predicted to decrease by around 40%.[14] In the Sudanian and Guinean climate zone, where rainfed systems dominate, rice yields will especially be affected. In the coastal areas, rice will be highly sensitive to the combination of increased temperature, humidity and rainfall intensity. It will become more vulnerable to pests and diseases that thrive in warmer, wetter conditions, such as the rice gall midge, rice weevil, and bacterial leaf blight. In low-lying coastal areas, a relatively small rise in sea level can result in rice land inundation, followed by salinization of the land and the freshwater.[15]

34. The widespread and common rice production practices in West Africa are either traditional, marked by low yields, or those that depend on agrochemical inputs, which are often neither affordable for smallholders nor environmentally sustainable. Both systems are highly susceptible to climate change. With farmers trying to cope, it can be expected that pressure on natural resources will increase, be it on vegetation, soils or water, leading to overuse, degradation, potential conflicts, rural exodus and international emigration. To mitigate these effects, introducing adaptation measures and strengthening resilience is a necessity.

1.8 Adaptation measures and project approach

35. To manage the inevitable impacts of climate change, adaptation is needed. The IPCC emphasizes that adaptation and development approaches can go together and reinforce each other. Adopt climate-smart agriculture can address many of the constraints and needs cited above. This approach strives for a triple-win. It not only targets adaptation but also the increase in crop productivity and the mitigation of greenhouse gases. In rice production, a highly efficient method that has been successfully introduced to the different climate and agro-ecological zones of West Africa is called the System of Rice Intensification (SRI).

36. The System of Rice Intensification is an agro-ecological and low-input methodology to increase rice productivity. It allows yields to increase by 20-50% and more while using 90% less seed, 30-50% less water and 30-100% fewer agro-chemicals. Based on the principles of early plant establishment, reduced competition among plants, enriching soils with organic matter, and reduced water use, rice plants grow more vigorously and can better express their genetic potential than under conventional approaches. Healthier and stronger plants with deeper roots can better withstand weather calamities such as drought, floods, and strong winds, and assure (some) production, while conventionally planted crops succumb more easily to these forces, often leaving farmers without harvests[16].

37. SRI is a knowledge-based methodology and allows farmers to improve rice production and the fertility of the soils with the resources available on their farms. As an agronomic approach, any variety improves its productivity when planted with SRI, be it a high-yielding or a traditional variety. Once farmers have learned the technique, they can improve their farming outputs within one cropping season. This makes SRI a very effective method, especially for the more vulnerable groups of the population. Hence, demand from the rice farmers across the region to obtain proper training and adapting the method to their specific farming environments has been increasing steadily over the last few years.

38. SRI trials in West Africa began in 2000. These confirmed the cited advantages but remained known only at the local level, and it was only after 2010 based on successful experiences in Mali that the SRI method became better known in the region. With interest in SRI increasing across the region, a regional project “Improving and Scaling up the System of Rice Intensification in West Africa” (SRI-WAAPP) was commissioned and supervised by CORAF/WECARD, as part of the West Africa Agriculture Productivity Program (WAAPP), supported by the World Bank under the institutional umbrella of ECOWAS (Styger and Traoré, 2018). The SRI-WAAPP project ran from January 2014 to June 2016 in 13 ECOWAS countries: Benin, Burkina Faso, Côte d’Ivoire, The Gambia, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo. In only two years, the project directly benefited more than 50,000 farmers, of whom 34% were women. Yields for rainfed lowland and irrigated rice increased by more than 50%. However, the project reached only 1.1% of the estimated 4.5 million rice farmers in West Africa.[17]

39. This project to the Adaptation Fund is conceived not only in response to the strong demand from rice farmers across West Africa to scale up SRI, but will also include the more medium-term and underlying remedies for developing sustainable and resilient rice systems that can better withstand adverse effects of climate change.

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14 - Van Ort and Zwart, 2018. Impacts of climate change on rice production in African causes of simulated yield changes. Glob. Change Biol. 24: 1029-1045.

15 IPCC, 2014. The IPCC’s Fifth Assessment Report, Cambridge UK and New York, USA
- Jalloh et al, 2012. West African Agriculture and Climate Change, IFPRI, Washington DC
- Riede et al, 2016. What’s on the 5th IPCC Report for West Africa? In: Eds Yaro and Hesselberg, Adaptation to Climate change and variability in rural West Africa. Springer International Publishing, Switzerland. 7-24.
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- Sylla et al, 2016. Climate change over West Africa: recent trends and future projections. In: Eds Yaro and Hesselberg, Adaptation to Climate change and variability in rural West Africa. Springer International Publishing, Switzerland. 25-40.
- USAID, 2018. Climate Risk Profiles, fact sheets for different West African countries.
- Van Ort and Zwart, 2018. Impacts of climate change on rice production in African causes of simulated yield changes. Glob. Change Biol. 24: 1029-1045.

16 Styger and Uphoff, 2016. The System of Rice Intensification (SRI): Revisiting Agronomy for a Changing Climate. Climate-Smart Agriculture Practice Brief. CCAFS, Copenhagen, Denmark.

17 Styger and Traoré, 2018. 50,000 Farmers in 13 countries; Results from Scaling-up SRI in West Africa. CORAF, Dakar, Senegal.

40. The Climate-Resilient Rice Production (CRRP) approach used in this project is based on the SRI methodology in combination with location-specific Sustainable Land and Water Management (SLWM) practices, and if indicated with Integrated Pest (and disease) Management (IPM).

41. The foundation for climate-resilient rice systems lies in Integrated Soil and Water Management (ISWM), keeping soils structurally intact and improving them with organic matter, both keys to developing healthy soils. Storing water within a plot or the landscape and being able to add or remove water from rice fields as needed are key to developing improved water management approaches. The technical methods used will vary depending on the constraints and opportunities, and on the different climate zones and rice production systems. To be able to respond efficiently to the different conditions, the project will use a modular approach for capacity strengthening and field implementation.

42. The RICOWAS project does not start from zero but will build directly on the strong institutional buy-in and human capacity in each of the 13 countries developed during SRI-WAAPP. The SRI-WAAPP project monitored 1088 SRI sites across the region, which are shown in Figure 5. The RICOWAS project preparation has taken the SRI-WAAPP results into account and is designed to build on these achievements. The RICOWAS project will focus on scaling up CRRP as an adaptation measure to different and location-specific climate threats. It will also contribute directly to the objectives of the Rice Offensive as specified in the Regional Agricultural Policy for West Africa (ECOWAP) of the Economic Community of West African States (ECOWAS).[18]

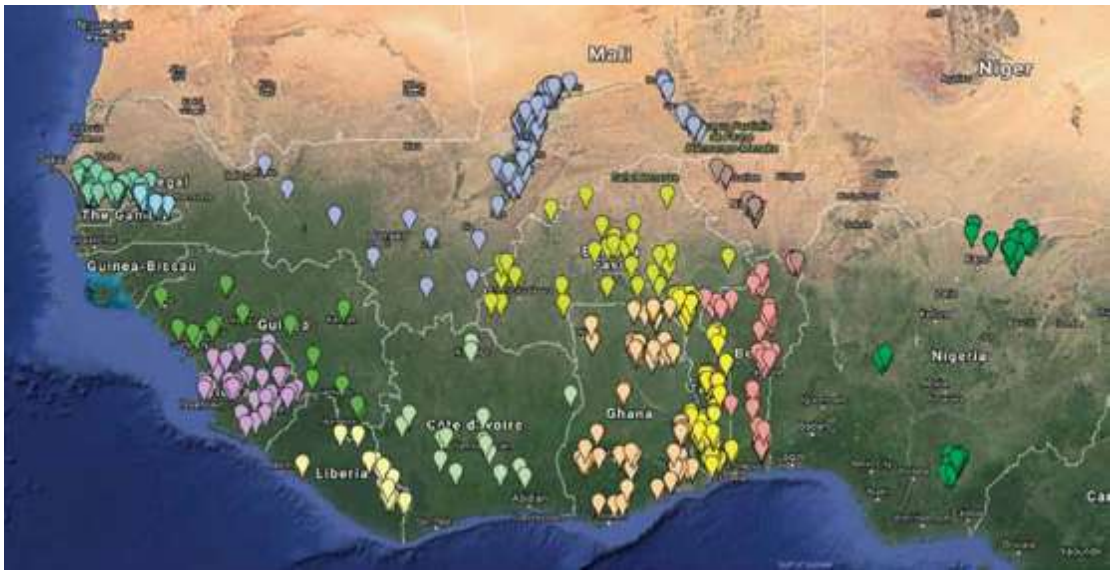

Figure 5: 1088 SRI-WAAP sites in 13 West African countries, June 2016 (not including SRI sites of partner organizations)

1.9 The RICOWAS project zone identification and description

43. The consultation process to identify and validate the project zones was extensive (See Part II. Section I.). Initial zones were proposed by the National Executing Entities. The primary criteria included: i) national priorities for improving rice production, ii) threats and vulnerabilities posed by climate change to rice production and rice producers, and iii) potential improvements to rice production and adaptation strategies. Project zone selection was discussed and reviewed during the pre-concept note and the concept note stage through stakeholder consultation. This process was intensified during the project proposal stage by i) consulting with the local stakeholders in the project zones (through local meetings and a stakeholder survey), and ii) reassessing and validating the project zones during national workshops, which took place in each of the 13 countries during late March and early April 2021. Project zones were identified at the second administrative (district) level at the concept note stage. The zones were more narrowly identified at the third administrative (commune) level during the project proposal stage, and even down to the level of the rice production sites in some countries. The regional map of the project zones at the commune level is shown in Figure 6.

18 ECOWAS (2008). Regional Agricultural Policy for West Africa: ECOWAP: Make agriculture a lever of regional integration, ECOWAS, published in France.

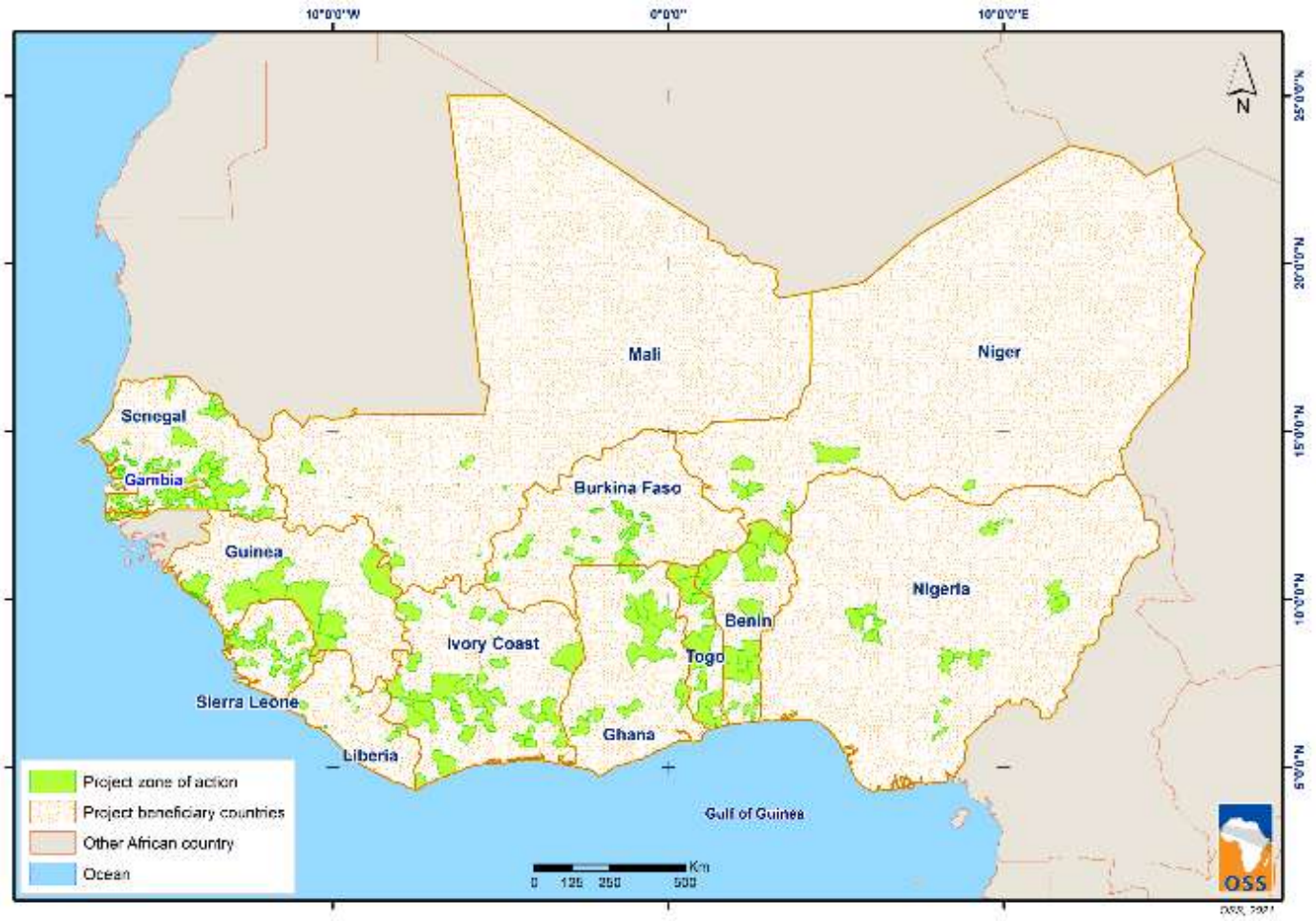

Figure 6: Regional map of the project zones and communes

44. The RICOWAS project zone covers 396 communes in 173 districts in 89 regions across 13 countries. The total population in the project zone adds up to more than 35.7 million people, 7.4% of the total population of all 13 countries. The primary direct beneficiaries in the RICOWAS project zones are a projected 153,138 rice growers implementing CRRP on an estimated 71,240 ha over the course of the project. 37% of these farmers will be women. The percentage of women beneficiaries varies somewhat across the 13 countries, as in some countries rice is planted principally by men (e.g., Niger, Sierra Leone), in others primarily by women (The Gambia), and others by both men and women (e.g., Benin, Togo). Gender attribution in rice production can also vary significantly within a given country: e.g., in Mali, rice is mainly grown by women as a food crop in the lowland systems of the south, whereas further north, it is mainly men who plant irrigated rice as a cash crop. These local distinctions have been taken into account throughout the project design as indicated in the gender assessment study (Annex 3), which was conducted during the proposal preparation. The number of beneficiaries and the area under CRRP varies among the 13 countries due to significant differences in i) the degree of scaling-up efforts for SRI [19] ii) the level of decentralized capacity for undertaking SRI, and iii) the difficulty of access to sites and the associated costs of access. Countries differ also by their scaling-up strategies through the number of communes covered (Senegal 102, Ghana 54, Sierra Leone-Liberia-Côte d'Ivoire between 38 and 32, Niger 9, Guinea 6 etc.) and the targeted rice farmers (more than 13, 000 in Mali, Sierra Leone, Senegal, Ghana and Nigeria, 3 392 in Côte d'Ivoire etc.). For the countries with a high number of communes and targeted rice farmers, RICOWAS will mainly reinforce existing assets and ongoing efforts (equipment/tools, training, assistance to the rice value chain stakeholders etc.).

45. The selection of the beneficiaries presented in table 5 (summary of the results from beneficiaries' analysis) through the stakeholder consultation with the rice-producing communities during the project proposal preparation, a specific questionnaire was used to identify the vulnerable and marginalized groups as well as volunteer beneficiaries within these groups. This process will continue and will further bring details at the beginning of the project according to the following guidelines: At the start of the project, the already identified beneficiaries will be confirmed according to criteria adopted by the NEEs in each country. The guidelines will be provided by the OSS as the IE for the project and will ensure compliance with the AF requirements. Common principles for beneficiary selection have been identified at the regional level: The NEE in the 13 countries have unanimously recognized that women and youth are the most vulnerable groups in the project intervention zones. It was also maintained that the final selection of beneficiaries will be done in a participatory, consensual, transparent, and trackable way by a committee composed of community representatives and members of the implementing technical services. The selection of beneficiaries will be guided by

19 Styger and Traoré, 2018. 50,000 Farmers in 13 countries; Results from Scaling-up SRI in West Africa. CORAF, Dakar, Senegal.

the following criteria: making sure that at least 30% of beneficiaries will be women or youth (following also the official ECOWAS guidelines), previous experience with SRI and SLWM methods, level of commitment to practice CRRP, accessibility of the rice plot, and availability and commitment to continue with project activities and CRRP beyond the project's timeline.

Table 5: RICOWAS project zone characteristics for 13 countries

Country	Regions	Districts	Communes	Total population	Total Direct Beneficiaries (= Rice Producers)	Men	Women	Women	Total Rice area
	Numbers	Numbers	Numbers	Numbers	Numbers	Numbers	Numbers	%	ha
Benin	4	9	23	2,432,899	7,128	3,299	3,829	54	7,061
Burkina Faso	6	17	22	7,748,307	6,830	3,923	2,907	43	2,142
Côte d'Ivoire	25	32	32	1,050,242	3,392	2,869	523	15	3,199
The Gambia	4	6	18	252,501	8,485	1,575	6,910	81	2,122
Ghana	7	16	54	12,800,659	13,173	10,246	2,927	22	10,176
Guinea	4	6	6	540,215	5,600	4,050	1,550	28	2,200
Liberia	6	14	35	1,379,688	13,620	4,602	9,018	66	2,741
Mali	4	10	11	521,016	18,164	15,439	2,725	15	9,403
Niger	4	8	9	571,405	10,981	10,519	462	4	3,241
Nigeria	5	5	15	2,458,044	30,000	20,000	10,000	33	15,000
Senegal	11	23	102	2,073,541	14,245	6,094	8,151	57	6,213
Sierra Leone	4	10	38	1,674,078	15,000	13,585	1,415	9	3,000
Togo	5	17	31	2,234,710	6,513	3,116	3,397	52	4,742
Total	89	173	396	35,737,305	153,131	99,317	53,814	37	71,240

46. All major rice systems will be included in the RICOWAS project zones, selected according to the criteria indicated above. The rainfed lowland system, covering 39% of the total rice area assisted by the RICOWAS project, will be included in all 13 countries. The irrigated system (48% of total area) will be included in 10 countries, and CRRP in plains and uplands (12% of the area) will be integrated into three countries. Finally, it is only in Guinea that the project will work in the mangrove system (1% of the total area). Details are shown in Table 6.

Table 6: Rice systems and predicted associated area (ha) under CRRP of the RICOWAS project

	Rainfed Lowland System	Irrigated System	Plain / Upland System	Mangrove System	All Systems
	ha	ha	ha	ha	ha
Benin	305		6,756		7,061
Burkina Faso	341	1,801			2,142
Côte d'Ivoire	1,175	2,024			3,199
The Gambia	57	2,065			2,122
Ghana	5,336	4,840			10,176
Guinea	1,000		900	300	2,200
Liberia	1,251	1,490			2,741
Mali	1,715	7,688			9,403
Niger	2,036	1,205			3,241
Nigeria	4,800	10,200			15,000
Senegal	4,525	1,688			6,213
Sierra Leone	2,025		975		3,000
Togo	3,283	1,459			4,742
Total	27,849	34,460	8,631	300	71,240
% system area/all systems	39	48	12	1	100
Number of countries using system	13	10	3	1	13

1.10 Vulnerability assessment and adaptation measures

47. In addition to national priorities, both vulnerability of the rice sector to climate change and opportunities for improving rice production through adaptation measures were the main criteria for choosing the project zones. This selection process comprised multiple stages and utilized different instruments as detailed below. National facilitators in each country undertook a vulnerability assessment concerning threats of climate change to each of their national rice sectors. They also considered other (non-climate change) associated constraints and risks. This assessment was initiated during the pre-concept note stage, extended for the concept note stage, and deepened during the proposal development stage. During proposal development, facilitators consulted directly with rice farming communities in the project zones, both through community meetings (although restricted due to COVID-19), and by carrying out a survey sampling a total of 728 respondents from the project zones in all 13 countries.

48. Table 7 details the leading issues identified in each country. Although only top-ranked priorities are listed, this does not mean that other constraints and issues are not present as well. Rice producers in all countries already experience

erratic rainfall, drought events and floods, all of which lead to yield decline by causing damage to plants and plots, and by disrupting the planting calendars. The most pressing constraint evoked was the lack of equipment for soil preparation, sowing or transplanting, weeding, and harvesting, which leads to low labor productivity. Labor may be too costly, insufficient for the land area to be cultivated, or simply not available, and thus impacts the already low profitability of rice production. Widespread soil degradation leads to low yields and increased pressure from weeds, pests, and diseases. Finally, poor water management may exacerbate existing water shortages, or over-water the crop (where sufficient water is available); both cases result in low crop performance.

Table 7: Priority concerns and vulnerabilities for the rice sector in the 13 countries (survey responses)

Contraints/vulnerabilities	Ben	BF	CDI	Gam	Gha	Gui	Lib	Mal	Nig	Nga	Sen	SL	Tog	sum	% resp
Climate change threats															
Erratic rainfall, dry spells and drought	■	■	■	■	■	■	■	■	■	■	■	■	■	13	73
Floods	■	■	■	■	■	■	■	■	■	■	■	■	■	13	54
Impact on rice crop															
Reduced yields	■	■	■	■	■	■	■	■	■	■	■	■	■	13	78
Damage to plants and plots	■	■				■	■	■	■	■	■	■	■	10	51
Loss in rice quality	■	■				■	■	■		■	■		■	8	44
Non-respect crop calendar	■			■		■	■				■	■	■	7	30
Pest and disease increase						■		■		■			■	4	25
Constraints of rice production															
Insufficient access to equipment /	■	■	■	■	■	■	■	■	■	■	■	■	■	13	64
Poor water mgt (leads to droughts/floods)	■	■	■	■			■	■	■	■	■	■	■	11	50
Soil degradation/ low soil fertility	■	■	■			■		■			■	■	■	8	61
High weed, pest and disease pressure	■		■			■	■		■	■		■	■	8	37
High input costs (fertilizers)/ shortage	■	■	■			■		■	■		■	■		8	54
Weak access to agriculture financing	■	■	■		■	■	■				■			7	32
Young farmers discouraged	■	■			■	■				■	■			6	20
Low technical capacity			■			■	■		■			■		5	80
Low return on rice prodcution	■	■	■			■						■		5	70
Political instability/insecurity		■					■	■	■	■				5	50
Insecure land tenure		■			■		■							4	25
Weak access to processing facilities				■	■	■						■		4	25
Weak access to market		■							■					2	20

% resp: % of respondents as average of the marked countries (beneficiary consultation survey in March 2021).

49. The greatest opportunities (Table 8) to improve the rice sector productivity lie in making labor-saving equipment available, which both reduces drudgery and increases returns through more efficient use of human labour. In addition, restoration of soil fertility and integrated soil and water management, in combination with the SRI practices, has been identified as a key opportunity both to increase rice production and to develop sustainable systems that are more resilient to climate change. Political support for the rice sector is widespread, and successful project results can be expected to attract broad attention.

Table 8: Adaptation measures and opportunities proposed for rice sector interventions for the 13 countries (survey responses)

Adaptation measures/opportunities	Ben	BF	CDI	Gam	Gha	Gui	Lib	Mal	Nig	Nga	Sen	SL	Tog	sum	% resp
Use equipment for labor saving	■	■	■	■	■	■	■	■	■	■	■	■	■	13	65
Soil conservation practices	■	■	■	■	■	■		■	■	■	■	■	■	12	41
Diversification of crops and income	■	■	■	■		■	■	■	■	■	■		■	11	53
SRI practices (bring higher return)		■	■		■	■	■	■	■		■		■	9	46
Good water management practices		■		■	■	■		■	■		■		■	8	32
Political support rice (nat strategies)		■				■	■	■	■		■	■	■	8	45
Land areas for expansion available		■		■		■	■		■			■	■	7	30
Local markets exist		■		■		■	■				■	■	■	7	55
Rice farmers organizations ready	■	■		■		■		■		■	■			7	65
Technical capacity strengthening			■	■	■		■					■		5	80
Direct processing				■	■		■			■		■		5	35
Strengthen youth rice growers				■		■		■	■					4	40
Strengthen women rice growers				■		■		■						3	50
Integrated Pest Management									■	■		■		3	35

% resp: % of respondents as average of the marked countries (beneficiary consultation survey in March 2021).

50. The concrete adaptation practices and measures of the RICOWAS project focus on the implementation of CRRP practices, which are composed of SRI and location-specific SLWM and IPM practices. A technical note on the announced concrete adaptation measures and best practices for CRRP (SRI and SLWM) is presented in Annex 8. CRRP practices strive to optimize ecological and biological processes to improve rice plant growth and productivity. These practices are synergistic in their application and concern ***all stages*** of the rice production process from seed preparation to harvest. Best practices have been identified over the past 20 years for different rice systems and climate zones at the global level and in West Africa. RICOWAS will build on the best practices already implemented in the 13 countries, and continuously improve the practices in a participatory manner together with farmers with the objective of scaling-up. As CRRP is knowledge intensive, its implementation success will depend on how well farmers understand the biological processes behind the use of certain practices, and how well they are able to implement the CRRP practices in their own fields. To address this, the RICOWAS project will strive for highest quality of knowledge-sharing, be it via trainings, assisting and advising farmers directly in their fields all along the rice production stages, and facilitating knowledge-sharing events. In addition, the project will provide access to tools and equipment that support

the CRRP production and post-harvesting activities. These elements are key for a sustainable and effective scaling-up of CRRP as farmers will have obtained the capacity and means to pursue climate-resilient rice farming beyond the project's timeline. The implementation of a core set of SRI and SLWM practices will be the starting point for the project, but the project will remain flexible and participatory to modify and add practices that are locally well adapted. The technical module approach adopted by the project supports that process. The project's focus on integrating SLWM with SRI practices is key for strengthening the rice systems' resilience to climate change as stronger, healthier rice plants with deep root systems can better resist drought and flood events, storms and strong winds, as well as pest and diseases. A summary of CRRP best practices to be implemented by RICOWAS is shown in the table below.

Table 9: Summary of CRRP best practices as implemented by RICOWAS in irrigated, rainfed lowland and rainfed upland rice systems

	Irrigated system	**Rainfed lowland system**	**Rainfed upland system**
Seed management	Seed selection, harvest, cleaning, storage (set of practices)	Seed selection, harvest, cleaning, storage (set of practices)	Seed selection, harvest, cleaning, storage (set of practices)
Seed production	Best practices for quality seed production with SRI (bundle of identified and specific practices throughout cropping season)	Best practices for quality seed production with SRI (bundle of identified and specific practices throughout cropping season)	Best practices for quality seed production with SRI (bundle of identified and specific practices throughout cropping season)
Seed preparatio before planting	Seed soaking, discarding unviable seeds with salt-water method	Seed soaking, discarding unviable seeds (seed drying before planting)	Seed soaking, discarding unviable seeds, seed drying before planting
Transplanting of seedlings	Raised bed nurseries, marking strategies, root protection in uprooting and planting, shallow transplanting of 8-12 day old single seedlings	Raised bed nurseries, marking strategies, root protection in uprooting and planting, shallow transplanting of 8-12 day old singl seedlings; Change in planting calendar if indicated	Only in places with enough soil moisture, otherwise not appropriate, change in planting calendar if indicated
Direct seeding	Adapted drum seeder for paddy	Adapted drum seeder/ dryland seeder	Adapted dryland seeder
SRI-CRRP water management	Alternate Wetting and Drying (AWD) irrigation	AWD, bunding, SMART-Valley approach, drainage canals, change in planting calendar to avoid flooding periods, short season rice varieties	Bunding of fields, SMART-Valley approach (if appropriate), contour plowing, mulching of soil surface, organic matter application to improve soil water storage, water storage tanks and wells for supplemental irrigation, short-season rice varieties
Soil preparation	Incorporation of crop residues and other organic matter, field levelling, earthen bunds; introduce reduced tillage (conservation agriculture practices) where possible	Incorporation of crop residues and other organic matter, field levelling, earthen bunds; introduce reduced tillage (conservation agriculture practices) where possible	Incorporation of crop residues and other organic matter during plowing OR minimum tillage, surface mulching; earthen bunds, field levelling where possible
Organic fertilizer use	Straw and other crop residues, animal manure, compost, green manure, cover crops (between seasons), cattle grazing on crop residues between cropping seasons; industrial organic fertilizer	Straw and other crop residues, animal manure, compost, green manure, cover crops (between seasons); cattle grazing on crop residues between cropping seasons; industrial organic fertilizer; surface mulching, intercropping or relay-cropping with legumes (e.g. cowpea), crop rotation	Straw and other crop residues, animal manure, compost, green manure, cover crops (between seasons), cattle grazing on crop residues between cropping seasons; industrial organic fertilizer; surface mulching, intercropping or relay-cropping with legumes (e.g. cowpea), crop rotation
Chemical fertilizer use	Complement organic fertilizer with 1/2 of recommended dosage, Urea deep placement	Complement organic fertilizer with 1/2 of recommended dosage, Urea deep placement	Complement organic fertilizer only if needed and when enough rainfall
Weed management	Cono-weeder, Mandava weeder	Cono-weeder, Mandava weeder, dryland weeder	Integrated weed management, including seed cleaning, use of mechanical dryland weeder, summer plowing, efficient fertilizer and water management, mulching, rotations
Pest and diseases management	Locally appropriate IPM methods, including seed treatments, use of farmyard manure for soil health, remove hosts (weeds), soil puddling, use bio-pesticides (e.g. neem), timely and reduced use of nitrogen fertilizer, crop residue management or removal, adjust planting calendar, use resistant varieties	Locally appropriate IPM methods, including seed treatments, use of farmyard manure for soil health, remove hosts (weeds), summer plowing, timely and reduced use of nitrogen fertilizer, use bio-pesticides (e.g. neem), adjust planting calendar, use resistant varieties	Locally appropriate IPM methods, including seed treatments, use of farmyard manure for soil health, remove hosts (weeds), summer plowing, timely and reduced use of nitrogen fertilizer use bio-pesticides (e.g. neem), adjust planting calendar, use resistant varieties

51. A closer look at the project zones, vulnerabilities and constraints, adaptation measures and opportunities for each of the countries is summarized below:

52. **Benin**

The project zone will include the four rice production basins of the country: i) the Alibori and Bourgou districts in the Northeast, ii) Atakora in the Northwest, iii) Collines in the Center, and iv) Oueme, Plateau, Mono, Atlantique and Kouffou in the South. The total population in the project zone is 2.4 million people (20% of Benin's population), of whom only 28,513 are rice farmers, 24% being female. The project will work directly with 7,128 (or 25%) rice farmers on 7,061 ha of land in the project zone. 54% of the farmers will be women, who have been identified as being more vulnerable than the male farmers.

Vulnerabilities and constraints: Because rainfed systems are the most common in Benin, dry spells - common during the growing season - can cause major damage during plant establishment and the grain-filling period. Additional constraints are soil degradation in all zones, weed pressure, and the lack of labor-saving equipment.

Adaptation measures and opportunities, in combination with the SRI method, include restoring soil fertility (via composting and green manuring), improving plot development (levelling, bunding of plots), and use of equipment to decrease smallholder labor, reduce drudgery, and lessen production costs, all of which can make farming more attractive to young people. Many institutions in Benin (including the strong National Rice Farmers Association) are favorable toward SRI and have gained some initial expertise in its implementation. There is a very high interest in implementing holistic climate-resilient rice production methods. Post-harvest activities, such as parboiling and direct marketing of rice, are of special interest to women's groups.

53. **Burkina Faso**

The project zone will include 22 communes, located in six of the 13 regions where rice is grown. The population in the project zone is 7.75 million people, of whom 195,000 are rice farmers, comprising 2.5% of that population. The project will work directly with 6,830 farmers (of whom 43% will be women) on 2,142 ha. Rice in Burkina Faso is grown mainly in the rainfed lowland system and irrigated systems. The average land area does not exceed 0.25 ha per household. Although the SRI method has been introduced to all rice-producing zones, the adoption rate is still relatively low.

Vulnerabilities and constraints: the largely degraded irrigation infrastructure makes it difficult to access and manage water properly, and under different circumstances, this lack of control can lead to both flooding, or to inability to access the available water. The rainfed lowland systems are highly vulnerable to flooding and drought. Labor shortages and lack of equipment result in high production costs. Often farmers do not know how to manage or improve soil fertility. Farmers do not always make a profit, which especially discourages young people from farming. Other threats include insecure land tenure and weak access to markets and credits.

Adaptation measures and opportunities: Burkina Faso has large untapped land areas that can be transformed for rice production. National development and agricultural strategies favor the expansion of rice production to satisfy existing national markets for local rice. Introducing labor-saving equipment and improved soil fertility via composting, in combination with yield increases through SRI, can contribute to much more profitable rice farming systems.

54. **Côte d'Ivoire**

The project zone will include 32 communes, one in each of 32 departments, located across 25 regions. The aim is to create innovation hubs throughout the country from where CRRP can be introduced and then scaled out. A range of rice production systems exists in all regions, from rainfed lowland and upland systems to seasonally flooded rice areas without water control, to irrigated systems with water control. The project will work directly with 3,392 farmers on 3,199 ha of irrigated and rainfed lowland systems. Overall, the population of the project zones includes 575,000 rice farmers, who make up 54% of the total population of these areas.

Vulnerabilities and constraints include low technical capacity of both farmers and the government agricultural extension service, lack of equipment, high dependence on expensive fertilizers, poor water management, low soil fertility, and high weed, pest, and disease pressures. All these lead to generally low rice yields and overall low profitability. **Adaptation measures and opportunities** Despite all the constraints, Côte d'Ivoire is one of the top rice producers in the region. There is much potential for sustainable expansion as the rice sector recovers from a long period of political unrest. The RICOWAS project plans to implement a holistic package to make rice production more profitable by using the SRI method, increasing access to equipment for production and processing, dissemination of available high-quality varieties, and improving soils with organic matter.

55. **The Gambia**

The project zone: Scaling-up will be done in four regions covering the entire eastern part of the country (Upper River Region), the central part (Central River Regions North and South), and the northern part (North Bank Region), which together make up the rice food basket of the country. The dominant rice systems are rainfed lowland and irrigated systems. The project zone includes 276,000 people, about 10% of the national population. The project will work directly with 8,485 rice farmers, of whom 81% will be women, on 2,122 ha with a total of 47,210 rice farmers in the project zone.

Vulnerabilities and constraints: Erratic rainfall is a major threat to rice production in the Gambia, often resulting in flooding, dry spells, and delays at the start of the cropping season. Insufficient control of tidal water flow and inadequate irrigation infrastructure often lead to poor water management. Lack of access to farm implements, especially to post-

harvest and processing equipment, impedes the economic development of rice farming communities. Climate change predictions foresee that the Western Sahel will be increasingly affected by reduced and erratic rainfall.

Adaptation measures and opportunities: Most rice farmers in The Gambia are women. Equipment adapted for use by women, such as lightweight mechanical weeders, can significantly improve their labor efficiency. Land for rice is available and farmers have expressed a high interest in improving their methods and skills, especially for integrated soil and water management. Strengthening the value chain through local milling and other post-harvest processing of rice would allow farmers to reap added benefits from their crops. Many rural youths in The Gambia are discouraged by low margins in agriculture and migrate to the city to find income. Mobilizing youth to participate in value chain opportunities will be crucial for the future of a vibrant rice sector and rural livelihoods.

56. Ghana

The project zone: Rice is produced in all regions in Ghana. The RICOWAS project will work in seven regions: Northern, Savanna and Upper East (in the North), Volta and Oti (in the Southeast), Ashanti (in the Center) and Western North region (in the West). The Northern, Savanna and Upper East regions alone account for 77% of national rice production. SRI was introduced to all areas during SRI-WAAPP, but only a relatively small number of farmers were able to benefit, and there have not been any significant follow-up activities since then. By focusing on these seven well-distributed regions out of 16 in total, it is expected that important CRRP hubs will be created within Ghana, from where the methodology can spread within each region as well as to other regions in the country. The project will work with 13,173 rice farmers, of whom 22% will be women, implementing CRRP on 10,176 ha.

Vulnerabilities and constraints: The Northern and Upper East regions are in the northern savanna zone where the effect of climate change is severe. Climate change forecasts for Ghana include a decrease in rainfall, more erratic and intense rainfall during the rainy season, and rising temperatures, all of which are predicted to lower rice yields or even lead to crop failure. Most rice production systems are rainfed, and average rice yields are still very low. The level of mechanization is very low and the ability to process, package and market rice is very limited, despite a large national demand for local rice. Women and youth are the most vulnerable groups involved in rice production, as it is difficult for them to access land and/or agricultural credits.

Adaptation measures and opportunities: Scaling-up CRRP can help mitigate adverse effects of climate change by increasing yield, and by creating healthier and stronger plants that better resist drought and heavy rainfall. As a food and cash crop, rice can support food security and generate income for smallholder farming families. Technical training for women and youth associations along with access to production and post-harvesting equipment will strengthen not only their own livelihoods but those of rural communities as a whole.

57. Guinea

The project zone: The project will work in seven prefectures in the four regions of Guinea: Upper Guinea (Faranah, and Mandiana prefectures), Middle Guinea (Mamou prefecture), Maritime Guinea (Boffa and Kindia prefectures) and Forested Guinea (Kissidougou and Gueckedou prefectures). The project will work in lowland rice systems (Kindia, Mamou, Guekedou), on alluvial plains (Faranah, Kissidougou, Mandiana), and in the mangrove rice system (Boffa). Adaptation of SRI to all these different systems will be an innovation. The project will work in rural areas that are in proximity to towns, in order to develop marketing mechanisms to sell rice to urban populations and allow the 5,600 project beneficiaries (28% will be women) to grow climate-resilient rice on 2,220 ha and to economically benefit from different activities along the entire rice value chain. The project zone has a population of 540,000 people, which is 4.2% of Guinea's population.

Vulnerabilities and constraints: Main constraints for rice production are poor soil fertility, iron toxicity, and acidity of soils, in addition to high weed, pest, and disease pressure. With climate change, Guinea will experience greater variability of rainfall, with an increase in rainfall during the rainy season and a decrease of rainfall in the North, along with a greater risk of drought due to variable rainfall in combination with rising temperatures. Integrated soil and water management approaches will be essential to improve resiliency towards unpredictable climate change. Insufficient skills and knowledge, inadequate incentives, limited government support, and lack of access to equipment, processing and credit leave farmers in the rice sector very vulnerable. Rice producers are mostly poor, and rural youth often emigrate to find employment in the mining zones.

Adaptation measures and opportunities: The number of rice farmers is very high in Guinea, and there is still much suitable and unused land available for rice production. Rice is a priority crop for the government and demand for local rice is quickly increasing. Strengthening the existing rice farmer federations will be a good entry point to disseminate CRRP practices. With the SRI method, farmers can produce their own high-quality seed from good existing varieties. Use of compost, a well-proven method in Guinea, can help to improve the depleted and acidic soils.

58. Liberia

The project zone: Rice is produced in all regions of Liberia and is the primary staple with a yearly per capita consumption of 91kg, almost double the average of West Africa as a whole. The project will be implemented in six regions of the western and northern parts of the country: Lofa, Nimba, Bong, Bomi, Grand Gedeh, and Montserrado. The northern part includes the most productive rice zones, with rainfed lowland and some irrigated systems. The project zone has a population of over 1.37 million people, which is 27% of Liberia's population. The project will directly work with 13,620 farmers, of whom 66% will be women, growing climate-resilient rice on 2,741 ha.

Vulnerabilities and constraints are multiple for the rice sector in Liberia: lack of good infrastructure (irrigation, storage, processing), limited human and technical capacity, weak extension services, non-secure land tenure, lack of access to credit, political instability, as well as the impact of climate change on the agriculture sector.

Adaptation measures and opportunities: Large land resources exist to expand rice production. Although Liberians prefer local rice, 60% of the consumed rice is still imported. Strengthening the rice sector is a priority for the government. Demand for SRI training is high in Liberia as a means to reduce poverty by increasing yields and farmers' incomes and thus creating more opportunities for employment along the value chain.

59. **Mali**

The project zone: Mali is one of the largest rice producers in the region, with a wide variety of rice systems, including highly productive irrigation schemes. The RICOWAS project will work in the central, western and southern regions, but not in Mopti, Timbuktu and Gao, due to safety issues. Scaling-up SRI has become a governmental priority, as shown by the adoption in 2020 of the first African national program to scale up SRI. The project zone covers the regions of i) Kayes (Kita and Bafoulabe districts (called circles)), ii) Sikasso (Yanfolila and Sikasso districts), iii) Koulikoro (Kati and Kangaba districts) and iv) Ségou (Niono, Sirbala, Segou and San districts), and includes irrigated systems, rainfed lowland systems, and seasonally flooded plains. The project zone has a total population of 521,000 people, which is less than 3% of the national population. The project will work with more than 18,000 rice farmers on 9,403 ha.

Vulnerabilities and constraints: Most pressing constraints are soil degradation, inefficient water management, and insufficient access to labor-saving equipment.

Adaptation measures and opportunities: Building on best practices developed in Mali, RICOWAS will emphasize capacity strengthening and technical assistance for CRRP (including SRI and improved soil and water management practices), aiming to create economic benefits beyond what has been achieved so far. Another focus will be to reinforce the access to rice production equipment and strengthen the integration with post-harvesting processes, which will further contribute to the development of a thriving rice sector in Mali.

60. **Niger**

The project zone will include the four regions of Tillaberi, Dosso, Tahoua and Zinder, covering a total of nine communes. The project will work on irrigated and rainfed lowland systems in Tillaberi and Dossa, and on rainfed lowland systems in Tahoua and Zinder. The total number of farmer-beneficiaries will be 10,981, of whom 4% will be women. The low number of women reflects the fact that rice farming in Niger is almost exclusively done by men. The total population in the project zone is 571,400, 2.5 % of Niger's population. SRI was introduced in the irrigated systems along the Niger River under the SRI-WAAPP project. Under RICOWAS, the project will work with farmers growing rice on a total area of 3241 ha in the irrigated system, but will also expand to the rainfed areas, where there is a large potential for expansion but is also more vulnerable to climate change.

Vulnerabilities and constraints: Rice production has recently become a priority for the Nigerien Government, as self-sufficiency in rice is only about 20% and Niger has the highest population growth in West Africa. Technical assistance for improving rice production is currently insufficient, the post-harvesting and marketing system is weak, inputs and equipment are not readily available, and flooding events and drought conditions are increasing.

Adaptation measures and opportunities: The potential to increase rice production is large, as there is much unused land suitable for rice production. The RICOWAS project can assist in introducing and expanding climate-resilient rice production practices that will reduce variability and benefit farmers immediately. Nigerien youth are interested in rice production if it produces a good return. Good technical training and technical assistance will be important for CRRP to take a strong foothold. Many techniques have been tested, proven and are available to be implemented in Niger: compost making, preparation of levelled and bunded plots, installation of supplemental irrigation, and the use of integrated pest management, including bio-pesticide applications.

61. **Nigeria**

The project zone: The RICOWAS project will be implemented in five States: i) Jigawa (Auyo, Miga and Jahun Local Government Areas), ii) Niger (Lavun, Wushishi, Katcha Local Government Areas), iii) Nasarawa (Doma, Obi, Awe Local Government Areas), iv) Gombe (Yamaltu-Deba, Balanga and Kaltungo Local Government Areas), and v) Ebonyi (Ikwo, Afikpo-North, Ohaukwu Local Government Areas). In Niger, Jigawa, Gombe and Nasarawa states, the rice systems are irrigated and rainfed lowland, while in Ebonyi State rainfed lowland dominates. The project will select, train, and equip 1200 lead farmers on 500 ha, who will in turn train every year their neighboring farmers through the Farmer Field School approach, training, and field visits for a total of 28,800 farmers in four years. This will result in a total of 30,000 farmer-beneficiaries, with 33% being women, planting 15,000 ha of CRRP rice. 2.46 million people are living in the project zones, 1.2% of Nigeria's population.

Vulnerabilities and constraints: At 2.2 t/ha, average rice yields in Nigeria are still very low. Erratic rainfall associated with droughts or floods can create a major disruption in the rice production process. Pest and disease pressures can be high, especially in the central and southern parts of Nigeria. Land tenure is traditional. Conflicts often arise as people try to access land. Women and youth are most often denied access to land and to participate in a vibrant rice sector. **Adaptation measures and opportunities** Rice self-sufficiency in Nigeria was 56% in 2017. Creating a strong foothold and dissemination in these five States will allow the promotion of the CRRP techniques at the national level, especially if integrated into some large and influential rice investment projects by bilateral and multilateral donors and the private sector. National rice farmer associations (RIFAN and AFAN) are important stakeholders to be mobilized in the scaling-

up process. Important contributions to be integrated with SRI and CRRP include best practices developed for improved soil and water management, compost making, integrated pest and disease management; assisting farmers to access equipment for soil preparation, weeding, planting and threshing; and making improved post-harvest and processing technologies available at the local level.

62. Senegal

The project zone: The RICOWAS will be implemented in four project zones: i) Senegal River Valley: regions of Matam and Saint-Louis, ii) Peanut basin (Center of Senegal) regions of Kaffrine, Kaolack and Fatick, iii) Upper Casamance: regions of Tambacounda and Kedougou and iv) Lower Casamance, regions of Ziguinchor, Sedhiou and Kolda. The project will work in the irrigated rice systems of the Senegal River Valley, while all other zones will be rainfed lowland systems. A total of 102 communes are included in the 10 regions where rice is grown, indicating that RICOWAS is using a national approach to scale up CRRP. The 10 regions cover 81% of the territory and include 47% of the population of Senegal. The RICOWAS communes include 2.08 million people, 12.7% of the total population. The total number of project beneficiaries will be 14,245, of whom 57% will be women, growing rice on 6213 ha.

Vulnerabilities and constraints: Rice is a very important crop in all the project zones, but yields remain low. SRI was introduced to most zones under the SRI-WAAPP and through other partners, but it has not yet been disseminated at the larger scale. The rainfed lowland rice systems are potentially very productive but suffer from insufficient levelling and bunding of plots, which makes them vulnerable to flooding and droughts. Other main constraints are the lack of small-scale mechanization and the non-respect of the cropping calendar.

Adaptation measures and opportunities: Rice is the major cash crop in the irrigated areas. Farmers are well organized and processing plants are in place. Scaling up of SRI and CRRP here will create an impact on rice self-sufficiency at the national level. In the rainfed lowland areas, assisting farmers with training, technical assistance in CRRP, and providing access to equipment will significantly increase rice productivity and improve resiliency. The National Executing Entity, ANCAR Agricultural Services, has field agents throughout the project zones. These agents were trained on SRI during SRI-WAAPP and are motivated to expand and scale-up SRI with their respective farming communities.

63. Sierra Leone

The project zone: Rice is the main food crop in Sierra Leone. It has the highest annual per capita consumption of rice in West Africa, 164 kg., and more than 70% of farmers grow it. The project will establish hubs for CRRP dissemination in 38 communes across 10 districts in the four large Northern, Western, Eastern and Southern regions. The dominant rice growing systems in Sierra Leone are the rainfed lowland system (also called Inland Valley Swamps or IVS), and rainfed systems on large alluvial plains (also known as Boliland). 1.67 million people, which is 21.4% of the country's population, live in the project zone. The project will directly work with 15,000 farmers, of whom 9 % will be women, on 3000 ha. This low number of women is because most rice farming in Sierra Leone is done by men.

Vulnerabilities and constraints: Rice systems in Sierra Leone are mostly rainfed, and thus more vulnerable to the effects of climate change than are irrigated systems. Overall investment in the rice sector remains low, both in the development of irrigation infrastructure and in the post-harvest and processing infrastructure. Farmers lack access to credit, inputs, and equipment. High poverty among the rural population makes it very difficult for farmers to move beyond subsistence farming. Soil degradation is a widespread phenomenon due to poor soil fertility management, including erosion and landslides, which have become a serious problem in certain areas. With climate change, it is predicted that the intensity of single rainfall events will increase, as will temperatures, resulting in increased crop failures, higher pest and disease pressure, and reduced food security.

Adaptation measures and opportunities: With seven freshwater rivers crossing the country, large land areas still uncultivated, and a large domestic market for rice, there is a very large potential to expand for rice production. Highly productive and adapted varieties developed for the different rice ecosystems are available. SRI is the best method to multiply seed and to disseminate new varieties, as it uses only 10% of seed as compared to conventional methods. Capacity strengthening of extension agents and farmers, based on good technical training on SRI, IVS field levelling, compost making, and integrated pest and diseases management practices, will be key to successfully scale up CRRP. Better access to equipment and local processing facilities will allow farmers to grow rice more profitably.

64. Togo

The project zone: Project will scale up CRRP in all five regions of Togo: Maritime, Plateaux, Centrale, Kara, and Savannas, covering the four agro-ecological zones: littoral, forest, humid savanna and dry savanna. The project will focus on irrigated and rainfed lowland systems, working in 33 communes directly with 21,958 farmers, of whom 53% will be women, on 5003 ha. This is 3.5 % of all rice farmers in Togo, which number 635,223 in total.

Vulnerabilities and constraints: Main constraints include i) advancing soil degradation in rice-producing areas, ii) the difficulty to manage water properly for irrigation, iii) a weak seed production sector, iv) the appearance of new pests and diseases, and v) the change in rainfall patterns, which already delays and disrupts the rice planting seasons. In addition, growing seasons are predicted to grow shorter in the future due to decreased rainfall and rising temperatures.

Adaptation measures and opportunities: Togo enjoys several factors to support the development of the rice sector: high-performing varieties, good technical assistance services, new innovative financing mechanisms, and availability of land and water resources. Government policies support rice production expansion to supply existing local markets. Integrated soil, water and pest management methods, developed by the national research institution, are available to be implemented. Farmer demand is high across the country for SRI training and technical assistance. Many aspects are

aligning in Togo, and it can be expected that the national impact of implementing the CRRP approach through the RICOWAS project, will be substantial.

2. Project Objectives

65. The global objective of the project is to improve climate resilience and increase rice system productivity of smallholder rice farmers across West Africa using a climate-resilient rice production approach. More specifically the project will:

- Strengthen the resilience and capacity of smallholder rice farmers and other rice stakeholders in the region to use agroecological and sustainable land and water management strategies that respond to the climate change threats in their respective localities.
- Assist farmers to implement and scale-up Climate-Resilient Rice Production (CRRP), and to participate in other economic activities of the rice-value chain.
- Support a communication platform and engage in advocacy to promote efficient exchange of knowledge and expertise among diverse stakeholder groups in West Africa and beyond.
- Facilitate the establishment of a coalition of partners at national and regional levels for the scaling-up of CRRP.

3. Project Components and Financing

Table 10: Project components, expected outcomes, outputs and financing

Project Components	Expected Outcomes	Expected Outputs	Countries	Amount (US$)
C1: **Strengthen human and institutional capacity in CRRP**	1.1. Climate change dimension in the regional Rice Offensive strategy and the National Rice Development Strategies integrated	1.1.1. Climate change dimension and proposed actions integrated into the regional and national rice strategy documents	All 13 Countries	300,000 (3%)
	1.2. Key stakeholders operating in different climate zones and rice systems gained tools, knowledge and skills to successfully address climate threats and implement CRRP in a sustainable way	1.2.1. Capacity of national and regional research centers strengthened	All 13 Countries	322,000 (3%)
		1.2.2. Institutional capacity of the regional and national executing entities for project implementation strengthened	All 13 Countries	461,500 (4%)
		1.2.3. Extension institutions involved in the development and dissemination of SRI and CRRP strengthened	All 13 Countries	565,000 (4%)
			Subtotal component 1	**(14%) 1,648,500**
C2: **Assist farmers to scale-up CRRP**	2.1. Smallholder rice farmers in the project zones successfully adopted SRI and CRRP practices, achieved higher rice productivity, and improved their incomes and livelihoods.	2.1.1. Smallholder rice farmers in the project zones strengthened their livelihoods by reducing production costs and improving rice yields through the adoption of SRI and CRRP	All 13 Countries	6,383,000 (54%)
		2.1.2. SRI and CRRP practices - adopted by smallholders in the project zones - monitored, analyzed and the results widely shared	All 13 Countries	815,000 (7%)
	2.2. Rice value chain strengthened through public-private partnerships (PPP) and agricultural associations and cooperatives, and thus improved the resilience of smallholder rice farmers to the harmful effects of climate change	2.2.1. Rice production and post-harvest components in the rice value-chain strengthened	All 13 Countries	1,035,000 (9%)
		2.2.2. Agricultural associations and cooperatives the rice value chain strengthened in their operations	All 13 Countries	887,500 (7%)
			Subtotal Component 2	**(77%) 9,120,500**
C3: **Strengthen communication, advocacy and partnerships to scale-up CRRP**	3.1. Awareness and knowledge of CRRP in West Africa greatly increased	3.1.1. Knowledge and awareness materials developed and widely disseminated, in response to the demand and needs of different stakeholder groups	All 13 Countries	515,000 (4,5 %)
	3.2. Partnerships and coordination strengthened to enable the mainstreaming of CRRP in West Africa.	3.2.1. Synergies among partners established to mainstream CRRP in West Africa	All 13 Countries	515,000 (4,5%)
			Subtotal Component 3	**(9%) 1,030,000**
4. Project Execution cost (9,5%)				1,120,905
5. Total Project Cost (100%)				12,919,905
6. Project Cycle Management Fee charged by the Implementing Entity (8,34%)				1,080,095
			Total	**14,000,000**

4. Projected Calendar

Milestones	Expected Dates
Start of Project Implementation	January 2022
Mid-term Review (if planned)	February 2024
Project Closing	February 2026
Terminal Evaluation	August 2026

PART II PROJECT JUSTIFICATION

A. Description of the Project components

66. The RICOWAS project will adopt a comprehensive approach known as the **Climate-Resilient Rice Production or CRRP**, which is uniquely developed with and for this project. CRRP will be based on the SRI methodology as the core element, but it will simultaneously integrate critical practices of sustainable soil and water management and include integrated pest management. This allows a more holistic and sustainable approach to the climate change challenges that threaten rice production while improving farmers' livelihoods and contributing to national food security. West Africa contains four agricultural climate zones that run-in east-west horizontal bands across the region. Each of the climate zones crosses five to ten of the 13 countries participating in this project. There are three rice production systems (irrigated, rainfed lowland and rainfed upland) found in all of the countries, and some specialty systems (e.g., mangrove, recessional, and deep-water) are found in a few. As most countries cross more than one climate zone, it makes sense to use a regional approach to develop and implement the best practices of CRRP based on climate zones and rice systems, and not be limited by national boundaries. Experience and innovations developed in one country can be easily shared with other countries crossing the same climate zone and/or rice system. Additionally, a single operational framework can pool expertise from across the region, work with a common understanding and share lessons learned. The groundwork for such regional collaboration was laid during the SRI-WAAPP project, which set up an institutional support network and a community of practice for SRI common to all 13 countries. The RICOWAS project can build directly on these lessons. It would be much more expensive and cumbersome, if not impossible, to implement this project under 13 separate national programs. Finally, this project will directly contribute to the implementation of the "Rice Offensive" initiative that targets rice self-sufficiency for West Africa by 2025, a major program of the ECOWAS' Regional Agricultural Policy for West Africa (ECOWAP).

COMPONENT 1. Strengthen human and institutional capacity in climate-resilient rice production (CRRP)

67. The objective for this component is to strengthen the resilience and capacity of smallholder rice farmers and other rice stakeholders in the region to use agro-ecological and sustainable land and water management strategies that respond to the climate change threats in their respective localities. Based on the expertise mobilized and the knowledge gained by the project, it is planned to engage in a policy dialogue to strengthen CRRP as a major component of the national and regional rice development strategies. Inputs will consider the current and predicted impacts of climate change on the rice sector, and identify, enumerate, and discuss practical means to implement successful adaptation strategies and SRI-CRRP activities. The SRI-CRRP is an agro-ecological and climate-smart approach to agriculture, best described as a principle-based and knowledge-intensive approach to develop adaptation solutions at the local level. Emphasis is therefore put on strengthening the capacity of research, extension services, public and private agricultural training schools, as well as the of RICOWAS' regional and national executing entities. Executing entities will be supported in taking a leadership role at regional and national levels, which directly strengthens institutional sustainability.

Outcome 1.1. Climate change dimension in the regional Rice Offensive Strategy and the National Rice Development Strategies integrated

Output 1.1.1. Climate change dimension and proposed actions integrated into the regional and national rice strategy documents

Activity 1.1.1.1. Analysis of the impacts of climate change on rice production in West Africa

68. The project will undertake a regional study to analyze the impact of climate change on the rice sector in West Africa, both currently occurring and as predicted for the future. The study will include recommendations for clear actions to i) minimize the impacts of climate change on rice production in West Africa, ii) improve the adaptive capacity of the rice production systems to the climate change threats, and iii) identify how the rice production systems can be managed in order to contribute to climate change mitigation and adaptation, thus become part of the solution to address climate change. The Regional Executing Entity (REE) will develop the Terms of Reference (ToRs), and procure international consultancy services to conduct the study and will be assisted by national consultants as needed. The Regional Implementation Entity (RIE), will provide support to the consultant(s). The provisional version of the study will be pre-validated by RIE, REE and NEEs.

Activity 1.1.1.2. Regional validation workshop and dissemination of the regional study

69. The pre-validated provisional version of the study will be presented and discussed during a regional workshop for its final validation. This workshop will be organized by REE. Participants will include NEEs, Ministerial focal points for climate change and other relevant national entities. The validation workshop will also benefit from the contributions and participation of climate change specialists from regional and international organizations inter alia. The final study and associated results will be shared and widely distributed in the region, using the project's communication channels (Component 3).

Activity 1.1.1.3. Development of rice sector adaptation action plans for climate change to be integrated to the Rice Offensive Strategy (ROS)

70. REE will procure international consultancy services to elaborate the recommendations of the regional study (Activity 1.1.1.1) into action plans. This will identify pathways, concrete strategies and actions for the rice sector to adapt to

climate change to be integrated into the Rice Offensive Initiative. This will further support pathways and harmonized mechanisms for the integration of the recommendations into the National Strategies for Rice Development.

Activity 1.1.1.4. Regional validation workshops and dissemination of the rice sector adaptation plan

71. A regional workshop will be organized by RCoS-Rice for the validation of the study (Activity 1.1.1.3). Workshop participants will include the stakeholders involved in the implementation of the Rice Offensive Initiative at the national and regional levels. To assure the adoption of the proposed recommendations, the workshop participants will decide on the mechanisms of large-scale dissemination of the validated strategies and actions to be integrated into the Rice Offensive. This also includes Monitoring & Evaluation (M&E) mechanism to monitor the implementation of the activities as well as their outcomes.

Activity 1.1.1.5. Development and dissemination of rice sector briefs and methodologies to integrate climate change adaptation to rice value chain

72. At the national level, based on Activities 1.1.1.1 through 1.1.1.4, recommendations and concrete actions will be summarized in technical documents as they are relevant to the conditions of the regional and national rice sectors, including all aspects of the rice value chain. Representatives from the different value-chain segments (from production to marketing) will actively participate in the development of these action plans, in order to assure their relevance to the on-the-ground reality and to take into account concerns but also opportunities that each segment puts forward. If these contributions are well integrated, scaling-up of CRRP along the value-chain will be made possible and the adaptive capacity of the various parts of the rice value chain strengthened. These action plans can then also be integrated into the rice sector strategies and programs, including the National Strategies for Rice Development.

Outcome 1.2. Key stakeholders operating in different climate zones and rice systems gained tools, knowledge and skills to successfully address climate threats and implement CRRP in a sustainable way

Output 1.2.1. Capacity of national and regional research centers strengthened

Activity 1.2.1.1. Support the development of SRI-CRRP adapted rice growing practices, equipment and tools

73. Researchers will collaborate with farmer associations and the private sector to test and adapt new and already available equipment and tools for the SRI-CRRP system and specific local environments. Special attention will be paid to reducing drudgery, and environment-impacting techniques. New appropriate equipment from other countries (e.g. Asia and East Africa) will be introduced and adapted to the local conditions. Training sessions with a gender lens will be organized to ensure that women and youth have the requisite skills to use innovative and user-friendly tools and equipment. Intercontinental cooperation will also be developed. Training of local artisans, mechanics and equipment operators will assure sustainable use and servicing of the equipment and tools as well as promoted industries through reverse engineering appropriateness. REE will assist in facilitating equipment dissemination across national borders. This activity will consequently involve the recognition of safety standards related to tool productions, processes for securing rights to use the tools and provided equipment according to the national laws in the 13 countries as indicated in table 22. Researchers will also team up across the region to develop and share best practices on various CRRP innovations for each climate zone and rice system. They will also collaborate on writing research papers together and publish the RICOWAS results.

Activity 1.2.1.2. Establishment of a regional technical group to review the advancement of SRI and CRRP best practices

74. A regional technical CRRP innovation group will be set up, composed of one research and one extension specialist from each country, a specialist from the REE and one from academia. The goal is to improve rice productivity while at the same time reinforce the adaptive capacity of the project's SRI-CRRP rice systems. The group will review and identify best practices for the SRI methodology and associated land and water best management practices i) as implemented in Asia, Latin America and other parts of Africa, ii) from the scientific and technical literature, and iii) as developed at the local level by communities themselves or NGOs, etc. The group will also iii) review the findings and emerging innovations from the RICOWAS project zones. Based on this cross-cutting analysis, new technical training modules will be developed, and existing ones revised (Activity 1.2.3.2).

Output 1.2.2. Institutional capacity of the regional and national executing entities for project implementation strengthened

Activity 1.2.2.1. Undertake capacity needs assessment

75. A capacity needs assessment study will be conducted in the first year by the REE and NEEs. The focus will be on the key project stakeholders: the extension services, the regional and the national executing entities, as well as the beneficiary farmers. The assessment will inform the review of activities and allow for measuring transformational change at project completion. During the assessment, a Knowledge, Attitude and Practices (KAP) survey will be undertaken by the RIE to measure the KAP of the project partners through the application of both qualitative and quantitative methods using data collection tools such as focused group discussions inter alia.

Activity 1.2.2.2. Undertake demonstration field visits at national and regional level to share and exchange good practices

76. In conjunction with the national and regional meetings, field visits will be associated. Practices that are executed in the countries be replicated to support knowledge and experiences regarding the implementation of the activities under the project can be shared. The experiential visits will be organized starting from the second year of the project onwards, as the first lessons learned gained from the project will become apparent. The NEEs will identify those farmers that are most appropriate to share experiences as well as learn from others. Where necessary, the project will provide

translators to facilitate communication. Importantly, at the national level, field visits can be combined with other stakeholder or project meetings to reinforce collaboration and synergies at the subnational levels.

Activity 1.2.2.3. Acquisition of necessary logistics material to support field implementation

77. The NEEs in all the RICOWAS countries are facing several constraints, particularly in logistics. So as to minimize potential adverse effects on the RICOWAS project implementation, key logistics materials will be acquired under the legal procurement policy of the NEEs. The proposed materials will be pre-approved by the REE (CRoS-Rice) and the RIE (OSS), and formal approval obtained by the national and regional steering committees. The materials might include, among others, office and communication equipment, including computers and internet access to efficiently implement the data collection and tracking process under activity 2.1.2.4. as well as other materials that support efficient field implementation of the activities.

Activity 1.2.2.4. Support the process of upscaling the REE and strengthening its capacities to promote SRI-CRRP- in the region

78. The Institute d'Economie Rural (IER), where the REE is housed, maintains a multimedia unit at the IER research center in Niono, Mali. The project will strengthen this unit on the thematic of SRI and CRRP. The project will support the IER communications specialists in the dissemination of regional and aggregated national project results. The IER communication specialists will also actively provide support to countries and assist in their communications reporting on project activities and disseminating project results. CRoS-Rice is in the process of transitioning to become a Regional Center of Excellence sponsored by ECOWAS under the leadership of CORAF/WECARD. The Government of Mali is committed to supporting this process by providing adequate infrastructures (labs, equipment, land etc.) and qualified personnel. The project will support the establishment process, in the area of SRI-CRRP.

Output 1.2.3. Extension institutions involved in the development and dissemination of SRI-CRRP strengthened

Activity 1.2.3.1. Undertake Training-of-Trainer (ToT) workshops on SRI-CRRP

79. Agriculture extension institutions play a key role in the RICOWAS project. They will be in charge of directly training and technically assisting the project beneficiaries across the region. It is therefore critical for the RICOWAS project to engage and support the government extension institutions, NGOs and farmer associations to undertake technically rigorous, thematically appropriate and practice-relevant ToT workshops at the regional and national levels in years one and two. The regional workshops will provide an in-depth introduction into the topical background to create a common understanding of the SRI methodology and associated CRRP practices. The regional ToTs will provide the national ToTs with training materials and modules that can be adjusted to national and local conditions and to train the national extension service providers. The regional ToT will be organized by REE, with technical support from identified thematic experts. The national ToTs will be organized by the NEEs and undertaken by the regionally trained trainers. In the first year of the project, the ToT workshop will focus on SRI. The subsequent workshops will focus on the integration of best practices in soil, water, and crop pest and disease management according to climate zones and rice systems.

Activity 1.2.3.2. Develop, revise and produce training materials and modules for SRI, SLWM and other relevant CRRP technical topics

80. The training materials will follow a multi-levelled approach. At the regional level, the concepts and principles of SRI, climate-smart rice production and sustainable land and water management will be introduced, making sure the RICOWAS project implementers share a common understanding of SRI-CRRP. Specific manuals for each of the climate zones and rice systems will be produced, integrating technical specificities. These manuals will be reviewed and improved on a regular basis in a collaborative effort between the national teams and the regional technical SRI-CRRP innovation group (see Activity 1.2.1.3). This should allow taking into account the national specificities while pursuing a climate zone approach. As mentioned under activity 1.2.3.1., particular modules can be added as needed, complementing the already existing technical materials. The module approach of training allows to have some flexibility and to address specific constraints or take advantage of existing innovations and practices that are available and ready to be scaled up.

Activity 1.2.3.3. Support farmer field implementation of CRRP by extension institutions with adequate materials and resources

81. Extension services will be in charge of training farmers, providing technical assistance in the field and collecting data from farmers' fields. Undertaking these tasks efficiently requires materials and resources. This includes computing resources, internet access, materials and equipment to support theoretical and practical training sessions, undertake rice field monitoring as well as processing recorded data and information.

COMPONENT 2. Assist farmers to scale-up Climate-Resilient Rice Production (CRRP)

82. The objective of this component is to assist farmers to implement and scale up SRI-CRRP and to participate in other economic activities of the rice-value chain. This component is where the expected and concrete impact of the project will happen. Rice farmers in 13 countries, across all climate zones and rice systems, will be the direct project beneficiaries, implement and adopt CRRP practices in their fields, and benefit in multiple ways from doing so (see sections B and C below). They will be selected under the responsibility of the National Executing Entities. The selection process will be based on regional guidelines that will take into consideration procedures implemented during the SRI-WAAPP project and be in line with the guidelines and requirements of the Adaptation Fund. Project zone selection

and identification of project beneficiary categories during project proposal preparation were based on the results from the vulnerability assessment, the consultative process with project zone stakeholders (see Part I section 1, and Part II, section I.), as well as rice production importance and rice improvement potentials at the national level.

83. By using the SRI-CRRP approach, rice production will be more climate-resilient, better withstand droughts and floods, yields will increase, the need for irrigation water and chemical inputs will be reduced, and rice grain quality will be improved. Beyond production, the project will support farmer groups, especially women and youth, to access production factors and post-harvest technologies, which will create employment and allow farmers to obtain higher profits while supplying the national market with good-quality rice. Although this is a scaling-up project, the project will have to re-engage with the farming communities and from there create a scaling-up approach where the spill-over effect to other farmers is expected to be generated. In addition, by mobilizing partners (Activity 3.2.1.2) and by developing the national networks (Activity 3.2.1.4), RICOWAS will target to reach indirect beneficiaries in the region.

Outcome 2.1. Smallholder rice farmers in the project zones successfully adopted SRI-CRRP practices, achieved higher rice productivity, and improved their incomes and livelihoods

84. This outcome, is considered as the main section dedicated to the concrete adaptation activities which budget is around 82% of this outcome, that benefit smallholder farmers and aim to strengthen the resilience of the rice sector in the region. It is structured around a number of agricultural practices adapted to climate change. The majority of the practices to be carried out are well known and presented in table 9. However, given the diversity of the agro-climatic zones where the project will intervene, certain parameters cannot yet be well defined, such as the exact location of the infrastructures and their dimensions, the varieties of seeds and the specificities of the agricultural practices to be put in place, etc. These activities are therefore considered as USPs according to the AF policy and require the deployment of a specific methodology to ensure compliance with the AF and OSS standards as the accredited entity.

Output 2.1.1. Smallholder rice farmers in the project zones strengthened their livelihoods by reducing production costs and improving rice yields through the adoption of SRI-CRRP

Activity 2.1.1.1. Support the adoption and scaling-up of best practices of SRI in farmers' fields

85. The SRI-WAAPP project has identified and tested best practices for SRI that are adapted to the irrigated, rainfed lowland and rainfed upland systems. SRI is knowledge intensive, and its implementation success will depend on how well farmers understand the biological processes behind the use of the different practices, and how well they are able to best implement the SRI practices (and the SLWM practices) in their own fields. This will require solid technical exchange and fine-tuning. The RICOWAS project strives for i) highest quality of knowledge-sharing, be it via trainings, assisting and advising farmers directly in their fields, and by facilitating knowledge-sharing events, ii) participatory development of locally adapted best practices for SRI (and SLWM) together with farmers in their fields, and iii) providing access to tools and equipment that support the adoption of SRI (and SLWM) (see 2.1.1.5.). The major best practices for the different rice systems are summarized in Table 9 in Part I.

Activity 2.1.1.2. Promote and assist farmers in executing SLWM practices in association with their SRI fields

86. SRI was developed in irrigated rice systems. The core practices for water and soil management refer to Alternate Wetting and Drying (AWD) and the application of organic matter such as compost as a base for fertilization. These main practices are limited. AWD is not applicable to most rainfed systems, and using compost is only one of many practices to improve soils and to provide nutrients to plants sustainably. Most importantly, the sustainable pathway for rice production to better adapt to climate change lies within sustainable and integrated soil and water management. RICOWAS will therefore holistically focus on integrating simultaneously several SLWM practices, including proven traditional practices, together with the more standard SRI practices. The same implementation approach as explained under 2.1.1.1 will be applied to guarantee for farmers to fully understand the underlying ecological and biological processes and to take ownership of CRRP. A multitude of practices, which differ quite considerably for the different rice systems, are presented in Table 9 in Part I. These practices require additional details and information for their execution on field and are considered as USPs according to the AF guidelines as per the compliance with the ES and Gender policies.

Activity 2.1.1.3. Promote and assist farmers in rice seed, rice seedling and organic fertilizer production

87. Farmers' first concern at the start of a new season is to have access to healthy, productive, and pure seed. Complaints about seed quality – mostly referring to poor seed germination or the mixing of varieties - are widespread among West African rice farmers. With the SRI method seed production becomes surprisingly easy, which represents a unique potential to address one of the most pressing problems in rice production. RICOWAS will promote seed production with project farmers to either produce seed for personal use or the market. To this end the project is planning to establish seeds nurseries with the farmers that complies with the selection criteria and are committed to the project. The nurseries dimension, production capacities and compliance with the national standards will be defined during the project implementation phase.

88. Similarly, there is a big potential for farmers to produce their own organic fertilizer or to produce a fertilizer that can be sold. RICOWAS will support this through farmer-to-farmer trainings and through the PPPs as indicated under 2.2.1.4. Best practices from around the world offer a large array of methods, ranging from composting with different raw materials, quick composting methods, vermi-composing, to producing compost tea, among others. The project will adopt the most adapted composting techniques based on a consultative approach and considering the potential impact on the environmental and social aspects using the USPs methodology given that these techniques will require further assessments. Setting up farmers to become seed and fertilizer producers reinforces further the rice communities' self-

determination and diversifies their income. The likelihood for the project to create long-lasting economic impact will be strengthened despite the threats of climate change.

Activity 2.1.1.4. Provide farmers with technical expertise to implement best practices for CRRP

89. RICOWAS will build on the innovative implementation approach developed during the SRI-WAAPP project, which was based on SRI-Champions, highly competent and motivated individuals that were very efficient in the dissemination of SRI. Among them were farmers, extension agents, researchers as well as highly positioned political decision-makers. In addition, RICOWAS will use each country's best-practice implementation approach, be it farmer-field schools, community-based learning, farmer-to-farmer approach where more experienced CRRP farmers mentor less experienced farmers. Farmer trainings and technical assistance in the field throughout the growing season will be rolled out and specifically designed to reach women and youth. Extension materials, such as leaflets and posters, will be put together and distributed to farming communities, based on training modules developed under component 1. CRRP best practice knowledge will be translated into popular versions and local language for easy understanding by smallholder farmers, women and youth.

Activity 2.1.1.5. Provide farmers access to equipment and tools to implement SRI-CRRP

90. The SRI method involves a change in practices. For this, it is essential to provide tools to improve labor efficiencies such as the mechanical weeders, which facilitate weed control under irrigated or rainfed systems, a marking rake, the SRI direct seeder and hand tractors. The mechanical weeders are critical for the adoption of climate-resilient rice production. Without it, farmers might revert to the continuous flooding practice, which uses a lot of water, emits more greenhouse gases, and produces much less vigorous plants that have difficulty withstanding climate threats. SRI direct seeders allow reducing family labor load and labor cost, especially for rainfed rice, which represents a large portion of the rice systems in the project zones. RICOWAS will multiply weeders and SRI seeders and distribute them within the project zones and will ensure a full compliance with the national technical standards during the production of the required tools. Rakes can be made by farmers themselves if they can access the materials to do so. As SRI uses much fewer chemical inputs but focuses on building up soil fertility via organic matter, funding will not be needed for fertilizer or pesticide purchases or subsidies. This activity is implemented in conjunction with 2.2.1.3.

Output 2.1.2. SRI-CRRP practices - adopted by smallholders in the project zones - monitored, analyzed and the results widely shared

Activity 2.1.2.1. Develop and test data tracking methodology and mechanism on the implementation of SRI and CRRP

91. During the SRI-WAAPP project, a monitoring and evaluation system was developed using a participatory process including the NEE of all 13 countries, the REE and Cornell University for the monitoring of SRI field practices and the reporting of project results. This allowed for an informed exchange of results during the yearly regional workshops and for aggregating the data into a regional analysis. The RICOWAS project can build on this foundation and improve on the mechanisms for data collection, aggregation and storage. At the beginning of the project, data collection and storage capacity in association with the NEEs will be assessed in each country, and a mechanism will be set up that allows for reliable monitoring and data collection. At the start of the project, REE in collaboration with Cornell University and OSS will develop a data tracking methodology (which includes an app and automated dashboard system), that responds to tracking field performance and innovation development and includes the monitoring of the project indicators. The methodology will be tested by the NEEs and implementing partners. It will then be adjusted and improved, based on feedback from end-users and by the acquisition of necessary equipment and data storage facilities.

Activity 2.1.2.2. Implement the baseline study on rice production and value-chain characteristics

92. Baseline information has already been assembled at a considerable level. During the SRI-WAAPP project, a baseline study was conducted that included SRI, rice production and value-chain characteristics. This was further complemented by the final SRI-WAAPP project reports. All of that data and documentation is available with the NEE and the REE. Moreover, during the RICOWAS project preparation process, important data for baseline information was collected using a comprehensive questionnaire. It addressed the site specificities, SRI status, and community livelihoods inter alia. During project execution, REE will hire a consultant who will develop a detailed baseline using data and information from the national baseline established by consultants hired by the NEE. This activity will provide a good understanding and an update of the project sites' situation.

93. This activity will be one of the first tasks to be carried out after the official launch of the project. In addition, to its objective of updating the status of the project sites and strengthening the consultative process that was already undertaken in the various stages, it will define guidelines and provide recommendations for activities that include USPs and the methodology to be adopted by all national and regional executing entities. This baseline will also constitute an opportunity to have a deepest mapping of the project stakeholders, beneficiaries and partners as well as to refine the selection criteria established during the funding proposal design phase (*see selection criteria page 32*). Therefore, any potential environmental and social risks not identified during the development of the project document for activities with USPs will be well-identified. This will ensure that all the necessary measures will be adopted in consultation between OSS and the executing entities to be compliant with AF and OSS procedures as well as national regulations and technical standards.

Activity 2.1.2.3. Provide agents of national institutions and extension services, researchers and smallholder rice farmers with the expertise to use the data tracking methodology

94. Once the data tracking methodology developed under 2.1.2.1 is validated, a regional ToTs workshop and national trainings will be organized by the REE and NEE in using the data tracking tools. The goal is to roll out a simple but solid methodology that allows extension agents and even farmers to collect data in a decentralized manner, which will be assembled and quality checked at the national level by an M&E officer under the supervision of the NEE. The regional training will be designed to train the national M&E officers, responsible for the national data. They in turn will train the field agents at the national level undertaking the field data collection. The national data will be shared with the regional M&E officer who is associated with REE to create the regional reports.

Activity 2.1.2.4. Update the data analysis and CRRP tracking database annually and publish its key performance indicators and results on the project website

95. The national M&E officer will capture the data coming from the field and conduct Quality Assurance and Quality Control (QA/QC) on it and then assemble it for tracking of project performance indicators and for monitoring the rice production improvements under CRRP. The data from the national level will be assembled by the regional M&E officer, who is attached to the regional coordination unit of the project. REE in collaboration with Cornell University and OSS will ensure that national and regional M&E officers' capacity is strengthened to successfully manage the project data tracking system as well as the national and regional dashboards and databases. To this end, the REE will organize a validation workshop after two years of implementation. The M&E officers will produce annual reports, which will be published on the project website.

Outcome 2.2. Rice value chain strengthened through public-private partnerships (PPP) and agricultural associations and cooperatives, and thus improved the resilience of smallholder rice farmers to the harmful effects of climate change

96. The main expected result of this outcome is to strengthen the links between the different stakeholders in the rice sector at the level of the project countries. Partnerships will be signed between the public and private sectors and will serve as an engine for improving rice production and strengthening the local, national and regional markets. Indeed, the PPP will be able to develop and distribute production, processing, value-adding and marketing equipment. During the consultative process adopted for the project design, it was noticed that the equipment, tools and packaging to be developed were dependent on specificities related to the end users as well as the targeted communities in the different countries. Given that additional assessment and further details are required to execute these activities described below, the USPs methodology will be applied since the project inception.

Output 2.2.1. Rice production and post-harvest components in the rice value chain strengthened

Activity 2.2.1.1. Establish networks and create partnerships between private companies and producer cooperatives

97. RICOWAS project will contribute to strengthening the rice value-chain through the establishment of partnerships between various stakeholders involved in the rice sector. The NEE with the support of the REE will conduct a stakeholder mapping to identify the relevant private companies and producer cooperatives to be brought on board. The NEEs will assess the ongoing activities and initiatives to determine the roles each of these involved stakeholders play. The National Facilitators (NF) will then act as conveners, coordinators, facilitators to bring together the different stakeholder groups and explore what types of concrete collaborations and partnerships can be developed. The REE will assist countries in stakeholder engagement at the regional level and connect regional or multi-country stakeholders to the national teams. The establishment of these partnerships will be ensured via a series of meetings and the setting up of an operational committee.

Activity 2.2.1.2. Generate PPP for the development and supply of innovative agricultural equipment and their provision to farmers

98. Equipment and tools - that improve CRRP labor productivity and reduce the drudgery of rice field work - were identified and tested under Activity 1.2.1.2. Also, under the same activity, local artisans, mechanics and equipment operators were trained. The NEE and the REE will play a facilitating role in ensuring that appropriate equipment is disseminated in sufficient numbers to the rice farming communities. For better ownership and sustainability, the equipment needs to be produced by local operators. The project will support cooperatives and farmers to acquire the appropriate equipment such as mechanical weeders, marking rakes, levelling bars, seeders, trans-planters, moto-tillers/hand tractors inter alia. Building on the SRI-WAAPP project experience, RICOWAS will engage with local enterprises such as SOCAFON (Société Coopérative Artisanale des Forgerons de l'Office du Niger) in Mali, to support their role in producing sufficient numbers of new equipment (weeders, seeders) adapted to SRI, and to ship them to other countries as well as promoting the innovation process and to produce high-quality equipment.

Activity 2.2.1.3. Generate PPP for threshing, processing, packaging and marketing of climate-resilient rice for vulnerable groups

99. Post-harvest processing is often decoupled from production in West Africa rice farming communities. It is either out-sourced (paddy is sold to outside millers) or undertaken at an artisanal scale by women to satisfy imminent household needs. Much economic potential resides in capturing the value-addition created during the post-harvesting process by the farming communities themselves and therefore contributing to a diversification of income. The NEEs will identify opportunities for farming communities and connect them with partners from the private sector, finance institutions and

value-chain development projects to source their own post-harvesting equipment. This includes threshing operations, improved parboilers and small-scale milling equipment.

100. The project will also apply a particular focus to work with women and youth groups, who are among the most vulnerable groups in the West Africa rice sector, to overcome critical constraints in developing new sources of income. Supporting women and youth groups by (e.g., small mills, improved parboilers) will allow women and youth to directly reap the benefits from value-added processing. Being in charge of the process, the women and youth groups can control the quality of the end product. The possibilities for these groups to sell their rice under their own packaging and brand enables them to target consumer groups, e.g., urban consumers, and obtain a better price for a higher quality product. Success stories from the SRI-WAAPP project exist (e.g., women's cooperative Les Femmes Vaillantes d'Anié of Togo, who tripled their income), and can be used as an example in leading the efforts of the RICOWAS project.

101. The project can build on current marketing innovations in the region that focus on high-quality premium rice. With the SRI method, rice produces larger and fuller grains, and thus has naturally a higher quality compared to conventional rice. Taking advantage of the SRI, rice quality becomes therefore an obvious choice when improving the options for processing and marketing. An interesting example to capitalize on, refers to the local NGO AMAPAD, one of the SRI pioneers not only in Burkina Faso but Africa. AMAPAD is currently in the process of creating the first organic certified SRI rice in Africa, in collaboration with the international certifier ECOCERT. The RICOWAS project will support such opportunities, share methodologies and lessons learned and engage actively in the scaling of high-quality, premium-priced, and well-branded and marketed climate-resilient rice. The REE will assist countries in stakeholder engagement at the regional level and connect regional and /or multi-country stakeholders to the national teams.

Activity 2.2.1.4. Generate PPPs for the supply of organic fertilizers and rice seeds produced by smallholder farmers

102. Based on stakeholder assessment under 2.2.1.1, the NFs will facilitate further exchanges and connections to develop business partnerships for the production and dissemination of organic fertilizers and rice seeds. As a regional project, RICOWAS can draw from specific country-based experiences, share the success stories and promote successful business models to be taken into account and adopted by the other countries. Successful examples already exist in the region, for instance, the partnership development between communities and the company Elephant Vert in Mali for the production and distribution of organic fertilizer. Organic fertilizers can be sourced from farmers who practice animal husbandry, which will be used as soil amendment in SRI Rice fields. Such partnerships can create economic opportunities among stakeholders in the agriculture sector and strengthen farmer cooperatives in enhancing their business models.

103. The SRI method allows the production of high-quality rice seeds, which can be marketed at a good price before the planting season. This will require adequate storage facilities for the rice seeds between the seasons. The project will strengthen the capacity of farmer associations to develop business models for organic fertilizer production as well as rice seed production.

Output 2.2.2. Agricultural associations and cooperatives in the rice value chain strengthened in their operations

Activity 2.2.2.1. Reinforce and assist in the establishment of agricultural associations and cooperatives

104. West Africa is characterized by well-organized farmer associations that take on different forms, such as platforms, cooperatives, federations and inter-professions. The RICOWAS project will concentrate its effort by taking advantage of the regional umbrella organization CRCOPR (Cadre Régional de Concertation des Organisations de Producteurs de Riz d'Afrique de l'Ouest), specialized in the rice sector, and part of ROPPA (Réseau des Organisations Paysannes et des Producteurs Agricoles de l'Afrique de l'Ouest), the regional umbrella organization for all farmers in West Africa. The REE and NEE will assess and strengthen the capacities of the existing organizations and assist in the establishment of new ones taking into account the most vulnerable farmers to climate change with a focus on women and youth. The PPPs (activity 2.2.1.1) will support in the training and hosting at the newly established cooperative at the local level. In fact, special attention will be made to consider the most vulnerable farmers to CC impacts as well as women and youth. Training topics can include, among others, how to establish business models, rice processing opportunities, proper storage of rice, opportunities for innovative packaging and marketing of rice. The RICOWAS project in collaboration with the established PPP entities will support the farmers' associations and cooperatives at the local level in establishing the needed facilities to run their day-to-day businesses.

Activity 2.2.2.2. Provide and reinforce advisory services to agricultural associations and cooperatives

105. The NEE will engage in regular communication on advisory services with rice associations and cooperatives operating in the project zones. Based on RICOWAS' training opportunities at the national and local level, the NEE will ensure a collaborative and inclusive approach towards supporting the established PPPs and representatives of the associations and cooperatives with training sessions on specific topics based on demand and opportunities, either related to the SRI and CRRP or on post-harvesting processes. More specifically, this can include trainings on best practices for post-harvest rice bulk storage, and for rice processing (milling, parboiling) to produce high-quality rice products that can be sold at scale. These trainings will be undertaken by national consultants. The distribution of training manuals, leaflets and posters will support these advisory services.

Activity 2.2.2.3. Provide assistance to agricultural associations and cooperative in accessing and managing agricultural credits and subsidies

106. The Project will assist newer and smaller associations and cooperatives in creating business plans and in accessing credits, subsidies and grants. Once the relationships between financial institutions and cooperatives are well

established, the project can further strengthen the association members' capacity in successfully managing their operations. To do so, the project can either hire consultants for specific tasks or mobilize expertise.

Proposed selection criteria of community investments and beneficiaries

107. The people and/or communities that will be most affected by the project activities in accordance with the ESMP of the RICOWAS project will be targeted for implementation of SRI-CRRP in a sustainable way. Such vulnerable members of the population are for instance communities/people whose properties or sources of income have been affected by the project.

108. The views/opinions of such people will be considered and will be prioritized such that deliberate efforts are made to reach out to the most vulnerable members of such communities. Furthermore, the most vulnerable members among the smallholder farmers such as the women and youth will be prioritized as beneficiaries to adopt SRI and CRRP practices.

The selection criteria will be updated as soon as the project is effectively launched and include but **not limited to**:

109. **Criterion 1: Land use and land ownership:** The farmers living on sites or lands where the project actions are planned to be developed and works to be implemented by will have priority. The project will support the selection of a number of integrated rice cultivation systems related to SRI-CRRP methods. To benefit from project services, farmers must be active, resident smallholder farmers in the project locality, already engaged in producing rice crops. Consideration will be given to the:

- Farmers participating in different cooperative production modalities which will allow them a greater capacity to adapt or assimilate the changes in production that the project will bring about, and are readier to work in groups and more inclined to share knowledge with others.
- Farmers willing to assimilate new knowledge, with leadership capacity and willing to apply science and technology on their farms and production areas.
- Farmers who have developed different experimental production models and who are positively inclined to participate in up-scaling processes.
- Organizations who will be identified based on alignment between the proposed activities and the organizations' mandates, expertise and/or services delivered and territorial representation in the project target areas.

110. **Criterion 2: Vulnerability:** The most vulnerable groups that heavily rely on the rice production in the proposed project areas for their livelihoods and are most exposed to hazards risks will be selected for the project activities. Target beneficiaries include farmers most threatened by the impacts of CC, especially those whose rice fields are driest and/or most affected by hurricanes and torrential rains. Women and youth will be deliberately prioritized.

111. **Criterion 3: Gender:** Deliberate effort will be made to ensure that at least 40% of the target beneficiaries are women. This will be done in consultation with local leaders and representatives of women's group. To ensure proper involvement of the community investments and beneficiaries, a good selection of beneficiaries is required based on the criteria above to be rated on a scale from 0 (non-existent), 1 (very low or few) to 5 (very good or a lot). There is a difference between a farmer association that serves its members and a SME or a private investor, who will access and manage agricultural credits and subsidies. A grid will be utilized and further developed based on the baseline assessment and a guide will be developed during the project inception phase to assist in the development of this criteria and included in the Project Implementation Manual (PIM). An example is highlighted in table 11:

Table 11: Criteria for selection of community beneficiaries and investments

Criteria	0	1	2	3	4	5
General Information						
Number of members of farmer organization (FO)						
Number of active rice farmers in the community						
Number of farmers willing to integrate rice value chain						
Need for supplementary food during dry period						
Gender consideration						
Infrastructures						
Access to electricity (tri phase)						
Access to water						
Access to road network						
Existence and condition of a warehouse (protection against theft and rain) for storage of by products and feed blocks						
Drying area (existence, condition and size) for rice						
Organizational and financial capacity of FO (farmer organization)						
Availability of management documents						
Existence of a bank account						
Available financial means (liquidity)						
Capacity of members to mobilize working capital						
Experience in collaborating with financial institutions (credit)						
Experience in bulk sale or purchasing						
Existence of a management and control committee						
Transparent elections / renewing of committee members						

COMPONENT 3. Strengthen communication, advocacy and partnerships to scale up CRRP

112. The objectives for this component are i) to support a communication platform and to engage in advocacy to promote efficient exchange of knowledge and expertise among diverse stakeholder groups in West Africa and beyond, and ii) to facilitate the establishment of coalitions of partners at national and regional levels for the scaling-up of CRRP. Component 3 complements the other two as it aims to create awareness, share solutions, and mobilize partnerships for scaling up CRRP, thus ensuring the long-term sustainability of project activities. As project achievements become known across a large network of partners and key stakeholders, it will become easier to take full advantage of the successes of the RICOWAS project and further spread CRRP in West Africa and beyond.

Outcome 3.1. Awareness and knowledge of CRRP in West Africa greatly increased

Output 3.1.1. Knowledge and awareness materials developed and widely disseminated, in response to the demand and needs of different stakeholder groups

Activity 3.1.1.1. Development of a communication strategy and plan.

113. Effective communication is vital for the scaling up of CRRP. The project will develop a communication strategy at the regional as well as the national levels. The REE will develop a regional communication strategy, which will serve for the national strategies as an overarching framework, assuring a harmonized approach. The REE will assist NEEs and propose a ToR template to the countries. The project will develop innovative knowledge management mechanisms for information exchange, experiential learning, knowledge creation and analysis, and dissemination and uptake of knowledge.

Activity 3.1.1.2. Development of a user-friendly web-based platform for SRI-CRRP methods

114. The regional communication hub, associated with the REE in Mali (Activity 1.2.2.4), will be in charge of developing and maintaining the project portal and populate it with knowledge products. It will also disseminate information about the project via interviews, photo stories, videos, and post news articles relevant to CRRP in West Africa. Social media platforms will also be included in the website and used as a channel for the large dissemination of project results. The REE and regional communication specialist will solicit country contributions. They will also assist countries in developing their communication materials. The platform will also serve to share results from the SRI-CRRP project results database, developed under activity 2.1.2.4.

Activity 3.1.1.3. Production of documents, videos, radio shows, maps.

115. Knowledge and awareness material production can be done through a web-based platform, published documents, videos, radio shows, posters, exchange visits, personal outreach and more. Knowledge products can include updates on project progress, farmer stories, lessons learned, technical fact sheets and manuals, and other materials to explain and illustrate climate change issues as they affect the rice sector. Presentation formats can be tailored to different audiences: farmers, policymakers, program developers, research and technical staff, and the public. The regional communication hub associated with the REE will be responsible to produce these materials and will be the responsibility of communication specialists at the regional communication hub associated with the REE in Mali (Activity 1.2.2.4.). It will also assist communications specialists in the 13 countries in the elaboration of their country-specific knowledge products. The national communication specialists are either part of the NEE or hired as consultants.

Activity 3.1.1.4. Organization of knowledge-sharing events and exchange visits at local, national, regional and global level including Asia, Latin America and other parts of Africa.

116. Personal interactions and exchanges are important instruments for knowledge-sharing and knowledge-creation, be it via technical working groups, field visits, workshops, or conferences. The project will organize such exchanges for farmers and partners from different countries working in the same climate zones, for specific interest or technical groups, and for women and youth responding to their specific interests along the rice value chain. The project will organize physical experiential visits in years two and three of the project. Much progress has been made, driven by the COVID pandemic, in connecting via online platforms. This new tool can be strategically used to strengthen knowledge and skills for the project participants. Online exchanges with SRI colleagues from around the world can be easily organized, benefiting from the worldwide SRI network of Cornell University.

Activity 3.1.1.5. Writing, dissemination and presentation of policy and advocacy briefs on climate adaptation strategies and project impact for rice production and its role in adapting to climate change.

117. As the systematic monitoring of project results, experiences, research findings (activity 1.2.1.1.) and success stories are coming in from the CRRP implementation, policy and advocacy briefs, as well as scientific articles, will be written. Topics shall include and not be limited to food security, rice productivity improvement, economic benefits and adaptation to climate change, among others. These publications can be targeted at national, regional or global levels. Project leaders of the NEEs and REE, and associated researchers and scientists, including from academia such as Cornell University, can publish analyses and recommendations about adaptation opportunities for the rice sector in West Africa. The published analyses will be of high relevance to the Rice Offensive and to the adaptation and mitigation strategies of the countries. These briefs and scientific articles can also become of global significance and provide guidance for Asian and Latin American countries in the adoption of CRRP and the adaptation to climate change.

Outcome 3.2. Partnerships and coordination strengthened to enable the mainstreaming of CRRP in West Africa

Output 3.2.1. Synergies among partners established to mainstream CRRP in West Africa

Activity 3.2.1.1. Setting up of operational mechanisms for information-sharing, networking, and coalition-building for the scaling-up of CRRP

118. The REE, NEEs and associated project partners will actively network and share information with stakeholders along the rice value chain at national, regional and international levels. The goal is to create alliances and build conglomerates to strengthen the sustainable scaling-up of SRI-CRRP, as well as the creation of new synergies and avoid duplication. For this, the REE and NEE will set up an operational mechanism to convene and exchange on a regular basis with partners interested in and involved with the sustainable scaling up of CRRP in West Africa. Partners can include multi-lateral, bi-lateral and private sector rice stakeholders and civil society such as farmer organizations and NGOs. An important role will be played by CORAF/WECARD, which has the mandate to facilitate collaboration and partnership building under the ECOWAS umbrella. Participation in global fora and climate change meetings such as the International Rice Congress, Sustainable Rice Platform meetings, and the UNFCCC Conference of Parties can strengthen alliances and create new partnerships. It will also allow to share project results and impacts and contribute to the identification of adaptation pathways for the rice sector at the global level.

Activity 3.2.1.2. Development of national networks that integrate all SRI-CRRP activities.

119. At the country level, national networks will be created, and annual meetings and field visits organized to share results, learn from each other, and develop integrated work plans for the scaling-up of SRI-CRRP. This activity will gain in importance as scaling-up progresses and more partners become active in the implementation of CRRP. The national facilitator will stay in contact with the network members throughout the year and seize opportunities for collaboration and synergies as they present themselves.

Activity 3.2.1.3. Organization of annual national events on rice and its linkage with climate change in West Africa

120. National meetings will serve to take stock on a yearly basis about project progress. It will bring all stakeholders together involved with CRRP (including those not funded by RICOWAS) to report on their activities throughout the past year. In a second step, a national CRRP activity planning will be undertaken and a national work plan elaborated. Again, it can contain both, RICOWAS activities as well as activities for other partners. As such, a unified national agenda is developed that enables synergies.

B. Promotion of new and innovative solutions to climate change adaptation

121. The RICOWAS project brings together a number of innovative approaches, technologies and mechanisms that complement each other to create a highly unique project. The most important are:

122. The climate zone and regional approach: Each of the four climate zones of West Africa crosses more than five of the 13 countries, and most countries are spread across more than one climate zones. The adoption of a regional and climate zone approach for scaling- up of climate-resilient rice production has multiple advantages: i) a larger group of people from several countries can collaborate on the same topics, ii) the innovation process can be accelerated, and iii) locally adapted innovations developed in one country can easily be shared with other countries working in the same climate zone and/or rice systems. The map of the project zones (Part 1) clearly depicts how smaller project zones at the border of one country can fuse into larger zones when combined with the border zones of their neighboring countries.

123. The RICOWAS project will adopt a new comprehensive approach titled **Climate-Resilient Rice Production (CRRP)**, which has been developed uniquely for this project. The CRRP approach is based on the System of Rice Intensification (SRI) methodology in combination with location-specific sustainable land and water management practices and, if indicated, integrated pest and disease management. SRI is an agro-ecological methodology, and as such relies on the management of ecological processes in rice production to improve biological efficiencies and rice productivity. The SRI method strives to create an optimal growing environment that enables the rice plants to express their genetic potential, while at the same time conserve and regenerate the natural resource base (including soils, water and biodiversity). More specifically, SRI is based on four crop management principles: (1) early plant establishment, (2) reduced competition among plants, (3) improved soil fertility management, and (4) reduced use of irrigation water. When these principles are followed, the rice plants grow more vigorously, develop higher tiller and panicle numbers and put down much deeper and larger root systems. These improved phenotypes can withstand adverse weather conditions such as drought, floods, and strong winds much better than rice planted using conventional methods, where older seedlings are planted closely spaced in flooded rice paddies, and where fertilizers and pesticides are used as crop management inputs. Compared to the conventional method, SRI rice yields increase by 20-50% and more, while using 90% less seed, 30-50% less water and 30-100% less agro-chemicals. As such, SRI displays the triple-win of the climate-smart agricultural method, which is based on three pillars: crop productivity improvement, adaptation to climate change, and mitigation of greenhouse gases. By 2021, SRI has been successfully validated in over 60 countries in Asia, Africa and Latin America[20].

[20] Country experiences of SRI implementation, monitored on website of the SRI International Network and Resources Center at Cornell University, in Ithaca, New York, Accessed at : http://sri.ciifad.cornell.edu/countries/index.html on April 17, 2021

124. The technical approach for implementing CRRP: This is important for this regional project, where participants will come together from very different environments and climate zones, to share a common understanding of CRRP. The technical approach adopted by the RICOWAS project will be built on a conceptual framework based on implementing consistent crop, soil and water management principles across the region. At the national or implementation level, these principles will be translated into specific practices adapted to local conditions. As an example, the principle of improving soils with organic matter can be translated into different practices, such as applying animal manure to the field, adding compost, or incorporating crop residues instead of burning them. The practice chosen to implement the principle will therefore be determined by the specificities of the rice system. Findings from these local experiences can then be pooled and best practices synthesized for the different climate zones and rice systems. Using an iterative and circular approach, these best practices can be improved upon and fine-tuned over the lifespan of the project. This highly participatory process integrates inputs from farmers, researchers, technicians, and brings in successful ideas and experiences from other parts of the world. The RICOWAS project will use a modular approach for trainings and technical manuals, covering CRRP topics as adapted to different climate zones and rice systems. This approach allows a common and shared understanding of CRRP at the regional level while developing and adapting innovations at the local level. This approach is often followed with agro-ecological methods such as conservation agriculture. It was also used by the SRI-WAAPP project and has been shown to work very well.
125. The project will build on current institutions, and strengthen their institutional and human capacities according to opportunities and needs. It will also rely on national decision-making and leadership in the implementation of the project. CRRP champions – including farmers, technicians among others – will be encouraged to participate in the project, based on their engagement and commitment to implement CRRP. RICOWAS will promote national networks and build on the regional community of practice for CRRP that already existed under the SRI-WAAPP project.
126. The CRRP approach is easily accessible to vulnerable groups, as it relies on simple agronomic changes, and is not dependent on outside resources or inputs to improve rice productivity. It provides and empowers communities and farmers with new opportunities to improve their livelihoods based on their own resources. Capacity strengthening of vulnerable groups will therefore be a priority for RICOWAS.

C. Economic, social and environmental benefits

127. CRRP, as applied by the project, is a “triple win” with environmental, social and economic benefits. The benefits in all categories will occur at the individual plot or family level, the community or landscape level, and the sub-national, national, climate-zone, and regional levels. The project design promotes activities that are both compliant and compatible with the Environmental and Social Policy of the Adaptation Fund.
128. CRRP as a methodology protects, improves, and regenerates natural resources while at the same time reducing negative environmental impacts. Project implementation will result in a multitude of **environmental benefits**, including improved soil health, water-saving, reduced emissions in greenhouse gases, reduced use of chemical fertilizers and pesticides, and improved biodiversity. Through organic matter-enriched soils, nutrient and water holding capacity in soils are improved, more carbon is stored, and beneficial soil biota supports crop nutrient uptake and protects against disease. This all builds the resilience of the rice cropping systems to climate change. By reducing the use of irrigation water by up to 50%, soil aeration is supported, which stimulates the root growth of the rice plants. It also results in a 30-50% reduction in methane gas emissions. Because SRI plants are healthier and stronger and the humidity in the plant canopy is reduced (unlike in permanently flooded fields), pest and disease attacks decline and pesticide use can be limited or omitted entirely. In case of a specific pest or disease problem, the project will implement the integrated pest management (IPM) approach. Biodiversity is also expected to increase. This includes i) beneficial soil biodiversity, thriving due to organic matter additions and reduced flooding, ii) rice diversity, as all rice varieties - including traditional ones - respond well to SRI methods, iii) crop diversity, as crop rotations are easier to implement following non-flooded rice, and iv) natural diversity, based on reduced pesticide use, and on less land area converted to rice production thanks to sustainable intensification.
129. Significant **social and economic benefits** are expected to occur from this project, as already witnessed by farmers in all 13 countries during the SRI-WAAPP project. With increased rice yields of 5842 kg/ha for CRRP compared to 3751 kg/ha with conventional methods (a 56% increase) (see table 13), more rice will be available for home consumption and marketing. RICOWAS project farmers will plant on average 0.46 ha of CRRP, producing therefore a yield of 2716 kg. With an average of 50 kg per capita consumption of white rice (in West Africa, see table 1), 780 kg of paddy rice should be sufficient to reach self-sufficiency for a family of 10 people. If 1500 kg were set aside for home consumption, farmers could still sell 1216 kg of the CRRP rice and earn 413 USD (at 0.34 USD/kg paddy, table 13). With the conventional method, only 244 kg could be sold for a total of 83 USD. This CRRP income can be used for other household needs such as schooling children, accessing health care, and/or investing in other economic activities. These trends have been recorded during the SRI-WAAPP project and many success stories were witnessed, especially involving women and young farmers. The entire rice value chain will benefit economically from increased production based on CRRP. This includes equipment sellers, seed producers (local nurseries) and organic fertilizer providers (composting units). Additionally, it can benefit community-based rice processing operations, including parboiling and milling, as well as marketing CRRP rice directly to end consumers. RICOWAS will actively support the creation of linkages and opportunities, especially for women and youth, to participate in these downstream and upstream economic opportunities and increase income and profit margin for the rice-producing communities. This integrated dynamic will create many jobs in the communities. Fewer people, especially youth, will migrate to the cities to look for income. In the post-harvest component of the value chain, the project will support the establishment of new

public-private-partnerships with 78 companies benefiting directly more than 1040 beneficiaries (output 2.2.1). RICOWAS will also strengthen at least 39 agricultural associations and cooperatives (output 2.2.2). The RICOWAS project will prioritize work with vulnerable groups. Most of the small-scale rice farmers – women and men - in West Africa constitute a large percentage of the poor. Among them, women and youth have been identified to be most vulnerable. Because SRI and CRRP are knowledge-based approaches, these vulnerable farmers - who often have limited access to financial resources - will be able to improve rice yields without having to buy inputs. Instead, they can rely on their own resources. Thus, once farmers have learned the methods, they can improve rice yields independently and on their own terms. This results in higher self-reliance and empowerment of the most vulnerable farmers. Farmers have used the SRI knowledge to further experiment and innovate, as have done the SRI farmers of Timbuktu, Mali as well as farmers in India growing wheat, doubling the wheat yield in turn. In the fourth year of the project, the 153,131 CRRP farmers will produce 175,000 tons of paddy rice *in addition* to what they would have produced with conventional production. This amount translates into 112,000 tons of white rice, with a value of 56 million USD. If the CRRP rice area remains the same, this benefit will be repeated every year. This increased rice production will reduce dependency on rice imports, currently a large burden for governmental budgets. But the yearly benefits are expected to expand as CRRP will take a permanent foothold in the project zones and be further disseminated through community-driven efforts. This project will directly benefit the most vulnerable parts of the population of the targeted African countries, where it is a well-known fact that men and women have defined socio-economic roles based on gender norms. Indeed, the project will deliver significant gender co-benefits through the implementation of the gender action plan (Annexe 3) to ensure women's participation and benefits, and to avoid negative social impacts.

D. Cost-effectiveness of the proposed project

130. **Advantage of the regional approach -** A regional approach will be the most cost-effective way to quickly create a long-lasting and significant impact for West African rice farmers as they adapt to climate change while increasing rice productivity. The groundwork has already been laid through the SRI-WAAPP, which established institutional support in all 13 countries and developed a regional community of practice for SRI. The partners' commitment to regional scaling-up of SRI and CRRP with the RICOWAS project was quickly confirmed from all 13 countries during all preparation stages i) the pre-concept note, ii) the concept note and iii) the full proposal of the RICOWAS project (see regional workshop report for proposal validation in Annex 5). By taking a regional approach, costs on many levels can be reduced. RICOWAS will work with a single operational framework in 13 countries. The project will develop a harmonized technical CRRP approach for the entire region, design common training approaches, stimulate regional research and invite a policy dialogue across the region. A common understanding and language of CRRP can be developed, which will catalyze the implementation of CRRP in the region. RICOWAS is not a pilot-project but a scaling-up project, thus developing a regional 'community-of-practice' is important, and momentum gained at the regional level will help in the scaling-up process and in reaching the next level of mainstreaming CRRP in the region. Implementing the project in 13 separate national programs would be much more expensive. But more than that, developed innovations would not be easily shared with other countries and scaling-up process would be considerably slowed down, and scaling-up opportunities not seized. This would have very large financial implications as the farming communities would not be able to efficiently adapt to climate change. A regional approach will also directly strengthen the implementation of the "Rice Offensive" initiative that targets rice self-sufficiency for West Africa by 2025, a major program of the ECOWAS' Regional Agricultural Policy for West Africa (ECOWAP).

131. **Alternatives considered for the cost-effectiveness analysis -** The RICOWAS project will create significant economic, social and environmental benefits and impact at the household level, the community level, the national, as well as the regional level. This cost-effectiveness analysis will assess two alternatives:

- Alternative 1: The alternative to the RICOWAS project of no-project-intervention, or the continuation of the sectoral approaches in rice production as currently underway in West Africa.
- Alternative 2: The scaling-up of climate-resilient rice production (CRRP) is the second alternative with its economic, environmental and social benefits that are expected to occur with respect to rice productivity, increase and livelihood improvements, environmental protection, mitigation benefits and adaptation to climate change.

132. The most important alternative rice production systems to the conventional irrigated and upland cultivation systems in West Africa include, in addition to SRI, the Alternate Wetting and Drying (AWD) irrigation rice system, the aerobic rice system and the direct-seeded rice systems (additional details are provided under Annex4) These systems strive to lighten the environmental footprint of rice production by reducing the use of irrigation water. They also target the reduction of input costs, most importantly costs for irrigation and labor. When considering yield, water saving and net return, the SRI system outcompetes these systems clearly as shown in table 12. The CRRP approach will further increase the benefits of the SRI system through its integrated soil, water, pest and disease management. Also, as CRRP is a variety-neutral approach, the use of climate-smart rice varieties is therefore complementary and not to be considered as an alternative to CRRP. Used together, they will boost the benefits for productivity and climate adaptation even further.

Table 12: Comparison of yield, water use and net return for four alternative rice systems to the conventional, flooded paddy rice system (at 100%)

Rice System	Yield (%)	Water use (%)	Net return (%)
Conventional, flooded paddy rice	100	100	100
Aerobic rice	50-85	45 -50	57
Direct seeded rice (DSR)	90	80	115
Alternate Wetting and Drying (AWD)	75-95	60-75	105-135
System of Rice Intensification (SRI)	130-180	50-80	195

Sources[21]

133. **Alternative 1: RICOWAS project is not implemented -** If the RICOWAS project is not implemented, CRRP and SRI are not scaled up, and adaptation measures in rice production are insufficient and lacking. Without adaptation measures, estimated reductions in rice yield across West Africa range from 5-25% and up to 80% depending on location and rice system. The largest decreases of 40% to 80% are mapped for irrigated rice cultivation in the Sahel zone in the hot dry season, and of 40% in the slightly cooler wet season. [22] In the Sudanian and Guinean climate zone, where rainfed systems dominate, rice yields will also be significantly affected. In the coastal areas, rice will be highly sensitive to the combination of increased temperature, humidity and rainfall intensity[23]. The widespread and common rice production practices in West Africa are either traditional, marked by low yields, or those that depend on irrigation water use and on agrochemical inputs, which are often neither affordable for smallholders nor environmentally sustainable. Vulnerability of current rice production systems can be summarized as follows: i) high dependency on high-volume water usage at high frequency, and with low water use efficiency, ii) high dependency on agro-chemical inputs (fertilizers and pesticides), iii) high dependency on newly bred rice varieties, iv) difficulties to distribute quality seed to farmers, and v) little attention paid to locally adapted soil and water management practices, crop varieties and cropping practices. With farmers trying to cope, it can be expected that pressure on natural resources will increase, be it on vegetation, soils and water, leading to overuse, natural resources degradation, declining food security, potential conflicts, rural exodus and international emigration. To mitigate these effects, introducing adaptation measures and strengthening resilience is a necessity.

134. Although climate change is a major concern in the current thinking and narrative of agricultural development in West Africa, adaptation measures have not yet been systematically integrated in the regional and national agricultural policies and strategies, including the Regional Rice Offensive, the National Rice Development Strategies, the Continental Investment Plan for accelerating Rice Self-Sufficiency in Africa (CIPRiSSA), which are still mostly based on input-oriented agricultural development. Addressing the increasingly negative impacts of climate change on rice production will require large sums of resources that need to be spent, among others, on: i) emergency food aid, ii) subsidies to keep the agricultural sector afloat, iii) subsidies to stabilize food prices, iv) increase in rice imports, v) disaster relief and rescue efforts in response to climate calamities, and vi) restoration of land and water resources.

135. **Alternative 2: RICOWAS project is implemented: CRRP is scaled-up throughout West Africa -** The proposed alternative to the current situation concentrates on the use of a new approach developed for this project called Climate-Resilient Rice Production (CRRP). CRRP is based on the rice productivity-increasing methodology of the System of Rice Intensification (SRI) and complemented with locally adapted and improved soil and water management practices (SLWM) as well as with integrated pest and diseases management methods (IPM). These approaches act synergistically in the adaptation to climate change. The System of Rice Intensification (SRI) is an agro-ecological and low-input methodology for improving rice productivity. It allows to increase yields by 20-50% and more, while using 90% less seed, 30-50% less water and 30-100% less agro-chemicals[24]. Based on agronomic practices, the goal is to create healthier and stronger plants with deeper root systems. These plants have proven to better withstand weather

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Yao et al. 2012. Agronomic performance of high-yielding rice variety grown under alternate wetting and drying irrigation. *Field Crops Research*, 126: 16-22.

[22] Von Ort and Zwart, 2017

[23] - IPCC, 2014. The IPCC's Fifth Assessment Report, Cambridge UK and New York, USA
- Jalloh et al, 2012. West African Agriculture and Climate Change, IFPRI, Washington DC
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- Van Ort and Zwart, 2018. Impacts of climate change on rice production in African causes of simulated yield changes. Glob. Change Biol. 24: 1029-1045.

[24] SRI International Network and Resources Center website, http://sri.cals.cornell.edu/; accessed April 17, 2021

calamities such as drought, floods and strong winds, and have shown to be less susceptible to pest and disease attacks. In respect to water productivity [25], SRI is the most efficient agronomic method with 0.43-1.02 kg of paddy rice produced/m^3 water used, compared to the alternate wetting and drying irrigation method alone, resulting in 0.39 – 0.54 kg/ m^3, and to flooded rice with 0.25-0.44 kg/ m^3 respectively. With the SRI method, soils are improved through regular organic matter additions, such as compost, animal manure, green manures or crop residues. Organic matter enriched soils hold more carbon, nutrients and water. They can nurture a larger soil biodiversity, which supports nutrient and water uptake by the plants and can protect plants from certain diseases. Fertilizer use efficiency is improved, and similar fertilizing benefits can be expected with 30-50% less fertilizer use. SRI management contributes to mitigation objectives by decreasing the emissions of greenhouse gases (GHG) when continuous flooding of paddy soils is stopped, and other rice-growing practices are changed. This includes reduced methane (CH_4) emissions (by 22% to 64%), slight increase or decrease in nitrous oxide (N_2O) emissions, together resulting in a reduction in total global warming potential (GWP) (by 20-30%, and up to 73%).[26]

136. **Cost-effectiveness analysis:** As a new approach, CRRP will create substantial benefits (as just outlined) and will play a critical role in the rice systems' adaptation to climate change. The additional benefits from SLWM and IPM implementation can be added to the SRI benefits, and most likely they will create synergistic positive effects. When, where and how severe abiotic and biotic stresses - such as drought, floods, storm damage, stressful temperatures, and pests and diseases attacks – will occur during project implementation, is impossible to predict and foresee. The RICOWAS project will be in a very unique position to monitor the CRRP systems' performance in the different climate zones of West Africa, through yield comparison studies and economic evaluations between CRRP/SRI and conventional rice production. Taking all the described circumstances into account, the following cost-effectiveness analysis will concentrate on the System of Rice Intensification, based on results obtained from implementing SRI in West Africa. Additional benefits and externalities, which might be substantial, are at this stage not quantitatively included. the cost-effectiveness analysis will compare the two alternatives i) rice cultivation in West Africa without RICOWAS (called Conventional or CONV in the next sections) and ii) the scaling-up CRRP in West Africa with the RICOWAS project (called SRI). It is undertaken at two levels: a) the rice plot level or household level, and b) the national and regional level.

137. **A) Rice plot comparison analysis:** Production costs, return and benefit of the SRI method compared to conventional method at rice plot level are based on the detailed input costs and labor costs per hectare, paddy rice yield (kg/ha), revenue from the plot (yield x price) and the benefit from the plot (revenue – costs). Data was provided during the full proposal project preparation phase by the National Executing Entities. Results of analysis from the different countries are presented in table 13.

Table 13: Production costs, return and benefit of rice production when using the SRI method and when using the conventional method at the rice plot level.

	Paddy yield	Price paddy	Input cost	Labor cost	Total cost	Revenue (yield x price)	Benefit (revenue-cost)
	kg/ha	US$/kg	US$/ha	US$/ha	**US$/ha**	**US$/ha**	**US$/ha**
SRI Costing							
Benin	6,000	0.27	582	482	**1,064**	**1,642**	**578**
Burkina Faso	7,500	0.32	572	395	**967**	**2,395**	**1,428**
Côte d'Ivoire	7,000	0.29	558	365	**923**	**2,044**	**1,120**
Ghana	6,460	0.26	503	341	**844**	**1,674**	**829**
Guinea	5,500	0.40	989	600	**1,588**	**2,198**	**610**
Mali	7,000	0.31	394	589	**984**	**2,172**	**1,188**
Niger	6,500	0.33	155	511	**666**	**2,135**	**1,469**
Nigeria	5,000	0.42	303	682	**986**	**2,100**	**1,114**
Senegal	5,000	0.27	222	151	**373**	**1,369**	**996**
Sierra Leone	3,500	0.59	202	631	**833**	**2,054**	**1,221**
Togo	4,800	0.26	157	391	**548**	**1,226**	**678**
Average	**5,842**	**0.34**	**422**	**467**	**889**	**1,910**	**1,021**
Conventional Costing							
Benin	3,000	0.27	214	391	**605**	**821**	**216**
Burkina Faso	5,500	0.32	653	340	**993**	**1,756**	**763**
Côte d'Ivoire	4,000	0.29	150	349	**499**	**1,168**	**669**
Ghana	3,760	0.26	206	341	**547**	**974**	**427**
Guinea	2,500	0.40	272	400	**672**	**999**	**328**
Mali	5,000	0.31	542	523	**1,065**	**1,551**	**486**
Niger	5,000	0.33	347	493	**839**	**1,642**	**803**
Nigeria	4,000	0.42	350	471	**822**	**1,680**	**858**
Senegal	3,000	0.27	366	115	**481**	**821**	**340**
Sierra Leone	2,200	0.59	350	481	**831**	**1,291**	**460**
Togo	3,300	0.26	181	272	**453**	**843**	**391**
Average	**3,751**	**0.34**	**330**	**380**	**710**	**1,232**	**522**

138. The results presented stem from irrigated and rainfed lowland rice production systems in the different countries. Average rice yields with SRI were 5,842 kg/ha, and for conventional rice production it was 3,751 kg/ha, which indicates

[25] Styger, 2017. Alternate Wetting and Drying and the System of Rice Intensification for Sustainable Irrigated Rice Production. Water in Agriculture Innovation Series, The World Bank, Washington DC.

[26] - Choi et al. 2015. Effect of SRI on water use, NPS pollution discharge, and GHG emissions in Korean trials. Paddy & Water Env. 13: 205-213
- Vermeulen 2012. Climate Change and Food Systems. Ann Rev Env Res 37: 195-222.

a 56% yield increase with SRI, which is congruent with the SRI-WAAPP project findings[27]. The production costs are divided into input costs and labor costs. Input costs for SRI were lower in 6 countries and higher in 5 countries compared to conventional production. The higher input costs under SRI are due to the high cost of organic fertilizer in certain countries. All other inputs costs were significantly reduced with SRI. Farmers used 90% less seed, and only 50% of the chemical fertilizers in most countries compared to the conventional systems. Most often, farmers omitted the use of pesticides entirely with SRI. Thus, input costs were reduced with SRI by one-third (compared to conventional methods) in the countries where organic matter was more affordable and better available. Producing cost-efficient organic matter to be used as organic fertilization, will be a focus of the RICOWAS project. Labor costs were about 20% higher with SRI compared to conventional farming, which incurred for improved soil preparation (especially field levelling), transplanting and weeding where mechanical weeders were not available. In countries where mechanical weeders are used, labor cost was reduced. Nursery management, uprooting time and transporting of seedlings was also reduced with the SRI system. Time used for harvesting and threshing naturally increased with SRI based on higher yields.

139. **Total production costs** per hectare increased overall by 25% with SRI and was 889 USD/ha compared to 710 USD/ha with conventional methods, thus 179 USD/ha higher with SRI. Revenue of the production (paddy yield x paddy price/kg) across all countries was 1,910 USD/ha for SRI, whereas for the conventional plot it was 1,231 USD/ha, indicating a difference of 678 USD/ha. The benefit from rice production (revenue – total costs) is shown in table 14. With SRI, the benefit/ha amounted to 1,021 USD and therefore was almost double compared to conventional rice benefit, which was 522 USD/ha. This indicates that a farmer gains 499 USD per hectare in addition to what he/she earns when cultivating a conventional rice plot. Again, this is congruent with multiple cost-benefit analyses undertaken in West Africa and around the world by comparing the SRI income with conventional rice farming income. [28]

Table 14: Comparison of benefits (USD/ha) obtained by using the SRI method and the conventional method of growing rice.

	Benefit (revenue-cost) US$/ha	Benefit (revenue-cost) US$/ha	Additional benefit SRI compared to Conv US$/ha
	SRI	**Conventional**	**SRI - Conv**
Benin	578	216	**362**
Burkina Faso	1,428	763	**665**
Côte d'Ivoire	1,120	669	**452**
Ghana	829	427	**402**
Guinea	610	328	**282**
Mali	1,188	486	**702**
Niger	1,469	803	**666**
Nigeria	1,114	858	**256**
Senegal	996	340	**656**
Sierra Leone	1,221	460	**761**
Togo	678	391	**287**
Average all countries	**1,021**	**522**	**499**

140. The main conclusion from this analysis relates to the feasibility for farmers to undertake SRI, as the production costs are slightly higher with SRI. Although farmers in the region are on board with SRI, they might not always have the means to apply SRI on all of their land. To support the scaling-up of climate-resilient rice production and SRI, it is critical for farmers to access cost-saving techniques and labor-saving equipment, both of which will be a focus of RICOWAS. It will allow farmers to fully embrace SRI and with that increase their wealth from rice production.

[27] Styger and Traoré, 2018. 50,000 Farmers in 13 countries; Results from Scaling-up SRI in West Africa. CORAF, Dakar, Senegal.
[28] Global SRI research open-source database. https://www.zotero.org/groups/344232/sri_-_system_of_rice_intensification_research_network , accessed April 17, 2021.

141. **B) Additional benefits created when adopting SRI/CRRP at the national and regional level:** The calculations of additional benefits obtained with SRI/CRRP at the national and regional level are shown in table 15. These are based on the target number of beneficiaries (row 1) and hectares to be cultivated with CRRP methods (row 2) under the RICOWAS project. Although additional benefits/ha when using the SRI method compared to the conventional method were calculated at 499 USD/ha as seen in table 14, this number was reduced by 40% to 300 USD/ha for purpose of aggregation, and taking into account risks and uncertainties. Further assumptions were made that in the first year of project implementation 10% of target rice area of the final target area will be planted with CRRP (row 7), in the second year that will increase to 25% (row 6), in the third year to 70% (row 5) and eventually reach 100% in year four (row 4). As these benefits occur on an annual basis, these total additional benefits were added up for the four years of the project (row 8). The total additional benefits that farmers will earn from implementing CRRP will reach by the end of the project 43.8 million USD (row 8), or 352 USD/farmer beneficiary (row 9).

Table 15: Additional benefits (USD) achieved when using the CRRP method compared to the conventional method, for the 13 countries, and over the project period

Row number				Benin	BF	CDI	Gambia	Ghana	Guinea	Liberia	Mali	Niger	Nigeria	Senegal	SL	Togo	Total/Average
1		Number of farmers	Number	7,128	6,830	3,392	8,485	13,173	5,600	13,620	18,164	10,981	1,200	14,245	15,000	6,513	124,331
2		All rice systems, number of hectares (ha)	ha	7,061	2,142	3,199	2,122	10,176	2,200	2,741	9,403	3,241	15,000	6,213	3,000	4,742	71,240
3	Total additional benefits for 100% rice area with SRI compare to Conv =300 USD/ha (60% of 499 USD)* (Target surface area in number of ha x 300 USD/ha)		USD	2,118,300	642,600	959,700	636,600	3,052,800	660,000	822,300	2,820,900	972,300	4,500,000	1,863,900	900,000	1,422,600	21,372,000
	Project additional benefit accumulation over 4 years (with % of target area cultivated)																
4		Total Year 4 (100% of land cultivated)	USD	2,118,300	642,600	959,700	636,600	3,052,800	660,000	822,300	2,820,900	972,300	4,500,000	1,863,900	900,000	1,422,600	21,372,000
5		Total Year 3 (70% of land cultivated)	USD	1,482,810	449,820	671,790	445,620	2,136,960	462,000	575,610	1,974,630	680,610	3,150,000	1,304,730	630,000	995,820	14,960,400
6		Total Year 2 (25% of land cultivated)	USD	529,575	160,650	239,925	159,150	763,200	165,000	205,575	705,225	243,075	1,125,000	465,975	225,000	355,650	5,343,000
7		Total Year 1 (10% of land cultivated)	USD	211,830	64,260	95,970	63,660	305,280	66,000	82,230	282,090	97,230	450,000	186,390	90,000	142,260	2,137,200
8	Total additional benefits for farmers during RICOWAS project		USD	4,342,515	1,317,330	1,967,385	1,305,030	6,258,240	1,353,000	1,685,715	5,782,845	1,993,215	9,225,000	3,820,995	1,845,000	2,916,330	43,812,600
9	Total additional benefits USD for each farmer during entire RICOWAS project (total benefits/total number of farmers)		USD/farmer over 4 years	609	193	580	154	475	242	124	318	182	7,688	268	123	448	352

* Although additional benefits/ha using SRI compared to CONV were calculated at 499 USD/ha, for the purpose of aggregation of numbers, 60% of 499 USD was applied, thus 300 USD/ha.

C) Expected generated benefits by the project (Alternative 2) in comparison to no-project intervention (Alternative 1): An evaluation of expected generated benefits by the project (Alternative 2) was undertaken and compared with the absence of the project (Alternative 1). The results for each of the project outputs are presented in table 16.

Table 16: Comparison between benefits created by the project (Alternative 2) and no-project intervention (Alternative 1)

Project outputs	Cost US$	Benefits generated	Alternatives to project
COMPONENT 1: Strengthen human and institutional capacity in climate-resilient rice production (CRRP)			
Outcome 1.1. Climate change dimension in the regional Rice Offensive Strategy and the National Rice Development Strategies integrated			
Output 1.1.1. Climate change dimension and proposed actions integrated into the regional and national rice strategy documents	300,000	The project through the studies and policy dialogue will contribute to strengthening the knowledge on climate change impact in the ECOWAS region for the benefit of all stakeholders. Up to date, knowledge on climate change adaptation for rice production is still limited in the region. All the results will be available at national and regional levels.	The assessment is an important vehicle through which farmers, researchers, decision-makers and extension services are able to learn about climate change and how to adapt to it. Without this scientific basis, it will be difficult to convince the stakeholders to adopt and focus on new rice-growing methodologies that are based on SRI, SLWM and IPM
Outcome 1.2. Key stakeholders operating in different climate zones and rice systems gained tools, knowledge and skills to successfully address climate-threats &implement CRRP in a sustainable way			
Output 1.2.1. Capacity of national and regional research centers strengthened	322,000	The project will strengthen the capacity of 14 research institutions (13 national and 1 regional) support field-oriented research on climate adaption, and support the production of scientific papers. It is essential to undertake adapted and field-based research on CRRP practices, in order to provide clear and scientific guidance for their adoption.	Not undertaking research on CRRP practices will weaken their potential acceptance and dissemination. The methods might not be well understood and thus not given the credit and evaluation they might deserve.
Output 1.2.2. Institutional capacity of the regional and national executing entities for project implementation strengthened	461,500	The capacity strengthening of the 13 NEE and 1 REE are essential to enable them to ensure their role in the coordination of activities. This is especially important, as the project brings together researchers, extension service, producers, private sector and decision-makers.	Without this support, the NEE and REE will find it very difficult to efficiently coordinate the project activities and be inclusive to all actors of rice value-chain.
Output 1.2.3. Extension institutions involved in the development and dissemination of SRI and CRRP strengthened	565,000	The project will work with research institutes, ministries and other stakeholders to develop a training curriculum. Extension service staff will receive in-depth training on CRRP and be equipped with training materials. They in turn will train around 124,331 in climate resilient rice production	Without the up-scaling of the SRI/CRRP approach, farmers will continue with inefficient, input-based and non-sustainable practices leading to soil degradation, water overuse, chemical pollution, resulting in a rice production system that is highly vulnerable to climate change, leading to yield decline, crop failure and a decline in food security.
COMPONENT 2. Assist farmers to scale-up Climate-Resilient Rice Production CRRP			
Outcome 2.1. Smallholder rice farmers in the project zones successfully adopted SRI and CRRP practices, achieved higher rice productivity, and improved their incomes and livelihoods.			
Output 2.1.1. Smallholder rice farmers in the project zones strengthened their livelihoods by reducing production costs and improving rice yields through the adoption of SRI and CRRP	6,383,000	The project will support 124,331 farmers across the region in training and technical assistance to implement CRRP practices on 56,740 ha that creates on average an additional income of income of 282 USD per ha and farmer over the 4 years of project (total of approximately 35.1 million dollars of additional income to farmers)	Without changing towards CRRP practices, farmers will continue to experience yield fluctuations and continuous yield reductions, while having insufficient capacity to adapt to climate change threats and calamities, which will lead to reduced food security and increased poverty.
Output 2.1.2. SRI and CRRP practices - adopted by smallholders in the project zones - monitored, analyzed and the results widely shared	815,000	A well thought out monitoring and evaluation system will support the project life cycle, institutionalize a culture of accountability, and promote good governance and management, all of which can inform and provide support to other programs in the countries and region to implement results-oriented CRRP actions.	Without a robust M&E system, the project will neither be able to document field results and lessons learned, nor adjust training modules for rice producers. This relates not only for internal use but also for public dissemination of findings and information. The project would not be able to respond to the information needs of OSS, the Adaptation Fund, and the governments in relation to the implementation of project activities, outputs, outcomes and impact of the project.
Outcome 2.2. Rice value chain strengthened through public-private partnerships (PPP) and agricultural associations and cooperatives, and thus improved the resilience of smallholder rice farmers to the harmful effects of climate change			
Output 2.2.1. Rice production and post-harvest components in the rice value-chain strengthened	1,035,000	The project will facilitate the establishments of PPP, which will remain active beyond the project's life cycle and which will continuously create added value for all parties as time goes on.	If the current situation prevails, rice farmers would not have the opportunity to benefit from economic activities along the rice value chain activities and thus not be

			able to increase their income significantly and with that improve their livelihoods.
Output 2.2.2. Agricultural associations and cooperatives in the rice value chain strengthened in their operations	887,500	The project will increase the capacity of producer organizations to become active in the economic value-chain operations, especially in post-harvesting processing and marketing of the rice they produced.	Without better organization and improved capacity, farmer organizations will have difficulties to successfully implement new business models of post-harvest processing and marketing. They will also have difficulties to access credits and financing, thus are not able to diversity their income streams and improve their livelihoods.
COMPONENT 3. Strengthen communication, advocacy and partnerships to scale-up CRRP			
Outcome 3.1. Awareness and knowledge of CRRP in West Africa greatly increased			
Output 3.1.1. Knowledge and awareness materials developed and widely disseminated, in response to the demand and needs of different stakeholder groups	515,000	Sharing information and knowledge gained on CRRP will allow the wide range of stakeholders to embrace, promote and drive the scaling-up of CRRP, and thus contribute significantly to the goals stated in the national and regional rice policies.	If knowledge is not shared, viable climate adaptation strategies and practices will not be known to stakeholders. Behavioral change in rice cultivation is not happening and rice systems remain highly vulnerable to climate change impact
Outcome 3.2. Partnerships and coordination strengthened to enable the mainstreaming of CRRP in West Africa.			
Output 3.2.1. Synergies among partners established to mainstream CRRP in West Africa	515,000	Creating an effective coalition of partners will guarantee that CRRP will be mainstreamed and scaled-up beyond the project's lifetime.	Interventions remain fragmented, limited to short-term gains and do not gain momentum to effectively contribute to climate-adaptation solutions
Total	11 799,000		

142. **Financial analysis:** Financial analysis for the cost-effectiveness of the project is shown in table 17. The financial profitability of the project investment is determined by reviewing the cost components of the project and by estimating the financial benefits obtained through project interventions based on the following financial appraisal techniques: i) cash flow ii) benefits cost ratio, iii) net present value (NPV), and iv) internal rate of return (IRR).

Table 17: Financial analysis for the cost-effectiveness of the project

	Year 1	Year 2	Year 3	Year 4	Total
A. Cost components					
Component 1	$ 469 000,00	$ 587 500,00	$ 417 000,00	$ 175 000,00	$ 1 648 500,00
Component 2	$ 2 180 750,00	$ 2 348 250,00	$ 2 504 750,00	$ 2 086 750,00	$ 9 120 500,00
Component 3	$ 297 000,00	$ 285 000,00	$ 224 000,00	$ 224 000,00	$ 1 030 000,00
Execution costs (management units)	$ 280 226,25	$ 280 226,25	$ 280 226,25	$ 280 226,25	$ 1 120 905,00
Implementation costs (management unit)	$ 270 023,75	$ 270 023,75	$ 270 023,75	$ 270 023,75	$ 1 080 095,00
Total costs (A)	$ 3 497 000,00	$ 3 771 000,00	$ 3 696 000,00	$ 3 036 000,00	$ 14 000 000,00
B. Financial benefits					
Benefits from studies/consultancies	300 000	250 000	100 000	50 000	700 000
Benefits to trainers and extension services	400 000	600 000	200 000	194 000	1 394 000
Benefits to rice production farmers	2 339 003	5 924 800	15 799 465	19 749 332	43 812 600
Benefits to researchers	30 000	75 000	150 000	100 000	355 000
Benefits to the producer associations/groups	200 000	375 000	600 000	1 000 000	2 175 000
Total financial benefits (B)	3 269 003	7 224 800	16 849 465	21 093 332	48 436 600
Cash flow (B-A)	-227 997	3 453 800	13 153 465	18 057 332	34 436 600
Benefit Cost Ratio (B/A)	0,9	1,9	4,6	6,9	3,5
Net Present Value (NPV)					8 382 069
Internal Rate of Return (IRR)					30,49

143. The financial analysis indicates a positive benefit-cost ratio of 3.5. The NPV is positive with 8.38 million dollars and the internal rate of return is also positive with 30.49%. An important aspect to consider is that the additional benefits from implementing CRRP will continue into the future to occur on an annual basis. The proposed project is therefore cost-effective and worth the investment.

E. Consistency with development strategies

144. The proposed project will contribute to achieving the respective national adaptation priorities. For all the thirteen selected countries, rice self-sufficiency is a priority for food security. Consequently, the project is in alignment with national or sub-national sustainable agriculture development strategies, development plans, poverty reduction strategies, and national adaptation programs of action. It is also consistent with national socio-economic priorities, national climate change priorities, and national food security priorities.

Table 18: Development strategy and project consistency for 13 RICOWAS countries

Country	Policy/Strategy/Plan	Purpose
Regional	ECOWAP/CAADP Process 2025	The overall objective of the 2025 Strategic Policy Framework is to "contribute in a sustainable way to meeting the food and nutritional needs of the population, economic and social development and poverty reduction in the Member States, and inequalities between territories, zones and countries". RICOWAS will contribute to the four specific objectives.
	Regional offensive for a sustainable rice production in West Africa	ECOWAS initiated a regional offensive to reach rice self-sufficiency by 2025. The Regional Offensive for sustainable and sustained recovery of rice production in West Africa Program was approved by the ECOWAS Council of Ministers in June 2014 and aims to reduce imports to zero by 2025.
	Regional Agriculture Investment Plan And Food Security and Nutrition (RAIPFNS)	The RAIPFNS aims to 1) contribute to increasing agro-forestry-pastoral and fisheries productivity and production through diversified and sustainable production systems, and to reducing post-production losses; 2) Promote contractual, inclusive and competitive agricultural and food value chains oriented towards regional and international demand, with a view to the regional market integration; 3) Improve access to food, nutrition and resilience for the vulnerable populations; and 4) Improve the business environment, governance and funding mechanisms of the agricultural and food sector.
Benin	Nation Rice Development Strategy (SNDR)	The overall objective is to increase rice production from 72,960 tons of paddy in 2007 to 385,000 tons of white rice per year at least from 2015. This will involve: (i) adopting rice varieties adapted to local conditions, (ii) facilitate access to good quality inputs, (iii) support producers for the development of rice sites, (iv) create post-production conditions downstream of production crops required to ensure a greater presence in our markets of better-quality local rice.
	National Plan for Agricultural Investments and Food and Nutrition Security (PNIASAN, 2017 – 2021)	PNIASAN is a second-generation National Agricultural Investment Plan. It is defined as the strategic planning and coordination framework for the sector of sustainable agriculture and food and nutrition security. The rice sector is one of the sectors that should benefit from massive investments.
	NDC	Regarding adaptation measures, the objectives in the agriculture sector are, among others the diversification and promotion of high value-added agricultural sectors, as well as the modernization of resilient agricultural infrastructure in the context of climate change for food and nutritional security.
	NAPA	The NAPA aims at enabling the development of a framework for the coordination and implementation of activities to adapt to climate change in the country, capacity building and the synergy of the various programs in the field of the environment through a participatory, community and multidisciplinary approach. Within the framework of agriculture, the program envisages the improvement of food crop production systems, especially rice.
Burkina Faso	Nation Rice Development Strategy (SNDR II) 2020-2030	The SNDR II aims to: consolidate the achievements under SNDR I, achieve self-sufficiency, generate security stocks and surpluses for export as well as increase the incomes of the stockholders due to a competitive and sustainable production.
	Country Resilience Priorities (PRP) 2016-2020.	The specific objective is to structurally and sustainably reduce the food and nutritional vulnerability of 50% of the poor and very poor, or 5,500,000 vulnerable people in Burkina Faso (around 700,000 households).
	NDC	Regarding the adaptation actions under AFOLU sectors, it is planned, among other things, to develop and promote 1,000 ha per year of land by using the System of Rice Intensification (SRI)
	National Adaptation Plan (NAP)	In terms of adaptation options under the agriculture sector, the NAP promotes, among other things, the adoption of productivity systems (intensification of production systems).
Côte d'Ivoire	National Agricultural Investment Program (PNIA II, 2017-2025).	The PNIA II has three strategic objectives: the development of agro-sylvo-pastoral and fishery added value; strengthening agro-sylvo-pastoral and fishery production systems that respect the environment; and inclusive growth, which guarantees rural development and the well-being of populations.
	NDC	NDC aims at reducing GHG emissions by 28% compared to emissions for the target year (2030) in a basic scenario (Business As Usual or BAU).
	National Climate Change Program (PNCC) 2014	By prioritizing the resilience of the Ivorian population, the PNCC intends to implement concrete and coherent actions to limit the social, economic and environmental impacts caused by climate change.
	National Rice Development Strategy	The vision of the strategy is to meet all the national consumption needs for good quality and competitive rice compared to imported rice, with the opportunity to build up a safety stock and export the surplus production.
Gambia (The)	INDC	Under the Agriculture sector, two conditional mitigation options (NERICA Rice production and Rice efficiency) have been assessed and reported on in this INDC (see Figure 4 to the right). For production of NERICA upland production in place of Swamp Rice, estimated

		emission reductions are 124.1 GgCO2e in 2020, 397.7 GgCO2e in 2025 and 2030. For the promotion of efficiency in rice production, estimated emission reductions are 437.8 GgCO2e in 2020, 707.0 GgCO2e in 2025 and 2030.
	National Rice Development Strategy (NRDS)	The overall goal of the NRDS purpose is to enhance the enabling environment for systematic exploitation of the vast natural resource potentials, mitigation of the priority constraints in the resource base, provision of production-oriented technologies suitable for broad-based participation and adoption by the majority of rice farmers for efficient rice production
	Agriculture And Natural Resources (ANR) policy (2009 – 2015)	The ANR main objectives include improved and sustainable measurable levels of food and nutrition security in the country in general and vulnerable populations in particular.
	Gambia National Adaptation Programme of Action (NAPA) on Climate Change 2007.	NAPA provide a process for Least Developed Countries (LDCs) to identify priority activities that respond to their urgent and immediate needs to adapt to climate change – those for which further delay would increase vulnerability and/or costs at a later stage.
Ghana	National Rice Development Strategy (NRDS)	The strategy aimed at addressing the challenges of low agriculture production, by focusing on some of the bottlenecks along the rice value chain which hitherto has inhibited the growth of the rice industry.
	Coordinated Programme of Economic and Social Development Policies (2017-2024).	Under this program, agricultural development will be ensured of efficient production and post-harvest management. Productivity will be increased in agriculture, livestock and fisheries sectors. For agro-processing, state support will be given for the cultivation of selected agricultural products such as tomato, cassava, cocoa, soya beans, maize, oil palm, cashew, cotton, shea nut, selected fruits, groundnuts, and rice.
	INDC	Ghana's emission reduction goal is to unconditionally lower its GHG emissions by 15 percent relative to a business-as-usual (BAU) scenario emission of 73.95 MtCO2e2 by 2030. The INDC outlines adaptation policy actions including agriculture resilience building in climate-vulnerable landscapes.
	National Seed Policy 2013	The main objective of this Policy is to support the development and establishment of a well-coordinated, comprehensive and sustainable private sector-driven seed industry through systematic and strategic approaches which would continuously create and supply new improved varieties for use by farmers and, further, support successful seed production, certification, marketing, and seed security systems which will form the basis for food security and support the overall development of the agricultural sector.
	National Climate Change Adaptation Strategy.	The main goal of the National Climate Change Adaptation Strategy is to increase Ghana's resilience to climate change impacts and reduce vulnerability in key sectors, ecosystems, districts, and regions of the country. Agricultural productivity will be increased with the transition to climate-smart agriculture, application of farming technologies and capacity building of local farmers on climate change.
Guinea	National Rice Development Strategy	The overall objective of this strategy, on the one hand, is to ensure the country's self-sufficiency in rice in the medium term; and on the other hand, to export to markets at the sub-regional and international level in the long term.
	National Action Plan for Adaptation to Climate Change (NAPA)	The purpose of the NAPA is to define the priority activities to be implemented to meet the immediate needs and urgent concerns of socio-economic groups to ensure their adaptation to the harmful effects of climate change. Within the framework productive and sustainable agriculture, NAPA included among other things, activities for the development of irrigated rice farming in Middle and Upper Guinea.
	National Agricultural Development Policy	The general objective of this policy is to increase the contribution of the agricultural sector to food security, nutrition and poverty reduction for the Guinean populations.
	Accelerated Program, Food and Nutritional Security and Sustainable Agricultural Development (PASANDAD)	PASANDAD's overall objective is to accelerate the fight against poverty and its implications in terms of availability and access to healthy food, including by the most vulnerable sections of society.
Liberia	Liberia Agriculture Sector Investment Plan II	LASIP identifies priority areas from which investment projects aligning national objectives. The program will be a public-private partnership (PPP) in which investment growth for the export sectors will be spearheaded by the private sector, while the public sector will concentrate on the promotion of small farmer growth and development.
	National Policy and Response Strategy on Climate Change of the Republic of Liberia	The strengthening of national institutions, communities, and initiatives so that they have a strong capacity for adaptation, disaster risk reduction and mitigation, which can contribute to increased resilience and achievement of national development agenda and sustainable development goals of Liberia.

	Liberia National Rice Development Strategy (LNRDS)	The LNRDS aspires to improve productivity in smallholder rice farms through a value chain approach in which the needs and issues of various subsectors will be addressed through an integrated approach.
	Pro Poor Agenda for Development and Prosperity 2018 to 2023 (PAPD)	The PAPD is the second in the series of National Development Plans anticipated under the Liberia Vision 2030 framework. It follows the Agenda for Transformation 2012-2017 (AfT). It draws heavily on the implementation experience of the AfT and incorporates lessons from the implementation of the Interim Poverty Reduction Strategy 2007 as well as the Poverty Reduction Strategy (2008-2011).
	NDC	Vulnerability and adaptation assessments conducted have revealed that Liberia is faced with climate change and variability leading to extreme events, which harm agriculture, forestry, health, energy, and other sectors.
Mali	National Rice Development Strategy (SNDR II) 2016-2025	The overall objective of the SNDR is to contribute to food security in rice and to raise Mali to the rank of emerging countries exporting quality rice.
	NDC	Regarding the mitigation measures for GHG emissions, the most appropriate concern three agricultural sectors which are irrigated rice, fertilizer management, and livestock farming. For the irrigated rice sub-sector, mitigation will focus on water management through intermittent irrigation to avoid permanent flooding of rice fields, a source of emission by fermentation.
	Agricultural development policy (PDA)	The overall objective is to contribute to making Mali, an emerging country where agricultural sector is an engine of growth of the national economy and guarantor of food sovereignty in a sustainable development logic.
	NAPA	The general objective of NAPA is to contribute to the mitigation of the harmful effects of climate variability and change on the most vulnerable populations with a view to sustainable development. To achieve this objective, the program envisages among other things the extension of improved varieties adapted to the climatic conditions of the main food crops (millet, sorghum corn, and rice).
Niger	National Rice Development Strategy 2009	The overall objective of the rice strategy is to contribute to poverty reduction and the fight against food insecurity. The strategy aims also to increase the income of rice farmers and stockholders, who contribute to the rice added value and to satisfy consumption.
	3N Initiative « les Nigériens Nourrissent les Nigériens »2012	The overall objective is to protect sustainably the Nigerian population from hunger and malnutrition and guarantee them the conditions for full participation in national production and the improvement of their incomes.
	Sustainable Development and Inclusive Growth Strategy (SDDCI) 2035	The strategy aims, among other aspects, to reduce rural poverty through the modernization of the rural world.
	National Climate Change Policy (PNCC).	The overall objective of the PNCC is to contribute to the sustainable development of the country by reducing the negative impacts of climate change.
Nigeria	National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CCN)	The overall objective is to take action to adapt to climate change by reducing vulnerability to climate change impacts and increasing the resilience and sustainable wellbeing of all Nigerians; and to reduce or minimize risks by improving adaptive capacity, leveraging new opportunities, and facilitating collaboration inside Nigeria and with the global community.
	National Agricultural Investment Plan (NAIP)	Its main objective is enhancing total factor productivity in the agricultural sector through the application and diffusion of knowledge and improvement in the technology base.
	Nation Rice Development Strategy	The main objective is to increase rice production in Nigeria from 3.4 million tonnes paddy in 2007 to 12.85 million tonnes by the year 2018
	Rice Transformation Agenda- Action Plan (RTA-AP)	The National Rice Development Strategy (NRDS) was transformed into the RTA-AP for alignment with the government rice policy. The RTA-AP aims at ''Achieving rice self-sufficiency, import-substitution, and food security'' from 2019 to 2030.
	Agricultural Policy for Nigeria.	The national agricultural policy emphasizes self-sufficiency in food production including rice. Policy review target at rice production addresses the pertinent problem of rice production, quality processing, marketing, distribution, domestic and export market in a holistic and integrated manner. In line with the policy framework of market liberalization, the Federal Government of Nigeria would seek to foster Public-Private-Partnership.
Senegal	National Rice Self-Sufficiency Program (PNAR)	The objective is to strengthen the promotion and development of the local rice sector by increasing the area; modernization of the means and methods of production and processing; and the professionalization of actors to improve food security and thus contribute to the fight against poverty.

	National Agricultural Investment Program for Food Security and Nutrition (PNIASAN, 2018-2022)	PNIASAN aims at contributing sustainably to Senegal's economic development, poverty reduction, and improvement of food security and nutrition of the Senegalese populations.
	NDC	In the rice sub-sector, the document planned to make a conditional water saving of 40% in water compared to traditional rice through the SRI.
	Senegalese Agriculture Cadence Acceleration Program (PRACAS)	The Program aims to achieve food and nutrition security and the development of agricultural exports within very short deadlines while building competitive, diversified and sustainable agriculture. Specifically, it targets self-sufficiency in rice and onions; optimizing the performance of the groundnut sector; and the development of off-season fruit and vegetable sectors.
Sierra Leone	Smallholder Commercialization Program - Investment Plan	This sectoral program main goal is to reduce rural poverty and household food insecurity on a sustainable basis and to strengthen the national economy. The program, among others, contains objectives relating to food security.
	National Sustainable Agriculture Development Plan (NSADP) 2010-2030	The NSADP is a multi-sectoral instrument with the aim to provide short, medium and long-term investment programs in the agriculture sector. The overall objective is to ensure economic growth and increased revenues to households, firms and the state so that basic services (health, education, etc.) will be provided to the population.
	Comprehensive Africa Agriculture Development Programme (CAADP)	The overall objective of the CAADP is to increase the agriculture sector's contribution to the national economy. The CAADP include a major investment sub-programmes targeting rice commercialization.
	National adaptation programmes of action (NAPA) 2007	The NAPA will serve as simplified and direct channels of communication for information relating to the urgent and immediate adaptation needs of Sierra Leone caused by climate change and extreme weather events. Increasing rice production is one of the priority actions presented in the document.
	National Rice Development Strategy	The goal of the NRDS is to lay out a framework for significant increases in rice production to contribute to the improvement of food security and economic development in Sierra Leone.
Togo	National Climate Change Adaptation Plan (PNACC), 2018.	PNACC aims at contributing to inclusive and sustainable growth in Togo through the reduction of vulnerabilities, the strengthening of adaptive capacities and the increase of resilience to climate change.
	Nation Rice Development Strategy (SNDR) 2010	The SNDR aims to increase the areas of rice production; improve yields, increase rice production, based on the following four major sectors: seeds, fertilizers, best technologies, post-harvest, and marketing.
	NDC	Togo, within the framework of adaptation measures, intends to contribute to the fight against climate change, strengthen the resilience of production systems and means by embarking on a low-carbon development trajectory.
	National Development Plan (PND) 2018-2022	The overall objective of the PND is to structurally transform the economy, for strong, sustainable, resilient, inclusive growth, creating decent jobs for all and inducing the improvement of social well-being.

F. Alignment with national technical standards

145. The project is in compliance with the Environmental and Social Policy (ESP) of the Adaptation Fund, and congruent with national environment and social regulations of all of the 13 countries. Limited adverse impacts of the project could arise from activities in Component 2, which concern improvements to field sites. The proposed project activities have been discussed and validated by the national and regional executing entities during the consultation workshops as described in PART II.I, ensuring that they comply with the relevant technical standards in each country as well as the ones from ECOWAS. The project will mainly focus on strengthening the capacities of extension agents and farmers on CRRP that involves the sustainable management of land and water, the promotion of organic fertilizers and the development of small plots for people with limited access to land. To this end, the technical standards applicable to irrigation systems, land tenure, seed production and selection, production and use of organic fertilizers, have been reviewed to ensure their inclusion in the training modules and materials to be developed. The following paragraphs below identify the relevant national and regional laws and regulations of the concerned countries regarding agriculture, land, water and soil resources, as well as with the environment and social standards.

146. **Pesticides:** The project intends to avoid the use of pesticides. To do so, the project will follow the Pesticide, Plant Pest, Sanitary, and Phyto-sanitary Standards (SPS) approved in May 2008 under Regulation C/REG.3/05/2008. The provisions of this regional regulation will be applied to the activities identified under Output 2.1.1 and Output 2.1.2.

147. **Fertilizers:** One the pillars of the CRRP approach is to promote the use of organic fertilizers, and to reduce and avoid the use of chemical ones. To this end, the project will follow the Regulation C/REG.13/12/12 relating to fertilizer quality control in the ECOWAS region (adopted in Dec 2012). This Regulation provides a detailed set of procedures for the

functioning of domestic and regional fertilizer markets based on truth in labelling and harmonized quality control standards. The regulations also set out detailed procedures for fertilizer sampling and physical and chemical analysis based on AOAC, ISO and/or EU standards together with specific tolerance limits for bag weight, nutrient content shortages, and maximum allowable heavy metal limits.

148. **Seeds:** ECOWAS Countries have approved in May 2008 Regulation C/REG.4/05/2008 on Harmonization of the Rules Governing Quality Control, Certification and Marketing of Plant Seeds and Seedlings in the Region. The Regulation covers eleven major crops that are important to food security including rice. The West Africa Seed Committee had been created in June 2012 to implement regulations on seed quality control, certification and marketing. The provisions of these laws and regulations will be applied in the activities identified under Output 2.1.1 and Output 2.1.2.

149. **Environmental and social aspects:** The project will be implemented on thousands of sites spread across the ECOWAS region. Despite this large geographic coverage, the site selection criteria applied by the countries took into account, among other things: the fragility of the ecosystem, the presence of protected areas, national or international interest areas. The protection of ecosystems and their biological diversity is an essential objective of the project, and training modules will build awareness on the danger of expanding farms into wetland (especially mangroves), wetland removal and the degradation of the riverbanks. The table below summarizes the environmental and social policies and regulations that have been assessed in each country to ensure that they are considered in the training modules.

Table 19: Relevant technical standards that can be applied for environmental and social aspects

Country	Relevant standards
Benin	• Law No. 98-030 of February 12, 1999 on the Framework Law on the Environment in the Republic of Benin • Decree No. 2001-2035 of 12 July 2001 on the organization of environmental impact assessment procedure
Burkina Faso	• Law No. 006-2013/AN on the Environment Code of Burkina Faso • Decree No. 2001-342/PRES/PM/MEE1 of 17 July 2001 on procedures of Environmental Impact Assessments and Environmental Impact Statements
Côte d'Ivoire	• Framework Law No. 96-766 on the Environment Code • Decree No. 013-41 dated 30 January 2013 relating to the strategic environmental assessment of policies, plans and programs
The Gambia	• Act No. 13 of 1994 on National Environment Management • Environmental Impact Assessment Regulations, 2014
Ghana	• Environmental Assessment Regulations 1999
Guinea	• Order No. 045\PRG\87 on the Code for the protection and enhancement of the environment • Decree No. 199/PRG/SGG/89 codifying environmental impact studies • Order A/2013/474/MEEF/CAB/SGG of March 11, 2013, adopting the general guide for environmental assessment
Liberia	• Environment Protection and Management Law • Regulation on Environmental Impact Assessment (FDA Regulation 113-08)
Mali	• Decree No. 09-318-P-RM of June 26, 2009 relating to the Environmental and Social Impact Study • Decree No. 2018-0992 / P-RM of December 31, 2018 setting the rules and procedures for the strategic environmental assessment • Decree No. 2018-0991/P-RM of December 31, 2018 relating to the study and the environmental and social impact statement
Niger	• Law No. 98-56 of 29 December 1998 framework law for the management of the environment
Nigeria	• Act No. 25 of 2007 on National Environmental Standards and Regulations Enforcement Agency (Establishment) • The EIA Act, Cap E12 LFN 2004
Senegal	• Law No. 2001-01 on the Environment Code • Decree No. 2001-282 implementing the Environmental Code
Sierra Leone	• Act No. 11 of 2008 on Environment Protection Agency • EIA Guidelines for the agricultural Development
Togo	• Law No. 2008-005 30 May 2008 on framework law on the environment • Decree No. 2017-040/PR laying down the procedure for environmental and social impact assessments

150. **Land tenure:** Lack of land ownership of certain categories of people (women, young, elderly, displaced people, refugees, etc.) and limited access have been identified as a potential risk that could lead to the exclusion of those who do not own land or have the right to own land because of local rules or national regulations. The table below describes the national regulations that will be followed in each country to ensure that even people with limited access to land may benefit from the project.

Table 20: Relevant technical standards that can be applied to land issues

Country	Relevant standards
Benin	• Law No. 2013-01 of August 14, 2013 relating to the land and state code in the Republic of Benin • Decree No. 2015-014 dated 29 January 2015 relating to the conditions and methods for the development of rural land
Burkina Faso	• Law No. 034-2012/AN on Agrarian and Land Reorganization
Côte d'Ivoire	• Law n ° 98-750 of 23 December 1998 relating to the Rural Land
The Gambia	• Land Use Regulations, 1995 (L.N. No. 11 of 1995).
Ghana	• Act 107 of 1962 on Farm Lands (Protection)
Guinea	• Law L-99-013 / AN establishing the Land and State Code in the Republic of Guinea
Liberia	• The Land Administration Policy, 2015
Mali	• Law N ° 2017- 001 / OF April 2017 on Agricultural Land
Niger	• Ordinance n ° 93-015 fixing the guiding principles of the Rural Code
Nigeria	• Land Use Law
Senegal	• Law n ° 2011-07 of March 30, 2011 on the land ownership regime
Sierra Leone	• National Land Policy for Sierra Leone, 2015 • Local Government Act, No. 1 of 2004- Section 20
Togo	• Law n ° 2018-005 on the land and state code

151. **Water and soil management:** CRRP is an agro-ecological and climate-smart agriculture approach that promotes land and soil conservation by reducing the use of irrigation water up to 50%, and that supports soil aeration, which stimulates root growth of the rice plants. This will be reflected in the training modules. The table describes the relevant regulations to adapt the training modules in each national context.

Table 21: Relevant technical standards that can be applied to water and soil management

Country	Relevant standards
Benin	• Decree No. 2011-573 of August 31, 2011 establishing the master plan for water development and management
Burkina Faso	• Law No. 002/2001/AN on the orientation law relating to water management
Côte d'Ivoire	• Law No. 98-755 on the Water Code
The Gambia	• Land Use Regulations, 1995 (L.N. No. 11 of 1995).
Ghana	• Water Use Regulations, 2001 (L.I. 1692)
Guinea	• Law N°L/94/ 005/CTRN of 15 February 1994
Liberia	• Water Supply and Sanitation Policy, 2009
Mali	• Law No. 02-006 on the Water Code
Niger	• Order No. 2010-09 of 1 April 2010 Water Code in Niger
Nigeria	• Water Resources Act • Water Sector Law
Senegal	• Law No. 81-13 on the Water Code
Sierra Leone	• Water and Sanitation Policy
Togo	• Law No. 2010-004 on the water code

152. **Agriculture equipment development and quality and safety -** The project will promote simple, low-cost equipment, both for production (weeders, markers, seeders, trans-planters), and for post-harvest processing (thresher, dehuller), which do not require special licenses of permits to operate. Heavy equipment such as tractors or combine-harvesters are excluded in the project. As a scaling-up project, RICOWAS will mostly disseminate already tested equipment. The introduction of equipment protected by intellectual property rights is excluded. The national entities in most countries that oversee compliance and safety assurance of equipment are the governmental research and development institutes, which in many instances are also the NEE of the RICOWAS project (see table below)

Table 22: Safety standards compliance assurance

Country	Relevant standards
Benin	• Beninese Center for Scientific and Technical Research (CBRST) • National Institute of Agricultural Research of Benin (INRAB) • ANM - National Agency for Standardization
Burkina Faso	• Burkinabe Standardization Agency (ABNORM) • Institute of the Environment and Agricultural Research (INERA)
Côte d'Ivoire	• Côte d'Ivoire Standardization (CODINORM) • National Center for Agricultural Research (CNRA)
The Gambia	• The Gambia Standards Bureau (TGSB) • National Agricultural Research Institute(NARI)
Ghana	• Food, Agriculture, Chemistry and Material Standards Department • Ghana Standards Authority (GSA) • Council for Scientific and Industrial Research (CSIR)
Guinea	• Guinean Institute for Standardization and Metrology - (IGNM) • Guinea Agronomic Research Institute (IRAG)
Liberia	• Liberia Agriculture Commodity Regulatory Authority Act of 2014. • National Standards Lab • Central Agricultural Research Institute
Mali	• Malian Agency for Standardization and Promotion of Quality (AMANORM) • National Committee for Agricultural Research (CNRA) • National Center for Scientific and Technological Research (CNRST)
Niger	• Nigerien Agency for Standardization, Metrology and Certification • National Agricultural Research Institute of Niger (INRAN)
Nigeria	• Standard for Agricultural machines implements and equipment – NIS 318 & 320: 1997 • Agricultural Research Council of Nigeria
Senegal	• Senegalese Association for Standardization (ASN) • Senegalese Institute for Agricultural Research (ISRA)
Sierra Leone	• Sierra Leone Standards Bureau • Sierra Leone Agricultural Research Institute
Togo	• Togolese Standardization Agency (ATN) • Togolese Institute of Agronomic Research

G. Project duplication

153. The RICOWAS project is highly unique. It is the largest and only the third regional project for SRI ever implemented. The first was the SRI-WAAPP project, which ran from 2014-2016. The second was project with four countries in the Mekong region of South East Asia. Although the RICOWAS project will implement a new approach, Climate-Resilient Rice Production (CRRP), it will build on approaches and strategies pioneered by SRI-WAAPP, particularly by proactively seeking synergies, fostering cooperation, encouraging complementarities, and by avoiding duplications between and within country initiatives.

154. After the SRI-WAAPP project ended, SRI activities continued in Benin, Burkina Faso, Côte d'Ivoire, the Gambia, Liberia, Niger, Nigeria and Togo, where the larger WAAPP program was still active. To date, the leading multi-lateral donors for SRI in the region have been the International Fund for Agricultural Development (IFAD), the World Bank, and the Food and Agriculture Organization of the United Nations (FAO). Bi-lateral supporters include the German Corporation for International Cooperation (GIZ), Federal Ministry for Economic Cooperation and Development of Germany (BMZ), United States Agency for International Development (USAID), and Luxembourg Agency for Development Cooperation (LuxDev). Multi-country rice initiatives currently underway in the region include the Green Innovation Centers (GIC), funded by GIZ; the Competitive African Rice Initiative (CARI), supported by BMZ and the Bill and Melinda Gates Foundation; and the Coalition for African Rice Development (CARD), launched by NEPAD, the Alliance for a Green Revolution in Africa (AGRA), and Japan International Cooperation Agency (JICA). Although the GICs actively integrate the SRI method in their activities, CARD and CARI do not. In Mali, GIZ supported the development of first National Program for Scaling-up SRI in Africa. In regards to research, the West and Central African Council for Agricultural Research and Development (CORAF/WECARD) has played a prominent role to support research and disseminate the SRI methodology in the region, most importantly through the WAAPP. Although the international research organization AfricaRice has not focused on studying SRI, it is the national research institutions, which have taken the lead on SRI research. Scientific journal articles on these SRI studies (most of them in association with the SRI-WAAPP project) were published from Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali, Niger, Nigeria, Sierra Leone and Togo. As seen in multiple activities across the region, there are many international NGOs, which have acquired expertise in SRI implementation, including Africare, Care, CRS, World Vision, Welthungerhilfe, and the Red Cross. The Regional Consultation Framework of Rice Producers Organizations of West Africa /The Network of Farmer and Producer Organizations in West Africa (CRCOPR/ROPPA) has taken a leading role in the dissemination of SRI for the past 10 years. With support from LuxDev, they organized a regional workshop in 2018 with their national

representatives from 13 ECOWAS countries on the scaling up of SRI. They recommended to seek funding for a regional SRI project, which in 2021 is being further developed. RICOWAS offers therefore an important opportunity to build on the recommendations and work with the committed stakeholders associated with CRCOPR/ROPPA and develop complementarities and synergies with their activities and avoid any duplication. The secretariat of CRCOPR/ROPPA is also a good candidate to become a member of the regional steering committee (see organogram under institutional arrangements in Part III).

155. A major opportunity for synergistic implementation between RICOWAS and other regional initiatives exists with the West Africa Food System Resilience Program (FSRP), currently in 2021 in full project development phase under leadership of ECOWAS and to be submitted to the World Bank/IDA. It is a 10-year program for 17 countries, including all member countries of ECOWAS and the Permanent Interstate Committee for Drought Control in the Sahel (CILSS). The FSPR objectives are to strengthen regional food system risk management, improve the sustainability of the productive base in targeted areas, and develop regional agricultural markets. The project has three components: i) digital advisory services for agriculture and food crisis (led by CILSS/AGRHYMET), ii) prevention and management, sustainability and adaptive capacity of the food systems productive base (led by CORAF/WECARD), and iii) market integration and trade (led by ECOWAS and the West African Economic and Monetary Union (UEMOA)). RICOWAS' regional implementing entity (OSS) and regional executing entity (CRoS-RICE) have both participated in the program's consultative meetings, including a four-day stakeholders video-workshop titled "Under the Palaver Tree: Unpacking Food System Resilience in West Africa" from July 6 –9, 2020. Both will continue to be part of the follow-up consultative process. Additionally, RICOWAS has already been registered to be an implementation partner of FSRP. The existing fruitful partnership between CRoS-RICE and the two SRI programs at Cornell University (Climate-Resilient Farming Systems Program and SRI-Rice) with their large worldwide SRI network will be strengthened with a focus on CRRP. Under the regional facilitation of CORAF/WECARD, other important synergistic opportunities reside in the area of research, development and integration with Good Agricultural Practices (GAP) as developed by partner research institutions, including the National Agricultural Research Systems (NARS), the global research partnership CGIAR (formerly known as Consultative Group for International Agricultural Research) with its centers Africa Rice Center (AfricaRice), the International Rice Research Instituted (IRRI), and its Research Program Climate Change, Agriculture and Food Security (CCAFS), in addition to other international research institutions, such as the French Agricultural Research Centre for International Development (CIRAD-France), Hebei Academy of Agriculture and Forestry Sciences (HAAFS-China), the Brazilian Agricultural Research Corporation (EMBRAPA-Brazil), and the Feed-the-Future Innovations Labs (USA).

156. At the national level, there are many projects and programs that specifically target the scaling-up of SRI: Fonds Compétitif pour l'Innovation Agricole Durable (FCIAD) in Côte d'Ivoire, the National Program to scale-up SRI in Mali, and the Agricultural Development Project in Matam (PRODAM) in Senegal. In most countries, SRI activities are integrated into agricultural and rice development programs implemented by governments, sponsored projects, or by civil society organizations such as NGOs and farmer organizations. As SRI has been known in most countries in the region for the past 10 years, there are many technical staff and farmers trained in previous projects, but who are not currently associated with any SRI initiative. There are many projects, organizations, and stakeholders that have obtained some expertise or are currently involved in SRI activities, but they are often scattered and dissociated. It will be a top priority for RICOWAS to identify all human and institutional capacity in each of the countries, and to mobilize this capacity for the project. However, since the end of the SRI-WAAPP project, none of the current initiatives is focusing on the regional and bioclimatic specificities of the West African countries for the SRI-CRRP approach and the rice value chain development. RICOWAS, unlike the other projects, is aiming to support the integration of the climate-change thematic into the regional and national policy plans. During the proposal preparation process for RICOWAS, an inventory of all current and planned rice projects and initiatives was prepared by then NEE of the 13 countries, which included the identification of the project objectives for each of the projects. The NEE also proposed mechanisms to foster partnerships and synergies between RICOWAS and these projects. The following table highlights a few of the most important on-going and planned projects operating in the rice sector in the 13 countries. RICOWAS will establish partnerships and collaboration agreements in the effort to create synergies in the scaling-up of CRRP.

Table 23: On-going and planned rice sector projects in the 13 countries of the RICOWAS project

Name of project	Project Period	Financial Partner	SRI yes/ no	Focus of the project	Collaboration and synergies with RICOWAS
Benin					
Projet d'Appui à la Production Vivrière et au renforcement de la Résilience dans les Départements de l'Alibori, du Borgou et des Collines (PAPVIRE-ABC)	2016-2021	Global Agriculture and Food Security Program (GAFSP)/ African Development Bank (ADB)	no	Improve agriculture productivity, adaptation to climate change, sustainable land and water management, poverty reduction, agriculture infrastructure	Sign an agreement for technical assistance to reinforce project in the implementation of CRRP
Projet d'Amélioration de la Productivité Agricoles des Petits Exploitants (PAPAPE)	2014-2025	Islamic Development Bank (IDB)	no	Improve agriculture productivity, market access, income generating activities for smallholder farmers, sustainable land and water management	Sign an agreement for technical assistance to reinforce project in the implementation of CRRP
Projet d'Appui à la Diversification Agricole et Accès au Marché	2019-2024	IFAD	no	Food security, nutrition, gender and youth focus	Sign an agreement for technical assistance to reinforce project in the implementation of CRRP
Burkina Faso					
Projet de résilience et compétitivité agricoles du Burkina Faso (PReCA)	2020-2025	World Bank/ IDA	no	Focus on irrigated production systems, improve productivity of rice and other crops	Integrate capacity strengthening events to project staff and farmers in CRRP
Projet d'aménagement et de valorisation de la plaine de la Léraba (PAVAL)	2019-2024	ADB, FAD, IFAD	no	Improve crop productivity and income for smallholder, especially women rice farmers.	Integrate capacity strengthening events to introduce and train farmers in CRRP
Projet d'Appui AUX Filières Agricoles dans les régions du sud-ouest, des Hauts-Bassins, des Cascades et de la Boucle du Mouhoun (PAFA-4R)	2020-2025	IFAD	no	Food security improvement, income generation for smallholder rice farmers through improved production and post-harvest processing.	Integrate capacity strengthening events to introduce and train farmers in CRRP
Côte d'Ivoire					
Projet de diffusion du système de riziculture intensive, une pratique culturale innovante pour l'amélioration du riz en Côte d'Ivoire	2019 - 2021	FCIAD /FIRCA	yes	SRI project present in some of the RICOWAS project zone area, focus on improving SRI practices, demonstration plots.	Align with this project and contribute to capacity strengthening, exchange visits and harmonize training and learning approaches
Gambia					
Resilience of Organizations for Transformative Smallholder Agriculture Project (ROOTS)	2021-2026	IFAD and others	no	ROOTS continues to strengthen success from previous project called NEMA, focus on rice value chain development, women and youth.	Important project that can benefit from RICOWAS on CRRP capacity strengthening
Rice Value Chain Transformation Project (RVCTP)	2020-2025	AfDB	no	Rice seed multiplication and dissemination, increase rice yield and production, improve value-chain and involvement with private sector	Project can benefit from RICOWAS CRRP capacity strengthening trainings, field visits etc.
Regional Rice Value Chain Development Project (RRVCDP)	2020-2025	ISDB	no	tidal irrigation land development; improve market access and strengthening of rice value chain	Project can benefit from RICOWAS CRRP capacity strengthening trainings, field visits etc.
Ghana					
Ghana National Adaptation Fund Project	2020-2222	GCF	no	Integrate climate change aspects into national development plans, decision-making and effective adaptation in the country.	Partner with this project for advocacy and policy-support.
Increased Resilience to Climate Change in Northern Ghana through The Management of Water Resources and Diversification of Livelihoods	2016-2020	AF	no	Adoption of Good Agricultural Practices that take into account sustainable land and water management and adaptation to climate change. RICOWAS to continue working with the farmers.	RICOWAS to continue working with the farmers from this project and reinforce their capacity in CRRP.
Guinea					

AgfriFarm	2019-2024	FIDA, OFID, BADEA	no	Improve rice production, including climate change adaptation, capacity strengthening of value chain stakeholders	Active collaboration with RICOWAS to adopt SRI and CRRP practices in the respective project zones and rice systems.
SARITEM	2019-2024	AFD	no	Improve rice production, including climate change adaptation, capacity strengthening of value chain stakeholders	Active collaboration with RICOWAS to adopt SRI and CRRP practices in the respective project zones and rice systems.
PDAIG	2018-2022	World Bank (WB)	no	Improve rice production, including climate change adaptation, capacity strengthening of value chain stakeholders	Active collaboration with RICOWAS to adopt SRI and CRRP practices in the respective project zones and rice systems.
Liberia					
Smallholder Transformational Agriculture Revitalization Project (STAR-P)	2020-2024	WB	no	Rice value chain development and rice production intensification	Active collaboration with RICOWAS to adopt SRI and CRRP practices in the respective project zones and rice systems.
Integrated Rice-Fish Farming Project	2020-2022	EU (AfricaRice and WorldFish)	no	Rice value chain development and rice production intensification	Active collaboration with RICOWAS to adopt SRI and CRRP practices in the respective project zones and rice systems.
Improving Rice Production for Smallholders Project (LIBRICE)	March 2021 to February 2025	Government of Japan	yes	Doubling rice yields and enhance value chain	Active collaboration with RICOWAS to adopt SRI and CRRP practices in the respective project zones and rice systems.
Mali					
SRI Project through CEP/EEA	2019 - unknown	Coopération allemande	yes	Implementation of SRI - activities, increase rice production, adaptation to climate change, RICOWAS to harmonize approach for scaling-up of SRI and CRRP, work in value-chain to improve parboiling and other value-additions	RICOWAS project will collaborate with many other partners who are part of the National scaling-up program on SRI, harmonize extension and training approaches, organize learning events, and strengthen capacity of all stakeholders.
Capacity strengthening in scaling-up efforts of SRI	2018-2020	CIV/GIZ	yes	Improve rice productivity, improve marketing and income for smallholder farmers, sustainable land and water management, climate change adaptation	RICOWAS project will collaborate with many other partners who are part of the National scaling-up program on SRI, harmonize extension and training approaches, organize learning events, and strengthen capacity of all stakeholders.
Niger					
Chaine de valeur	2020	BID	no	Rice seed production	Project under preparation, SRI and CRRP can be pillars for rice seed production, RICOWAS to offer training and TA
PAIRED	2019	CORAF/WECARD	no	Rice seed production	Project under preparation, SRI and CRRP can be pillars for rice seed production, RICOWAS to offer training and TA
FUCOPRI/ROPPA	2021	SOS FAIM LUXAMBOURG	yes	Project preparation for an SRI project	ROPPA is planning a regional SRI project, very close collaboration with RICOWAS indicated
Nigeria					
GIZ-CARI	2015 - 2021 (Planning for renewal)	GIZ	yes	focus on rice yield increase, sustainable soil and water management, including organic fertilization,	Large rice project with some SRI experience. Technical awareness and knowledge can be reinforced with RICOWAS partnership
Agricultural Extension Activity	2020 - 2025	USAID	yes	Sustainable soil and water management, agricultural mechanization, implementing good agriculture practices	Large rice project with some SRI experience. Technical awareness and knowledge can be reinforced with RICOWAS partnership
Senegal					
PROVALE CV	2019-2024	BAD/AGTF (ANCAR)	yes	Focus on improving rice productivity through the application of the System of Rice Intensification (SRI),	Close technical partnership with RICOWAS to be established.

PADAER II	2018-2024	FIDA (ANCAR, SODEFITEX/Bamtaaré)	yes	Focus on improving rice productivity through the application of the System of Rice Intensification (SRI),	Close technical partnership with RICOWAS to be established.
PAPSEN/PAIS	not identified	Italian Cooperation (ISRA)	yes	Focus on improving rice productivity through the application of the System of Rice Intensification (SRI),	Close technical partnership with RICOWAS to be established.
Sierra Leone					
Sierra Leone Regional Rice Value Chain Development Project	2021-2030	Islamic Development Bank. BADEA, SL Gov.	no	Increase rice productivity, Income, reduce poverty and improve livelihoods. Create commercial opportunities rice farmers	RICOWAS to reinforce climate adaptation strategy, technical training on SRI
SRI Project ENGIM International	2018	Italian cooperation	yes	SRI project, introducing SRI to farmers in Port Loko district	RICOWAS strengthen capacity of SRI farmers and others who are interested in SRI
Togo					
Projet d'aménagement des terres agricoles de la préfecture de l'Oti (PATA-OTI)	2017-2024	* Banque Arabe pour le développement Economique en Afrique (BADEA); Banque Ouest Africaine de Développement (BOAD)	no	Food security improvement, agriculture infrastructure, agriculture equipment, support farmer cooperatives, rice productivity improved.	RICOWAS to propose close collaboration to strengthen this project's rice activity
Projet du champ à l'assiette	Août 2019 - Juillet 2022	ELEVAGE SANS FRONTIERE Cofinancé par CFSI	yes	Integrating livestock management and SRI, improved sustainability of farming system, improve rice productivity and increase income.	RICOWAS implementing partners are already involved in this project, thus can strengthen capacity of these farmers with RICOWAS technical assistance and trainings and learn from the stakeholders of this project about constraints and innovations.
Projet de développement rural de la plaine de Djagblé (PDRD)	2019-2021	Banque Arabe pour le Développement Economique en Afrique (BADEA)	yes	Rice productivity improvement project, value-chain improvement, irrigation infrastructure.	NEE is an implementing partner, and can liaise between both project for synergies and reinforcement

157. In addition, the responsibilities of the 13 national executing entities will go beyond the implementation of project activities related to capacity strengthening and field-based activities but include coordination of all SRI- and CRRP-related activities in each of their countries. A dialogue with CRRP stakeholders will be sought to create synergies and complementarities in order to optimize the limited resources available to address the challenges of climate change and rice production. Moreover, the second outcome of project component three (Outcome 3.2) ensures the strengthening of coordination and partnerships to mainstream CRRP in West Africa. As the scaling-up process of CRRP advances, it can be expected that the number of stakeholders and the complexity of institutional engagement will increase. It will be important to be able to track all initiatives and to partner with CRRP stakeholders. To this effect, the regional and national executing entities will actively network and meet with policy-makers, donors, development and research initiative leaders (as identified above), support partners' coalition building, develop national networks, and organize annual national and regional meetings.

158. The national networks will be open to any interested stakeholder who wish to participate, be it representatives of farmer organizations, NGOs, the private sector, other rice development or research programs, program developers and donors, or government institutions. Annual meetings at the national and regional levels will include reporting on achievements and the sharing of planned activities. This will facilitate the coordination of activities, avoid duplication, and strengthen synergies. The project will also seek constructive collaborations to implement national and regional development and climate action plans, such as the National and Regional Rice Development Strategies and National Determined Contributions. RICOWAS is designed to facilitate partnerships that create synergies, avoid duplication, and enable the scaling-up process.

159. In summary, four mechanisms will be incorporated in the institutional arrangements (see Part III) to specifically avoid duplications, promote synergies and complementarities among different initiatives related to CRRP. They are:

160. **At the national level:** The Annual National Workshop will adopt the RICOWAS Annual Work Program & Budget (AWPB). Representatives from partner organizations, projects and initiatives related to CRRP will be invited to the workshop and together with RICOWAS stakeholders evaluate executed activities and create a complementary plan for the following year.

161. A financial and technical partner's (FTP) alliance supporting CRRP scaling up (CRRP/FTPA) will be established and facilitated by the national facilitators of the national executing entity. This will be a supportive mechanism for dialogue and coordination between the FTPs in favor of CRRP, and will be responsive and adapted to each country's realities.
162. **At the regional level:** The Annual Regional Workshop to adopt the RICOWAS Annual Regional Work Program & Budget (ARWPB) will regroup the national facilitators, OSS, RCoS-Rice and Cornell University, including a few invited regional key actors (such as CRCOPR/ROPPA, a few NGOs and private sector, AfricaRice) to evaluate and plan activities to complement other initiatives and create synergies. A consolidated and consensual ARWPB will be prepared for submission to the Regional Steering Committee (RSC).
163. The RSC, which will be composed of policy decision-making representatives from RICOWAS countries (Directors of NEE) and key partners (such as ROPPA, ECOWAS, CILSS, UEMOA, CORAF/WECARD, private sector umbrella organization), will be the authority to adopt the ARWPB. Members will be invited to the Annual Regional Workshop to assist in making sure duplications are avoided and synergies strengthened.

H. Learning and knowledge management

164. Effective communication, knowledge management and learning are vital to successfully scale-up CRRP in West Africa. This important task has been integrated into the project design and is reflected throughout the project implementation approaches and activities.
165. The technical approach (see Part I) will be based on guiding agronomic principles that can be adapted to practices at the local level. All project stakeholders in the region will obtain the same understanding of CRRP while having the opportunity to identify solutions and best practices for local conditions. These local practices will be systematically tracked with a harmonized data collection system and qualitatively evaluated by farmers. Data can be easily aggregated, analyzed and shared at the national, climate zone, or regional level. This iterative and participatory approach will allow farmers who live in different countries but work in the same climate zone and with the same rice system to learn from successful experiences elsewhere. Project training and capacity-strengthening will be based on a modular approach, under which the number of modules can be expanded and revised according to need as the project progresses. A specific combination of knowledge modules can be offered, and modules can be adjusted by trainers to fit local conditions. All this will favor efficient information exchange, experiential learning, knowledge creation and analysis, and dissemination and uptake of new knowledge. The list of proposed trainings is presented in table 24.

Table 24 : Proposed trainings and capacity strengthening events for the RICOWAS project

Topics of trainings	Objectives	Type, methods, number of trainings	Project time period	People to be trained
System of Rice Intensification (SRI)	- Create in-depth and harmonized understanding of SRI across the region - Teach methodology to adapt principles and develop location specific best practices - Teach tracking methods for innovations	- 4 regional trainings of trainers (theory and field practice) - at least 3 national training of trainers (theory and 3-day field practice) - Multiple local trainings (3-day practice and theory) - Field visits, open farm days	1st Year: in-depth SRI training and tracking methods 2nd Year: refresher SRI training, focus on local adaptation development and tracking	- ToT for Ministries and extension staff, researchers, NGO staff, farmers' association staff, SRI champions and SRI lead farmers. - Rice farmer trainings (men, women, youth)
Participatory innovation development	- Obtain in-depth understanding of using participatory methods in CRRP innovation development as implemented with farmers in their fields	- At least 2+2 national trainings in-class - 2 regional trainings in-class	1st Year: In-depth introduction, and methodology sharing 2nd year: refresher training and adjusted modules to local needs	-ToT for Ministries, extension staff, and researchers
Improved soil management	- Teach principles of good soil management - Identify and teach good soil management practices for each climate zone and rice system	- At least 48 national trainings in-class combined with field visits and hands-on training - Field visits and hands-on trainings	1st year: Introduction 2nd year: In-depth training 3rd year: adapted modules adjusted to local needs	- ToT for Ministries and extension staff, researchers, NGO staff, farmers' association staff, SRI champions and SRI lead farmers. - Rice farmer trainings (men, women, youth)
Improved water management	- Teach principles of good water management - Identify and teach good practices for each climate zone and rice system	- At least 48 national trainings in-class combined with field visits and hands-on training - Field visits and hands-on trainings	1st year: Introduction 2nd year: In-depth training 3rd year: adapted modules adjusted to local needs	- ToT for Ministries and extension staff, researchers, NGO staff, farmers' association staff, SRI champions and SRI lead farmers. - Rice farmer trainings (men, women, youth)
Integrate pest and disease management (IPM)	- Teach principles of IPM for rice - Focus on specific pest and disease issues for each climate zone and rice system	- At least 48 national trainings in-class combined with field visits and hands-on training - Field visits and hands-on trainings	1st year: Introduction 2nd year: In-depth training 3rd year: adapted modules adjusted to local needs	- ToT for Ministries and extension staff, researchers, NGO staff, farmers' association staff, SRI champions and SRI lead farmers.

				- Rice farmer trainings (men, women, youth)
Climate-zone specific CRRP technologies and innovations (as identified through participatory process)	Modules to be identified based on needs and opportunities as they arise in first two years of project implementation	- 4 regional trainings of trainers (theory and field practice) - at least 3 national training of trainers (theory and 3-day field practice) - Field visits and hands-on trainings	3rd year: In-depth training with specific modules 4th year: In-depth training with modules to support sustainability of project activities	- ToT for Ministries and extension staff, researchers, NGO staff, farmers' association staff, SRI champions and SRI lead farmers. - Rice farmer trainings (men, women, youth)
Post-harvesting and processing of rice	Modules to be developed to support project beneficiaries and farmer associations in best practices of post-harvesting, Develop business plans	- At least 10 national trainings sessions to farmer associations/cooperatives	Provided on demand	Members of farmer associations (with focus on women and youth)
M&E data collection training	Implement M&E methodology in a decentralized manner	- 2 regional ToT trainings for NEE staff - 5 national trainings for data collectors	1st year: regional training on M&E system 1st year: national trainings for decentralized implementation of M&E system	- M&E officers of project associated with NEE - Extension, NGO and farmer association staff, SRI champions and farmers who collect data in the field
Research methodologies, and writing of scientific articles	Strengthen researchers' capacity in research methodologies and scientific writing	- Total of 8 quarterly-held online workshops - 1-2 workshops during annual regional project meetings	2nd and 3rd Year: workshops with researchers on research methodologies and scientific writing	Researchers that are part of the regional CRRP research network

166. The third component of the project is called: Strengthen communication, advocacy and partnerships to scale up CRRP. The main output under communication is: (3.1.1.) Knowledge and awareness materials developed and widely disseminated, in response to the demand and needs of different stakeholder groups. Multiple communication tools can be creatively used for two-way communication to optimize learning and knowledge exchange among the project stakeholders. They include a web-based platform, use of social media, publishing printed documents, use of radio, shooting videos, creating posters, organizing exchange visits, as well as personal outreach, including presentations. Use of mass media such as radio allows for a wide reach, and information can be broadcast in local languages. This is especially useful for farmers who have limited access to other information resources. Information and communication technologies (ICTs) have also the potential to reach farmers through text messaging, voice messaging or sharing of video clips, and allows farmers to reply. Although face-to-face meetings and exchange visits are irreplaceable for their quality and depth of exchange, the use of smartphones might become more important if travel is restricted due to the potential medium-term impact of the COVID-19 pandemic.

167. The project will produce multiple knowledge products: updates on project progress, farmer stories, technical fact sheets, posters and manuals, and background materials to explain and illustrate climate change issues as they affect the rice sector. The format of the shared information will be adjusted for the different audiences: farmers, policy makers and program developers, research and technical staff, and the public. Actively sharing knowledge gained from the project with policy decision-makers, donors, and program developers, will assure that project achievements and knowledge will be sustainably mainstreamed into future programs and initiatives.

I. Consultative process

168. The RICOWAS project is being built on the success recorded under the **ECOWAS SRI-WAAPP,** which was a "commissioned project", specifically requested by the 13 ECOWAS authorities, rice farmers, and other rice value chain actors. It ran for only 2.5 years but was highly successful, reaching 50,000 farmers. At the final project workshop, the development of a second phase to continue the scaling-up process was included among the specific recommendations and endorsed by all 13 countries leading to the formulation of this new proposal.

169. The RICOWAS project consultative process is an original, continuous and proactive bottom-up approach, in four phases: i) demand-driven process from the ECOWAS SRI-WAAPP World Bank-funded project (2014-2016) preceding application to the Adaptation Fund, ii) pre-concept note consultative process, iii) concept note consultative process, and iv) full proposal consultative process.

170. The project further through the consultative process took into account among other the **FPIC process** according to the AF ESP and the OSS E&S standards. This commenced and ran through during the development of the project despite difficulties with travel and meeting restrictions of Covid-19 pandemic encountered.

171. The main objective of the FPIC process is to ensure that all the beneficiaries are well sensitized about the project activities, impacts, proposed mitigation measures, the grievance mechanism and their inclusion in all activities to be undertaken. The purpose is to have exchanges which highlight the appropriate mitigation measures and alternatives in the project design to minimize impacts and appropriate compensation that will be determined with the full and effective participation -if any- of affected indigenous peoples, including indigenous women, youth, the elders and disabled people. These consultations were also important for preparing the Environmental and Social Management Plan (ESMP) which is also attached to this proposal.

172. The consultation process used several methodologies which included key informant interviews, focused group discussions and reconnaissance surveys. The main consultation outcomes and findings are presented in the specific reports which described the proceedings of the consultations and the discussions including list of participants and various stakeholders to the several meetings.

173. The free, prior and informed consent regarding certain activities at community level can only be obtained during the implementation of the project, given that the project is likely to encounter USPs. As such, the FPIC process, consultations and discussions with the communities will continue throughout the project, not only to inform and agree on the interventions, but equally for data collection on appropriate intervention application.

174. Thus, through this process, it was highlighted that the countries tend to consider their populations mainly marginalized and divided into ethnic groups and not indigenous per se. This is further extrapolated with review of the UN Convention on indigenous people[29].

175. **Pre-concept note preparation process:** Following the opportunity to apply for a regional project under the Adaptation Fund, a participatory process was adopted to obtain input from national and SRI-WAAPP project stakeholders from the 13 countries. Effective communication between SRI-WAAPP stakeholders and the National Designated Authorities (NDAs) for the Adaptation Fund, followed by a national consultation process, resulted in the endorsement of the pre-concept note by the NDAs from all 13 countries.

176. **Concept-note preparation process:** Once the pre-concept note was approved by the Adaptation Fund, the National Designated Authorities were asked to nominate a focal institution to serve as National Execution Entity in each of the 13 countries for the preparation of the project concept note. The focal institutions in turn designated a National Facilitator (NF) for the RICOWAS project to represent all rice stakeholders in their respective countries and to act as the national focal point for the project preparation process. 62% of the nominated NFs for RICOWAS had previously been the NFs under the SRI-WAAPP project, indicating a desirable continuity in the scaling-up process, even four years after the SRI-WAAPP project ended. In January 2020, the OSS project preparation team began a consultative process by informing the NFs about the project preparation procedures. This was followed by sharing two consecutive questionnaires and the draft log-frame with the NFs, requesting them to collect relevant information for the concept note development. It included identification of the project zones, constraints, vulnerabilities, strengths and opportunities as they relate to the rice sector impacted by climate change threats. It also addressed gender issues and the identification of the most vulnerable groups. A planned two-day workshop in West Africa had to be cancelled due to the COVID19 pandemic. Instead, all team members associated in the preparation of the project concept note agreed to participate in a video conference organized by OSS on April 14, 2020. Members discussed the concept note, making sure all concerns from the 13 countries were addressed, and validated it for submission to the Adaptation Fund. The main points shared by the country representatives are summarized as follows: participants welcomed the holistic approach taken by the project, addressing climate change threats to rice production by scaling up SRI and its associated best practices, known as CRRP. Representatives stressed the focus on scaling-up several times, as demand for assistance with SRI in the countries has been high, but has received insufficient support. They welcomed the value-chain approach, most importantly in regards to increased equipment availability for rice production and creating opportunities for post-harvest processing and marketing, especially involving youth and women. The gender approach was widely supported. Additionally, country representatives were greatly pleased that the project directly supports their national development strategies. They were in full agreement with the project concept and were looking forward to this regional collaboration. The report from this video conference was attached to the concept note submitted to the Adaptation Fund.

177. **Full proposal development process:** The process of interactive consultation conducted during the concept note phase continued with improvement, based on lessons learnt, and with the same spirit of collegial technical collaboration among project stakeholders and their representatives for the preparation of the proposal. Given the presence of multiple actors in the rice sector in the ECOWAS region, a multi-level consultation process was initiated under the guidance and supervision of a consultant contracted by the regional implementation entity (OSS).

178. **Project preparation and consultation at the national and local level:** Under the overall supervision of OSS, and via the OSS consultant, the national facilitators were tasked to lead the project preparation process at the country level. An agreement was signed between the national executing entities and OSS specifying the activities and modalities for the preparation process, which was implemented in three stages at the national level, and a fourth one at the regional level (see next paragraph). Multiple guidelines and templates were provided for all three national preparation stages, validated by OSS and administered by the consultant. This guaranteed a harmonized approach for the entire preparation process across all 13 countries.

179. The three national preparation stages were:

    i) **Document review and information gathering at the national level**: This included project zone description, vulnerability assessment, identification of the presence of indigenous groups and refugees in the project zones, assembling available data on cost-benefit analysis of SRI, stakeholder inventory and mapping, identifying needs and availability of equipment, tools and inputs for SRI rice production and rice processing, identifying ongoing and planned initiatives and projects similar to RICOWAS, specify gender roles in rice production and processing for each of the project roles, assessing environmental and social risks that could be associated with project

[29] https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf

implementation, review of the log-frame, propose a budget for project activities, and define institutional arrangement at the national level.

ii) **Consultation with rice-producing communities**: This was implemented through local meetings and via a consultation survey with representatives of beneficiaries in the project zones, which was administered through one-by-one meetings or small gatherings at the project implementation sites. Large local meetings were not possible nor encouraged due to the COVID-19 pandemic. A total of 728 stakeholders were interviewed from 75 different project sites as seen in table 25. The local language was used and specific attention to representation of vulnerable and minority groups was paid. The interactions focused on vulnerability assessment, constraints and potentials in rice production and capacity strengthening needs of the communities. The administered questionnaire included a section on the identification of producer groups and vulnerable groups. This allowed the NEE to identify the most influential producer groups who represent women, youth and vulnerable groups. During the national validation workshop (see next paragraph), representatives of these groups were invited to participate, their concerns and expectations were discussed and taken into account (see also last paragraph of this section). The NEE also completed an inventory of all ethnic groups present in the project zones, in order to identify potential indigenous groups residing in the project zones, based on which a special consultation process is indicated to be initiated. This inventory was shared with OSS to assist in this process. The results from the surveys and the inventories were summarized in national reports, which can be consulted through the following shared folder: Link

Table 25: Project zone stakeholders consulted and interviewed during the proposal development process

Country	People interviewed	Project zones visited	Women interviewed	Part of an association	know SRI
	Number	Number	%	yes/no in %	yes/no in %
Benin	4	4	0	50	100
Burkina Faso	61	6	31	98	90
Côte d'Ivoire	81	10	4	98	70
The Gambia	69	10	59	98	75
Ghana	54	3	33	93	90
Guinea	58	6	3	38	36
Liberia	30	4	52	71	71
Mali	51	4	29	71	94
Niger	40	4	13	23	75
Nigeria	88	5	17	77	65
Senegal	103	4	41	71	80
Sierra Leone	54	10	26	83	7
Togo	35	5	17	97	89
Total/Average	728	75	25	74	72

iii) **National workshops** for consultation and validation: The National Executing Entities organized national workshops after the first two steps were completed. Particular attention was paid to an inclusive, effective and gender-balanced participation of all stakeholder groups, including rice producer organizations, agricultural research institutions, agricultural advisory services, the private sector, local communities, communicators, general directorates of the ministries, multi-lateral and bi-lateral programs and projects, as well as relevant NGOs, policy makers, financial and technical partners. This intended process was not always possible to implement due to the restrictions imposed by COVID-19. The major results of these workshops were: i) validation of the project intervention sites, ii) validation of results from the community consultation surveys, iii) collection and discussion of concerns and needs from the project stakeholders, iv) confirmation and adjustment of the project stakeholder groups, v) discussion on effective inclusion of equity, gender and vulnerable groups into the project, vi) discussion of the potential impact of project activities on the environment and social structures at the project sites, vii) discussion and validation of the project's logframe, vii) validation of the institutional arrangements and viii) validation of the proposed project budget. National facilitators stayed in close contact with the OSS consultant, which assured a clear and common understanding of the preparation process and resulted in harmonized results across the region. A summary of the 13-country workshop reports can be accessed in Annex 6. An overview of workshop dates, location and participants is shown in the following table 26.

Table 26: National Project Preparation Validation Workshops

Country	Date	Location	# Participants	% Women
Benin	3/23/21	Cotonou	25	28%
Burkina Faso	3/23/21	Online	47	21%
Côte d'Ivoire	3/30/21	Abidjan	20	16%
The Gambia	3/26/21	Online	16	6%
Ghana	3/25/21	Nyankpala	40	25%
Guinea	3/24/21	Conakry	28	29%
Liberia	4/6/21	Monrovia	20	40%
Mali	3/25/21	Bamako	21	19%
Niger	3/24/21	Niamey	27	19%
Nigeria	3/30/21	Abuja+online	37+19= 56	27%
Senegal	3/24/21	Online	33	15%
Sierra Leone	4/14/21	Freetown	15	13%
Togo	4/2/21	Online	44	11%
Total participants			348	22%

180. **Project preparation and consultation at the regional level:** As a fourth step, a regional workshop was held with the presence of the national facilitators and representatives of the 13 national executing entities, the regional executing entity, representatives of the regional partner organization (CORAF/WECARD, CILSS, UEMOA, ECOWAS and AfricaRice), the project preparation consultant team as well as the OSS team. The results of the national consultation preparatory work were used to develop a first draft of the full proposal document, which was shared with the national and regional facilitators prior to the regional workshop. Analog to the concept note preparation phase a planned two-day workshop in West Africa had to be cancelled due to the COVID-19 pandemic. Instead, all project preparation team members met via a video conference organized by OSS and CRoS-Rice on April 15, 2021. After the various presentations and discussions, the participants validated the draft document including the agreed-upon amendments to be taken into account in the final proposal. The national facilitators and directors of the national executing entities expressed their appreciation and importance of the project. They were unanimously satisfied with the workshop and noted that their data and information shared were well taken into account in the drafted project proposal document, which they validated at the end of the workshop. The regional workshop report can be accessed in Annex 5.

181. **Approach to identifying beneficiaries and the different groups to be consulted:** The RICOWAS project, as mentioned above, is based on a previous initiative that has achieved positive results and has the unanimous support of the 13 countries in the region. It is on this basis that the consultation process was initiated, but this time taking into account the specificities and requirements of the AF in relation to equity and equal opportunities that the project must guarantee to all beneficiaries' communities. Indeed, this has not been very easy to conduct due to the COVID-19 pandemic experienced globally. In order to mitigate this, OSS developed a guide for the consultations and also took part in a number of remote meetings to emphasize the importance of considering the participation of different vulnerable and marginalized groups in the consultation process, which is essential for the project's success. At national and local levels, the main purpose of consultation sessions was to seek the beneficiaries' points of view and to collect information for a better design of the project with a focus on involving vulnerable groups, ethnic groups, minorities, rice farmers, women, youth, inter alia.

182. To this end OSS provided guidelines for the process which was adopted to cater to the needs of the beneficiaries using a top-bottom and bottom-up approach. The identification of the workshops attendees was based on specific criteria where the gender was highlighted as a major aspect for the process. OSS in collaboration with the EEs developed a selection criterion that was based on a questionnaire and aligned to the needs of the project as well as the AF principles. This was supported by the involvement of local leaders, community members, representatives of various institutional structures and the focal points among others to identify the affected beneficiaries. This process ensured transparency and inclusivity towards project design and finally execution. The IE and EEs will ensure that the consultative process of inclusion is adhered to and undertaken using the criteria to be updated on a rolling basis of the project implementation.

183. **Integration of consultation recommendations in final project design:** Concerns, suggestions and recommendations from the consultation process at local, national and regional level were identified (Annexe 7), and continuously integrated in the design of the project. Main recommendations and how they were addressed in the project design were: (i) focus on gender and youth: gender action plan, at least 30% of project beneficiaries; (ii) attract youth to participate in project: Activity 2.2.1.3., but also included in other activities; (iii) work closely with farmer organizations: Output 2.2.2 focuses on working and strengthening them; (iv) differentiate rice ecologies: in Activity 2.1.1.1 and 2.1.1.2. the project will promote best practices for each of the rice systems and climate zones; (v) focus on labor-saving equipment: this is a focus of the project, addressed in Activity 1.2.1.2., 2.1.1.5, 2.2.1.2, and 2.2.1.3.; (vi) actively support rice-value chain development: entire Outcome 2.2. is focused on it; (vii) undertake baseline study and set up well performing M&E system: Output 2.1.2 is focusing on this; (viii) create synergies with other rice projects: focus of outcome 3.2, fully taken into account as indicated in Part II, section G; (ix) conclusions of national and regional workshops to be taken into account: final adjustments on project sites, number of beneficiaries to the project document were made after the national and regional consultation workshops; and (x) concerns to implement project with limited budget: support to project coordination expanded through Activity 1.2.2.3.

J. Justification of funding request

184. The objectives of the project are fully in line with the food security thematic focal area of the Adaptation Fund. The measures, mechanisms, capacity building and public-private-partnership actions that will be developed and promoted within its framework will contribute to improve people's livelihood and contribute to food security.

Component 1: Strengthen human and institutional capacity in climate-resilient rice production CRRP (US$ 1,648,500)

185. Current regional and national rice development strategies need to be updated and strengthened by integrating the climate change dimension as a key element to ensure the achievement of their respective objectives under current conditions. The project intends to undertake an assessment of the impacts of climate change on rice production in West Africa. The main findings will be used to improve the regional and national agricultural and rice strategies by integrating the climate change dimension and indicating possible climate adaptation solutions. These updated documents will allow decision makers to consider and address climate change risks as they affect the rice value chain. The assessment will be widely disseminated at the regional and national levels. It will be used to develop technical guidelines for adaptation opportunities along the rice value-chain at the regional and the national levels. This component aims to improve the adaptive human and institutional capacity to implement SRI/CRRP practices in the different climate zones and rice systems of West Africa. This will be done by i) undertaking a capacity needs assessment ii) developing capacity strengthening plans for the regional, national and sub-national levels, iii) developing or updating capacity strengthening curriculum and tools adapted to local conditions within the countries, and iv) undertaking exchange visits and tours for cross-learning in areas with successful CRRP implemented techniques, including best soil and water management practices. The project will strengthen the human and institutional capacities of all rice sector stakeholders. Capacity strengthening will focus on (i) national and regional research centers, (ii) regional and national implementing entities for RICOWAS, and (iii) extension institutions involved in CRRP training and dissemination. A regional hub for communication, information sharing, and dissemination of technical information will allow the project to reach a maximum number of rice stakeholders in the region.

Component 2: Assist farmers to scale-up CRRP (US$9,120,500)

186. This component is intended to improve the adaptive capacities of smallholder rice farmers in the project area by sustainably increasing rice yields, facilitating access to other economic activities of the rice-value chain, and by improving their incomes. To this end, (i) SRI and SLWM best practices (as identified for each climate zone and rice system) will directly be scaled-up in farmers' fields, by providing direct technical assistance to farmers, by sharing high-quality knowledge on biological processes and practices with farmers, by encouraging participatory development of locally adapted practices with farmers and experience exchange among farmers, and by providing access to tools and equipment that support the adoption of SRI and SLWM; (ii) SLWM practices field implementation will focus on soil conservation and soil fertility restoration, increase soil water holding capacity through organic matter management and soil preparation methods, and channel and control water flows to the benefit of the rice crop and the larger landscape. All these activities have the purpose to increase the resilience of the rice crop to withstand climate events such as dry periods, flood events, heat waves, strong winds and storms; (iii) Farmers' implementing capacity for seed and organic fertilizer production will be strengthened, so that they can produce their own high-quality rice seed, and produce organic fertilizers with available natural resources, for self-use or market. Both actions will reduce two important bottlenecks for CRRP adoption and with that strengthen the adaptation capacity of the farmers. In addition, the project will increase opportunities for farmers to participate in other economic activities of the rice value-chain. For this, the project will support the establishment of private-public-partnership (PPP) networks involving private sector companies and farmer associations and cooperatives. Farmers will be able to improve cost/benefit aspects of rice production (e.g. through equipment access) and to participate in value-added post-harvesting activities. This approach to strengthen the PPP and to integrate project activities along the value-chain will create new synergies of collaboration and ownership, which will contribute not only to the sustainability of the project results but also improve the profitability of the rice value chain.

Component 3: Strengthen communication, advocacy and partnerships to scale-up CRRP (US$ 1,030,000)

187. Rice production in West Africa is still marked by low yields, high input use, overexploitation of water resources and soil degradation, leaving it vulnerable to climate change, and leading to food insecurity and low incomes. Creating awareness and sharing solutions with a large number of stakeholders about successful SRI-CRRP performance of RICOWAS activities, will be a vital contribution to the scaling-up of CRRP. The project will establish and implement a communication strategy at the regional and national levels. Best practices for SRI-CRRP and lessons learned from field activities will be documented and widely disseminated through technical fact sheets, manuals, documented farmer stories via blogs or videos, and by creating policy briefs and background materials. Information and knowledge will be packaged in the most appropriate form, tailored for the different audiences. Communication channels most suitable for different stakeholder groups can include web-based platforms, print media, radio, video and cell phones. National and regional CRRP networks will be created or further strengthened. Annual meetings will be held for stakeholders to share results, learn from each other, and plan for the year ahead. These networks will be open to any interested stakeholders including farmers, representatives from advisory services, the private sector, research institutions, donors, and policy makers. New partnership development will create complementarities and synergies, avoid duplication of efforts and support the successful scaling-up of CRRP in West Africa.

K. Project sustainability

188. Commitment to sustainability will drive the implementation approach and activities of the project. As a CRRP scaling-up initiative at both national and regional levels, the project is designed to anchor and mainstream CRRP in policy, in knowledge and capacity, in increased partnerships and budgetary commitments, and in the development and implementation of CRRP best practices in the field. By the end of the project, it is expected that CRRP will be integrated into the multiple domains of sustainability.

189. **Environmental sustainability**: CRRP will lead to increased rice productivity and adaptation capacity, as rice cropping systems will be strengthened through improved soil and water management. Despite the predicted increase in weather and climate variability, healthy rice systems will be more likely to exhibit resilience and resist these impacts. When faced with extreme weather events, farmers will secure good rice production, which is critical to achieve food security and strengthen the sustainability of their livelihoods. CRRP will result in water-saving, with the opportunities to use gained water for household purposes, other crops or animal husbandry. Reduced use of agro-chemicals will help keep the environment and water safe from chemical pollution, and limit damaging impacts on human, animal, and environmental health. The greater returns from implementing CRRP will pay back investments made by land users, communities or governments. Additionally, considerable secondary benefits from CRRP are expected to become an economic justification by itself.

190. **Social and economic sustainability**: Being able to secure crop yields in a time of climate change will have a substantial impact on livelihoods, enabling people to develop economic opportunities in their rural communities. The project will focus on creating new opportunities for the CRRP rice producers and link them with other economic opportunities along the value chain. Public-private partnerships will be initiated or strengthened so that farmers – especially women and youth - can engage and benefit from value-added activities. These activities include post-harvest activities such as threshing, milling, parboiling, packaging, and/or direct marketing their own rice, and therefore multiplying the return per kilogram of rice produced. Other PPP will be supported for the supply of organic fertilizers and rice seeds produced by smallholder farmers. Lessons can be learned from already successful initiatives, such as i) certified seed production using SRI in Nigeria and Guinea, ii) organic fertilizer production by Elephant Vert, Mali, iii) SRI equipment development by SOCAFON in Mali), and iv) a number of successful milling, parboiling and marketing operations with SRI rice in Benin, Burkina Faso, Côte d'Ivoire, Guinea, Ghana, Liberia, and Togo. Two major bottlenecks about higher production costs for SRI refer to the non-availability of i) organic matter as fertilizer, and of ii) labor-saving weeding equipment (see Annex 4 for production cost analysis in different countries). If farmers must buy organic fertilizer in areas where it is scarce and expensive, it increases the production costs for SRI considerably. Through the SLWM approach, the project will promote soil conservation methods that also produce organic matter on location and therefore eliminate the need for farmers to buy it. Making proven and simple weeder prototypes available addresses the second bottleneck of lowering production costs. This will be one of the priority actions of the project. The project will also train blacksmiths who can supply farmers with weeders and other equipment as needed beyond the project's time span. Both of these solutions integrate the sustainability aspect. The project will strengthen the capacity of producer organizations, which will enable them to access credits, enter into direct partnerships with the private sector, and become independent of project support. It allows for ownership of these business-related processes and leads to empowerment of the farming communities well beyond the life of the project.

191. **Institutional, policy-related and financial sustainability**: The project will be implemented through already existing national and regional organizations associated with the rice sector, including government, civil society, and private sector organizations. They will be encouraged and enabled through participatory and consultative processes to take on leadership and ownership of CRRP. The project is putting much emphasis on institutional capacity strengthening of national and regional research centers, regional and national executing entities and extension institutions (Outcome 1.2), which will ensure the necessary capacity for scaling-up CRRP is developed and implementation can continue after the project has ended.

192. Awareness-raising and information-sharing about climate adaptation solutions as pursued by the project will be conveyed to all stakeholder groups, including policy and decision-making institutions. Successful project results will be widely shared as part of the advocacy effort for CRRP by the project, targeting to mobilize political will as well as budgetary commitments for CRRP. A project database will be developed and hosted by CNS-Riz, to ensure that data and information in relation to SRI and CRRP remain available and freely accessible after the project has ended. RICOWAS will actively work with governments to integrate CRRP into national policies and development strategies (for example, Mali's National Program for the scaling-up of SRI), and to strengthen and mainstream CRRP in the Nationally Determined Contributions (NDC) implementation. The project will also connect with rice farmer umbrella organizations (such as the *Réseau des Organisations Paysannes et de Producteurs de l'Afrique de l'Ouest* or ROPPA) at the national and regional level to integrate CRRP in their strategies and work plans. Additionally, RICOWAS' national and regional leaders will harness donor and partner platforms to align their actions in the rice sector with CRRP activities in the region.

193. The scaling-up of CRRP will therefore not only allow improved food security and reduced poverty at the household and community level but also at the national level. With the broad coverage of project zones in the region (see project zone map in Part 1), it is predicted that CRRP will take a permanent foothold in those zones and be further disseminated by the rice value chain stakeholders and through community-driven efforts.

L. Environmental and social impacts and risks

194. The project as planned aims to strengthen the resilience of vulnerable populations to the adverse effects of climate change. The project does not involve the conversion of natural habitats to other uses and, in fact, the approach promoted by the project, improve soil fertility, reduce erosion and depletion of soil nutrients. Through the CRRP, the project will enhance biodiversity as a means to improve the resilience of rice system to climate change and climate variability. Despite the positive impacts that can improve the project results (Cf. II.C), limited potential negative impacts may be generated. The entire project activities were screened for any E&S risks according to the 15 principles outlined in the AF's ESP.

195. Based on the risk screening exercise, Components 1 and 3, are mainly focused on studies, revision and development of new policies, capacity building, communication and advocacy which are categorized as less risky (Category C). Under component 2 in general, the concrete adaption activities will be conducted on the field, thus are categorized as medium risk (Category B). The project activities are designed to induce less possibility of producing negative social and environmental impacts. Therefore, the overall risk ranking for this project has been categorized as **Category B**.

196. Thus, the E&S principles of the AF that will be triggered by the project in terms of negative impacts and environmental and social risks are presented in the table below:

Table 27 : Overview of the E&S Impacts and Risks identified as being relevant to the project

Principle 1: Compliance with the law. Screening result: **No risk**

Checklist of environmental and social principles	No additional assessment is required for conformity	Potential impacts and risks - additional assessment and management required for the conformity
Compliance with the Law	**X** *All issues relating to compliance with the law have been checked in Part II, Section E and are described extensively their*	
Access and Equity		**X** *It Is planned to explain explicitly, transparently and unambiguous during the launching process the project targeting and scaling up mechanism translated into the local languages so that everybody will be carried along. In addition, OSS in accordance with its practices and adherence to the AF, makes available to all direct and indirect beneficiaries of the project a grievance redress mechanism that will inform conflict situations and will ensure access and equity to all project participants and beneficiaries*
Marginalized and Vulnerable Groups		**X** *There is some risk in terms of access and equity for women, widows, youth, refugees, internal displaced people and people living with disabilities measures are required.*
Human Rights	**X** *The IE and its partners affirm the fundamental human rights of all people. The project does not risk violating any pillar of human rights.*	
Gender Equity and Women's Empowerment		**X** *Women are less likely to have the ownership of the land they till and have less land tenure security than men. Gender Assessment and Action Plan has been developed with a special focus on women and youth groups especially for capacity building, leadership in rice producer organization to ensure that they fully participate and benefit from the project.*
Core Labour Rights		**X** *Follow-up will be ensured by the EEs to comply with* the *international labour standards including children labour.*
Indigenous Peoples	**X** *In project intervention areas, no indigenous people or tribes were noted and will be affected by the project activities.*	
Involuntary Resettlement	**X** *The project will work with communities in their locations and on voluntary basis. Therefore, no resettlements or even displacement to new locations is expected. The project benefits will occur at the individual plot.*	
Protection of Natural Habitats	**X** *The project will be implemented in existing farming lands and will have no harm on natural habitats*	
Conservation of	**X**	

Biological Diversity	*The defined interventions will not affect the biological diversity. It is mainly about agricultural practices*	
Climate Change	**X** *The proposed CRRP will have a co-benefit on carbon sequestration with optimal use of water for rice production*	
Pollution Prevention and Resource Efficiency		**X** *The development of rice perimeters at national scale may cause an accurate use of pesticides, to struggle against pests.*
Public Health		**X** *Ebola outbreak in Guinea constituted a high risk that can hamper the displacement in borders and abroad. Also, the Covid-19 pandemic could maintain travel restrictions as it continues to spread.*
Physical and Cultural Heritage	***X***	
Lands and Soil Conservation	**X** *The proposed CRRP will have a co-benefit on carbon sequestration with sustainable land use*	

197. Explanation: The proposed project has been developed in alignment with a number of national and regional priorities, laws, policies, plans, and national technical standards underpinned in Part II, Section F. The project activities are mainly focused on capacity building, advice and support for rice producers who are willing to apply good techniques for sustainable land and water management in line with the applicable national regulations and laws. Land ownership is a crucial issue in the ECOWAS region, to this no activity that could lead to the expropriation of land is planned. In order not to harm people who do not have access to land, the consultations organized at the level of each country have recommended the development of criteria. Principle 2 related to access and equity describes this process.

Principle 2: Access and equity Screening result: **Low risk** resulting from activities under Output 2.1.1 and Output 2.2.1.

198. Explanation: Rural people and marginalized poor families who are not often integrated into the local politics and decision-making processes are the ones targeted by the project which could be a risk of insufficient access to the project resources by these people. The consultation workshops in the 13 countries have mainly highlighted the risk of the very high expectations of the communities and the misunderstanding of the project scope. Land tenure including lack of land ownership of certain categories of people (women, young, elderly, displaced people, refugees, etc.) has been identified as a potential risk that could lead to the exclusion of those who do not have hold land or who do not have the right to dispose of land because of local rules or national regulation. Widows and divorced women have virtually no tenure or inheritance rights with which to ensure food security for themselves or their children. In certain cases, women may have access to land as gifts from husbands and fathers.

199. As mitigation measures, it has been suggested during the consultation process (i) to explain explicitly, transparently and unambiguous during the launching process the project targeting and scaling up mechanism. This should be translated into the local languages so that everybody will be carried along; (ii) to provide priority to marginalized people who do not have land for access to other project activities such as PPPs; (iii) to develop selection criteria to be agreed with all the stakeholders. According to the population dynamic in the ECOWAS region, this approach will ensure that the project provides fair and equitable access without discrimination to all beneficiaries including the most marginalized and vulnerable groups.

200. The process of identifying project beneficiaries involves (i) the formulation of selection criteria and priorities and (ii) consultations with rice producer organizations and local authorities as well as potential communities. Selection criteria will consider practicality and feasibility, willingness to apply the project approach, exclusion from other previous development initiatives, potential synergies with other current development initiatives, and the presence of committed youth. Based on recommendations aligned to selection criteria targeted communities will be consulted and based on their potential and commitment a final selection considering the achievement of project outcomes/results will be made; and this again is subject to committed support and approval by the rice producer organizations and local authorities.

201. Communities and beneficiaries will be comprehensively sensitized to enhance priorities of the most vulnerable groups while ensuring their participation into decision-making and equal access to the project benefits. Besides, and as usual, OSS in accordance with its practices makes available to all direct and indirect beneficiaries of the project a grievance mechanism that will inform about conflict situations and will ensure access and equity.

Principle 3: Marginalized and vulnerable groups screening result: **Potential risk** resulting from activities under Output 2.1.2 and component 3.

202. Explanation: Many West African countries are prone to recurrent terrorist attacks and political instability leading to the displacement of people inside or outside the country especially in Burkina Faso, Mali, Niger and Nigeria. The table below summarizes the situation in the region

Country	Refugees & Asylum Seekers	Internally Displaced people
Burkina Faso	22,078	1,218,754
Mali	48,547	346,864
Niger	240,728	300,320
Nigeria	304,562	1,920,000

Source UNHCR on April 30, 2021 (Situation Sahel Crisis (unhcr.org))

203. This very volatile situation in the project's intervention area risks increasing the marginalization of these people, excluding them from the benefits of the project or affecting them by certain planned activities. Women and youth represent the vast majority of the population in most countries in the Sahel. They are a highly vulnerable group and strongly affected by poverty in the Sahel region. The impacts of climate change on this group have consequences for the whole region. The consultation workshops have highlighted that women, widows, youth, refugees, internal displaced people and people living with disabilities are the main marginalized and vulnerable groups in the region. These peoples are the unlikely to have access to land and to participate actively to the project. Based on this volatility, the project also takes into account the potential displacement of economic and livelihood related activities that may arise and proposes the use of IGAs to support the uplifting process as well as the issue equality within project beneficiaries both direct and indirect.

204. To mitigate this risk, these vulnerable/marginalized groups such as women, youth and displaced peoples' representatives have been considered during the design of the project. A gender study has been established for a better understanding of the social construction and dynamic is the areas. As a result, the project components were designed to encourage the participation of marginalized and vulnerable groups and to develop specific activities are targeting women and youth.

205. A deeper consultation and additional assessment will be carried out during the baseline and the capacity needs assessment in the inception phase to avoid exclusion of marginalized groups and to minimize potential impacts related to the project activities. In order to avoid the exclusion of these communities all activities implementation must be decided in common with consultation of all concerned communities.

Principle 4: Human rights Screening result: **No risk**

206. Explanation: The targeted countries recognize fundamental human rights and freedom without discrimination because of race, national origin, color, religion, opinion, belief, or sex. The project activities will not engage in any activity that may result in the infringement on the human rights of any person during implementation. The proposed project respects and adheres to all relevant conventions on human rights, national and local laws and both countries are also part of various human rights treaties. The planned activities are not discriminatory by tribe, age and gender or, level of education. The project design relied on the consultative approach involving various stakeholders. No activities are identified whose execution is not in line with the established international human rights. Project objectives promote basic human rights for fair and equitable access to resources to enhance their resilience to climate change in the beneficiary countries.

Principle 5: Gender equality and women's empowerment Screening result: **Potential Risk** resulting from activities under Output 2.1.1 and 2.2.1 with mitigation measures as the project has built-in targets and indicators for the inclusion of women in its results framework.

207. Explanation: Women's status and representation may limit their meaningful participation in project activities and benefiting its outcomes. Indeed, women throughout the region face numerous challenges that either are more severe than those faced by men or that men don't face, including access to land, finance, vulnerability to climate change and the ability to recover quickly from shocks.

208. In ECOWAS Region, men and women do not have equal access to land, even where legislation has removed gender barriers to land ownership. In most situations, women's access to land and other property generally occurs through a male relative in local areas. In common with the gender division of labor, the gender division of private property is regarded as natural, and therefore not to be questioned. Women's effective exclusion from the possession and control of land is largely the basis of their subordination and dependence on men in local communities. As in most of 'patrilineal' Africa, the usufruct right to land prevails and customary land use practices often determine access to land in terms of use rights or ownership. Women are essentially temporary custodians of land passing from father to male heir, even though they may be de facto heads of household.

209. There is a risk that some of the activities under Output 2.1.1 would increase gender inequality, because they suppose that the beneficiary of the activity is the owner of the land, so this may exclude most women. CRRP is based on inclusion of gender equality and women empowerment issues with activities sensitive to gender equality particularly

equal rights, responsibilities, opportunities and access of women and youth to resources allocated to improve their resilience to the current and future climate change effects.

210. As highlighted in the Gender Assessment and Action Plan, the project has been developed with a special focus on women and youth groups especially for capacity building, leadership in rice producer organization to ensure that they fully participate and benefit from the project. Women will be engaged in activities along the rice value chain that support the project such as PPPs under Output 2.2.1. Targets have been set for coverage of women in all the project's interventions related to training, capacity building, and sensitization activities. This will ensure that women will have equal access to project benefits.

211. During the implementation phase, it is planned (i) to carry out communication and sensitization of populations on the gender issue to ensure gender equality in PPP activities, (ii) to strengthen the representation of women and youth in the various consultation workshops, and (iii) make available a grievance mechanism that can be used by women and youth.

Principle 6: Core labor rights Screening result: **Potential risk** resulting from activities under Output 2.1.1

212. Explanation: The project does not have any activity that poses a threat to the rights of the farmers. However, there is a risk that there could be exploitation of marginalized people providing their workforce to the project. Noting that the risk is low since the 13 countries have ratified the international labor standards and transposed into law all eight fundamental conventions of the International Labor Organization.

213. Women in rural agricultural markets are disadvantaged compared with their male counterparts even though they constitute a significant proportion of family workers. They are less likely to engage in wage employment than men, and when they do, they are more likely to hold part-time, seasonal and/or low-paid jobs in the informal economy. These issues emerged clearly during stakeholder consultative meetings.

214. In addition, there is a risk of late or unpaid salaries or remuneration non- compliant with the countries' labor legislations and laws. In West Africa, thousands of children are engaged in hazardous activities in rice farming, including clearing fields, working in flooded fields, and applying pesticides. While most of the children work alongside their families, others have no family relationship with the farmer and have been recruited for the season. During the consultations where national and regional stakeholders have been involved, the core labor rights have been highlighted to ensure that labor legislations are adhered to. Consequently, children's labor will be forbidden as well as remuneration inequity between men and women. Awareness-raising on the danger and impacts of worst forms of child labour will take place as part of the sensitizations and training session. It is also planned to ensure that all of the labor involved will be wages according to best common practices in the districts and villages.

Principle 7: Indigenous people Screening result: **No Risk**

215. Explanation: In West Africa, several groups identify as indigenous peoples due to their historic occupation of the Sahara and the Sahel, their continuous adherence to economic and cultural systems of pastoralism and their ongoing marginalization from the political economy. These peoples include the Tubu, the Fulani, and Bassaris. During the full project development process, a data collection questionnaire was developed and shared with the thirteen countries. The tool has allowed the identification of the ethnic groups in each of the project intervention area (Link). The assessment of the data led to the identification of socio-professional groups rather than indigenous people or tribes in the project areas. Thus, the project will not affect any indigenous group but will promote the respect of the rights and responsibilities outlined in the United Nations Declaration on the Rights of Indigenous People. To note is that was highlighted that the countries tend to be divided into ethnic groups and do not recognize indigenous people per se. It should also be noted that the project will consider the most vulnerable and marginalized groups as well as people living with disabilities. The consultative approach will be a continuous process during activities execution and the FPIC process will be applied throughout the whole project duration.

Principle 8: Involuntary resettlement Screening result: **No risk**

216. Explanation: The project will work with communities in their locations on a voluntary basis. The SRI / CRRP practices will be part of communities' normal cultivation process and will not cause a delay in cultivation or constitute a constraint in access to land and assets. Even in the absence of the project, the farmer will apply his traditional method and receive his usual earnings. Therefore, with the approach supported under this project no physical and economic displacement is foreseen, and impact will be nil. The project benefits will occur at the individual plot.

Principle 9: Protection of Natural Habitats Screening result: **Potential risk** resulting from activities under component 3

217. Explanation: The project will be implemented on thousands of sites spread across the ECOWAS region. Despite this large geographic coverage, the site selection criteria applied by the countries took into account, among other things: the fragility of the ecosystem, the presence of a protected area, national or international interest areas. The project will undertake the CRRP/SRI technique in the already existing individual farmers' fields and plots. Adopting the SRI technique is voluntary by the rice farmers and will be applied on their own lands. The gains through the adoption of the technique are so important that they could lead some people to convert other lands to rice cultivation.

218. Despite these measures, the greatest risk identified during the consultations is that the activities may lead expending the farms and to wetland (especially mangrove) degradation and removal and the degradation of the riverbanks. In addition, the proposed project will be undertaking commercialization of harvesting of rice and its sub-products,

organization of demonstration and trainings sessions on the field, etc. which may impede slight risks on the natural habitats. Degraded areas will be restored with natural vegetation in case that will happen.

219. As mitigation measures, it is planned to: Include training on sustainable land development and preparation methods including zero or minimum tillage (ii) organize awareness to discourage the opening of virgin forest for cropping and draining of mangroves for rice paddies and vegetable farming.

Principle 10: Conservation of biological diversity Screening result: **Potential risk**

220. Explanation: As part of the implementation of the project, new agricultural practices, may represent a form of disturbance for the flora and can affect the biological diversity. Although, the protection of ecosystems and their biological diversity is an essential objective of the project, converting land for rice production may affect the biological diversity. The training modules will be developed in order to guide the populations in the selection of new lands for rice cultivation to avoid the negative effects on the environment. In fact, CRRP as a methodology protects, improves, and regenerates the natural resources and does not imply the introduction of a new invasive species. The project implementation will result in a multitude of environmental benefits, including improved soil health, water saving, reduced emissions in greenhouse gases, reduced use of chemical fertilizers and pesticides, and improved biodiversity.

221. During the implementation, follow-up and monitoring of the execution of activities related to the protection and management of ecosystems will be undertaken. In fact, pre-surveys of the proposed areas will be conducted to avoid sensitive habitats that have a high diversity of flora and fauna. Promotion of awareness sessions, capacity building and exchange visits to strengthen the efficient management of natural resources will also be undertaken.

Principle 11: Climate change Screening result: **No risk**

222. Explanation: Rice farming is one of the GHG emission sectors and the project may increase that. Proposed project activities aim to enhance the resilience of ecosystems and populations to climate change through improving the resilience of rice production with the implementation of the CRRP/SRI technique. Training sessions on how to drain rice paddies to reduce CH4 emission and improvement in nutrient management including the retention of rice residues are also planned.

Principle 12: Pollution prevention and resource efficiency Screening result: **Potential Risk**

223. Explanation: Agricultural production increase requires intensification through efficient struggle against crops enemies or mineral fertilizers use. More specifically, the development of vegetable perimeters at a national scale may cause an accurate use of pesticides, to struggle against pests. In the absence of a real integrated struggle against growing pests, rice production increase could lead to accurate use of chemical pesticides. The use of chemicals is linked with on fight against disease vectors, crop destroyers and manures. In zones where agriculture is practiced, water conveys agricultural pesticides and various toxic residues, which accumulate in the water surface. Fertilizer may lead to water surface degradation, soil salinization, alkalization and acidification. In addition, minor risks related to rice harvesting, threshing, milling, parboiling, storing and commercialization through the introduction of soil impurities, wastewater and solid waste are also possible.

224. As a mitigation measure, the project intends to promote efficient use of natural resources and to help farmers to adopt new agricultural practices such as improved soil management, practices resilient to climate change emphasized under output 2.1.1. The planned activities will not generate pollution and loss of resources. It will contribute to sustainable land management, efficient water use and prevention of water pollution. Because SRI plants are healthier and stronger and the humidity in the plant canopy is reduced, pest and disease attacks decline and pesticide use can be limited or omitted entirely. Furthermore, the use of chemical fertilizers and pest control will not be encouraged or supported by the project, but instead, manure, compost and organic pest control remedies will be promoted.

Principle 13: Public Health. Screening result: **Potential risk**

225. Explanation: The rice farmers are usually prone to water-borne diseases. Rice cultivation may lead to water- or vector-borne diseases (such as cholera and Malaria) increase, and the proliferation of insects near the farms, so, it is mandatory to raise awareness and support mechanisms to implement disease awareness and management programme for Malaria and Bilharzia. If the project did not take proactive measures, this could have negative impacts on public health. This project will contribute to improving the health conditions of the rice farmers and communities with the CRRP/SRI technique where water use is optimized and reduced up to 50%. The increased income generated by the introduction of the SRI technique can be used for other household needs such as schooling the children, accessing health care, and/or investing in other economic activities.

226. Ebola outbreak in Guinea constituted a high risk that can hamper the displacement in borders and abroad. The project has been developed in line with the national sanitary regulations related to COVID-19 and provision has been made to cope with other disasters such as Ebola during the implementation phase.

Principle 14: Physical and cultural heritage Screening result: **Potential Risk**

227. Explanation: Expending rice farms may lead to the loss and disturbance of cultural resources such as sacred forests and archaeological sites. Regarding cultural heritage, the introduction of new rice farming practices may experience some resistance from communities and Chief. The project aims at enhancing the traditional knowledge and know-how of the rice farmers and supporting them to adopt and build on the CRRP/SRI as an innovative technique.

228. Consultation process will continue during the implementation of the project through awareness campaigns to communities on how the CRRP/SRI as an innovative technology will enhance the traditional knowledge and supporting them to increase their incomes.

Principle 15: Land and soil conservation Screening result: **No risks**

229. Explanation: The region's landscapes are affected by degradation, particularly in the fast-growing agricultural lands where natural vegetation cover has been removed, and fragile soils have been exposed to wind and water erosion. Since 1975, West African forests have declined from about 131,000 sq. km to just 83,000 sq. km. Much of that deforestation was driven by agricultural expansion, which doubled in area between 1975 and 2013. Traditional rice production is characterized by soil degradation and clearing of virgin forests or land. Through the approach proposed under CRRP, no damage to soil, vegetation and land resources are expected to occur. Sustainable intensification of land will reduce the need for further deforestation. Besides, SRI-CRRP is an agro-ecological and climate-smart agriculture approach that promotes land and soil conservation. In fact, by reducing the use of irrigation water by up to 50%, soil aeration is supported, which stimulates the root growth of the rice plants. Additionally, through organic matter-enriched soils, nutrient and water holding capacity in soils are improved, more carbon is stored, and beneficial soil biota support crop nutrient uptake and protect against disease. In addition, the project will undertake awareness raising on the impact of deforestation on the landscape and on agriculture.

230. **Cumulative Impacts of the Project** - In the long-term, the project has the potential to have an impact concurrent with other third parties the same resources which could result in a number of cumulative impacts, such as: i) deforestation due to the exploitation of forest resources to be converted into rice production, and ii) waste production due to multiple waste and dumping sites from uncoordinated organic fertilizer management.

231. The ESMP proposed by the project will ensure through monitoring that activities and their outputs meet permissible limits under national law and international best practice. The project will oversee to reduce negative impacts by implementing mitigation measures. The consultation with communities will be part of the ESMP monitoring to ensure that the impacts of planned project activities are well recorded and reported.

PART III IMPLEMENTATION ARRANGEMENTS

A. Project implementation and management arrangements

232. **Regional Implementing Entity (RIE) -** The Sahara and Sahel Observatory (OSS) acting as the AF accredited entity will be the project Regional Implementing Entity (RIE). OSS will be responsible for providing project oversight in all financial, administrative and legal aspects. The RIE will also conduct monitoring, audit and supervision activities and ensure the annual reporting to the Adaptation Fund (AF). It will provide technical and management support to the Executing Entities at regional and national levels. It will be responsible for ensuring compliance of the project activities with the ES and gender Policies of the AF and adherence to monitoring of the ESMP. The RIE will also have the responsibility to handle and support the Grievance Mechanism Process of the project and ensure that it will be accessible, transparent, impartial, confidential, and predictable to the potential complainants.

233. **Executing entities -** Project execution will involve stakeholders at the regional, national and local levels, as follows:

Regional level:

234. **Regional Executing Entity (REE) -** The Regional Center of Specialization in Rice (RCoS-Rice) hosted by the Institute of Rural Economy (Institut d'Economie Rurale - IER) in Mali sponsored by the ECOWAS shall act as the REE. The RCoS-Rice will coordinate and execute the project at the regional level and will ensure the coordination of project activities in the 13 countries in close collaboration with the 13 National Executing Entities (NEEs). The RCoS-Rice is designated to lead research on rice for the entire region under the scientific and technical coordination of the West and Central African Council for Agricultural Research and Development (CORAF/WECARD).

235. As the Regional Executing Entity, RCoS-Rice will support the NEEs in capacity building and knowledge management, creating a cross-learning environment, and strengthening regional partnership building. RCoS-Rice will provide demand-driven support and consolidate reports from the executing countries. In addition, RCoS-Rice will support monitoring interventions and ensure that the regional aspects of the project are well articulated and completed. To guarantee the regional role, the project will adopt the following rules: i) Cooperation and coordination in data and information sharing, ii) Sharing available technology and expertise, iii) Minimizing and/or eliminating duplication of efforts, and iv) Contributing to regional frameworks in the ECOWAS region.

236. A Regional Project Management Unit (RPMU) will be established or co-opted from the REE and composed of key human resources defined in the table below. The team will be approved by the RIE upon delivery of a No-objection request on ToRs detailing their roles and responsibilities based on merit and skills.

Table 28 : Roles and responsibilities of RPMU

Staff	NO	Role and responsibilities
Project Coordinator	1	Overall strategy and direction; Coordination at regional level; Stakeholder engagement at regional and national level; Oversight management, M&E, consolidation of reporting, learning and documenting Organization of the regional steering committee meetings and events Development of regional Annual Work Plan and Budget Development of regional Procurement Plan Compilation of technical and financial reports
M&E Expert	3	Overall responsibility for M&E implementation; Ensure application of USPs methodology and compliance with ESP; Coordinate data collection and analysis; Responsible for identification of emerging issues; Secure reporting to OSS;
Gender Expert	1	Overall responsibility for gender aspects; Coordinate data collection and analysis on gender; Responsible for identification of emerging issues related to gender; Ensuring compliance with gender policies and procedures; Communication and dissemination of project lessons;
Administrative and Finance Expert	2	Overall responsibility of Finance and administration; Assisting in the preparation of budgets; Managing records and receipts; Reconciling daily, monthly and yearly transactions; Providing administrative support to the region Preparation of the financial reports and communicating to the RIE

237. **Regional Steering Committee (RSC) -** The overall supervisory body of the RICOWAS project is the Regional Steering Committee (RSC), which will meet once a year, is the policy and oversight committee that will supervise the project at the regional level. It will be composed of key stakeholders working in climate change and rice value-chains. The RSC members will include but not limited to CILSS, ECOWAS, UEMOA, members of the West Africa Regional Climate Adaptation Action Plan, the “Rice Offensive” initiative, West African Rice Farmers Umbrella Organization (CRCOPR/ROPPA), private sector, NGOs, Academia and research and development organizations (e.g. CORAF/WECARD...). The Regional Executing Entity acting as the RSC secretariat will be in charge of organizing the meetings and reporting.

238. The RSC and its national branches will examine and approve Annual Reports, Procurement Plans and Annual Work Plans and Budgets for the National and Regional levels. The composition and operating mechanisms of these committees will be defined in writing by agreements between the different entities (OSS, REE and NEEs). Their meetings will follow the regional annual evaluation and programming workshops.

239. **Regional Technical and Scientific Committee (RTSC)** - In addition to the RSC, the RCoS-Rice will strengthen the RICOWAS project by mobilizing a cluster of institutions at the regional level, with complementary scientific and technical roles to support the regional execution of project activities. This cluster could build partnerships between RICOWAS partners and other regional stakeholders working on climate adaptation issues and in the rice value chain. These include, among others: CILSS, ECOWAS, UEMOA, the Niger, Mano and Senegal Rivers Organizations, the regional executing entities of the West Africa Regional Climate Adaptation Action Plan, the “Rice Offensive” initiative, the West African Rice Farmers Umbrella Organization (CRCOPR/ROPPA), and the Cornell University, which contributed to building the CRRP approach.

National level:

240. **National Executing Entities (NEEs) -** The National Executing Entities (NEEs) will constitute the pillars of the project implementation led by their appointed representatives, the National Facilitators (NF). The 13 NEEs were designated by the National Designated Authorities (NDA) of the AF and their supervising institutions during the project formulation phase. The national project activities will be undertaken by the NEEs, which have the knowledge and facilities to carry out these tasks. Moreover, the NEEs will ensure stakeholder ownership of the project, capitalization on other initiatives implemented and guarantee the sustainability of its results by establishing appropriate mechanisms and tools during the project execution. In addition, the NEEs will oversee data collection and consolidation from the project sites and link with the REE for a better synthesis and harmonization for dissemination. In addition to the technical and financial reports that the NEEs will provide to the REE, they will collaborate with Accredited National Entities of the AF for capacity building and communication.

241. The NEE will have a specific project execution-oriented team, led by the NF under the supervision of the National Institution (Director, Supervisor, etc.). The number and profile of the team members for each NEE will be developed

according to the project needs defined in the Project Implementation Manual (PIM) and based on the assessment undertaken at the beginning of the project. The terms of references for the team and its operational modalities will be submitted to the RIE for No-Objection. To execute project activities, NEEs have governance units established at the project zone or local level. The executing arrangements at the national level will involve all relevant national actors of the rice value chain, including but not limited to: Ministries responsible for the Environment and Agriculture, umbrella organizations of rice value-chain stakeholders (with specific attention to gender and vulnerable groups), SRI/CRRP champions, local and international NGOs, private sector, specific public-private partnerships, and technical and financial partners.

Table 29: Roles and responsibilities of NPMU

Staff	NO	Role and responsibilities
Project Coordinator	1	Overall strategy and direction; Coordination at national level; Stakeholder engagement at national and local level; Oversight management, M&E, consolidation of reporting, learning and documenting Development of national Annual Work Plan and Budget Development of national Procurement Plan
M&E Expert	1	Overall responsibility for M&E; Ensure application of USPs methodology and compliance with ESP; Coordinate data collection and analysis; Responsible for identification of emerging issues; Secure reporting to RPMU;
Gender Expert	1	Overall responsibility for gender aspects; Coordinate data collection and analysis on gender; Responsible for identification of emerging issues related to gender; Ensuring compliance with gender policies and procedures; Communication and dissemination of project lessons;
Administrative and Finance Expert	1	Overall responsibility of Finance and administration; Assisting in the preparation of budgets; Managing records and receipts; Reconciling daily, monthly and yearly transactions; Providing administrative support to the region Preparation of the financial reports and communicating to the RIE and RPMU

242.

Table 30: National Executing Entities (NEEs) for RICOWAS

	Country	Institution
		National Executing Entity (NEE)
1	Benin	Secrétariat Général du Ministère de l'Agriculture, de l'Elevage et de la Pêche (SG/MAEP)
2	Burkina Faso	Direction générale des études et des statistiques sectorielles / Ministère de l'agriculture et des aménagements hydro-agricoles
3	Côte d'Ivoire	Agence Nationale d'Appui au Développement Rural (ANADER) / Ministère de l'Agriculture et du Développement Rural
4	The Gambia	Ministry of Agriculture
5	Ghana	CSIR-Savanna Agricultural Research Institute (SARI)
6	Guinea	Institut de Recherche Agronomique (IRAG)
7	Liberia	CHAP
8	Mali	Direction Nationale de l'Agriculture (DNA)
9	Niger	Institut National de la Recherche Agronomique du Niger (INRAN)
10	Nigeria	Agricultural Research Council of Nigeria (ARCN)
11	Senegal	Agence Nationale de Conseil Agricole et Rural (ANCAR)
12	Sierra Leone	Rokupr Rice Research Centre/Sierra Leone Agricultural Research Institute (SLARI)
13	Togo	Institut de Conseil et d'Appui Technique (ICAT)

243. **National Steering Committee (NSC) -** At the national level, the project will be guided by a National Steering Committee (NSC), which will meet at least once a year. The NSC will be composed of multi-sectoral stakeholders including Ministries in charge of Agriculture, Ministries in charge of the Environment, National Designated Authorities of the AF, Ministries in charge of communities' organization, Ministries in charge of the finances and trade, National Environment Authorities/Agencies and Climate Change Directorates. The committee will further include representatives from accredited NIE to ensure synergies with other projects funded by the AF in particular:
    - Benin: Fonds National pour l'Environnement et le Climat (FNEC);
    - Côte d'Ivoire: Fonds Interprofessionnel pour la Recherche et le Conseil Agricoles (FIRCA);
    - Niger: Banque Agricole du Niger (BAGRI);
    - Senegal: Centre de Suivi Ecologique (CSE).

244. The NSCs will meet physically at least once a year and in light of the budget constraints, the meetings will be held back-to-back with other planned meetings where the NSC will play a key role. If required remote meetings can also be organized for a closer follow-up. Depending on the available budget at least one representative of the NSC will take part in the RSC meetings and act as an intermediary to ensure continuity and harmonization of the execution of project activities, and to guarantee communication among the project governance bodies at regional and national levels.

245. As potential involvement, national rice farmer organizations, women and youth, umbrella organizations, as well as other relevant technical partners from research, extension, private sector, and NGOs will be invited to take part in the committee. Taking into account each country's specificities, the NSC may emulate already existing institutional arrangements, in order to achieve efficiency, satisfy all RICOWAS requirements and avoid heavy mechanisms.

246. The orientation and guidance of the NSC will be country-specific and provide strategic direction for the execution of the project. It will approve the national Annual Work Plan and Budget (AWPB), will ensure compliance with the RSC's guidance, and report to it on a regular basis.

At the local level

247. The project execution teams will closely collaborate with local government structures to carry out project activities following planning guidelines developed by the NEEs in collaboration with the local government structures. It is important to recall that the RICOWAS project requires a strong involvement of local agricultural service providers to the communities (including extension, technical training and research services). This will play a crucial role in CRRP training and provide assistance to rice farmers and other stakeholders in the rice value chain. The NEE will designate Project Zone Focal Points (PZFP) for each project zone to coordinate and oversee RICOWAS activities in their areas. Annual project zone meetings organized by the PZFP, inviting local and communities' representatives including women, youth, vulnerable groups to evaluate the year's activities (n) and plan for following year (n+1). Their reports will be used by the NF to prepare the AWPB to be submitted to the NSC.

Table 31 : RICOWAS project entities, their roles and functions

N°	Entities	Acronym	Entities' name	Roles and Functions
Regional Level	Regional Implementing Entity	RIE	Sahara and Sahel Observatory (OSS)	- Oversee overall financial and monitoring aspects of the project - Reporting of project consolidated results to the AF - Approval of project AWPBs (national and regional) - Approval of Procurement plans (national and regional) - Approval of reports (M&E, quarterly and annual financial and technical) - Provide administrative and management support to the executing entities according to the PIM - Provide technical advice, guidance and support to the project - Provide financial advice, guidance and support to the project - Ensure supervision, audit and evaluation of the project activities progress and achievements - Ensure compliance with ES and gender policies - Ensure adherence to GRM process and procedures
	Regional Executing Entity	REE	Regional Center of Specialization in Rice (RCoS-Rice) hosted by the «Institut d'Economie Rurale - (IER)»	- Project management and execution at the regional level - Develop and update the regional AWPB and PP annually - Organize and report the RSC meetings annually - Ensure incorporation regional dimension aspect in the project (link between the NEEs) - Provide support and facilitation necessary for the proper execution of the activities within a harmonized framework - Provide technical advice, guidance and support to the project - Support communication, networking and partnership building at regional and national levels Undertake on a day-to-day basis the management of regional project activities according to the approved AWPB and PP and PIM - Set up a monitoring and evaluation mechanism at the regional level to collect data from NEEs - Provide technical and financial reports to OSS based on national reports
	Regional Steering Committee	RSC	Key stakeholders working on climate change and the rice value-chain: CILSS, ECOWAS, UEMOA, the regional executing entities of the West Africa Regional Climate Adaptation Action Plan, the "Rice Offensive" initiative, the West African Rice Farmers Umbrella Organization (CRCOPR/ROPPA), the private sector, NGOs, universities (Cornell and others) and research and development organizations (CORAF/WECARD etc.)	- Supervise the project at the regional level - Provide guidance on project execution - Examine and approve reports (National and Regional Annual Reports, AWPB and PP) - Ensure the regional dimension aspect is incorporated into the project activities
National Level	National Executing Entities	NEEs	- Benin: Secrétariat Général du Ministère de l'Agriculture, de l'Elevage et de la Pêche (SG/MAEP) - Burkina Faso: Direction générale des études et des statistiques sectorielles / Ministère de l'agriculture et des aménagements hydro-agricoles - Côte d'Ivoire: Agence Nationale d'Appui au Développement Rural (ANADER) / Ministère de l'Agriculture et du Développement Rural - The Gambia: Ministry of Agriculture - Ghana: CSIR-Savanna Agricultural Research Institute (SARI) - Guinea: Institut de Recherche Agronomique (IRAG) - Liberia: CHAP International - Mali: Direction Nationale de l'Agriculture (DNA) - Niger: Institut National de la Recherche Agronomique du Niger (INRAN) - Nigeria: Agricultural Research Council of Nigeria (ARCN) - Senegal: Agence Nationale de Conseil Agricole et Rural (ANCAR) - Sierra Leone: Rokupr Rice Research Centre/Sierra Leone Agricultural Research Institute (SLARI)	- Ensure the national coordination of the implementation of the project activities - Support project management and execution at the national and local level - Prepare the N-AWPB to be discussed and adopted during the annual regional workshops - Ensure the project creates a positive impact for the beneficiaries - Create partnerships with the national stakeholders and partners - Consolidate results from the project sites and link with the REE - Ensure cross-fertilization of project interventions and increase their ownership at the national level - Assure the monitoring and evaluation at national level - Provide technical and financial reports to REE - Designate Project Zone Focal Points (PZFP) for each project zone to coordinate and oversee the project activities in their areas

			- Togo: Institut de Conseil et d'Appui Technique (ICAT)	
	National Steering Committee	NSC	Multi-sectoral stakeholders including: Ministries in charge of Agriculture, Ministries in charge of Environment, National Designated Authorities of the AF, Ministries in charge of community organizations, Ministries in charge of finances and trade, National Environment Authorities/Agencies, Climate Change Directorates, representatives from accredited National Implementing Entity (NIE) of the AF: - Benin: Fonds National pour l'Environnement et le Climat (FNEC) - Côte d'Ivoire: Fonds Interprofessionnel pour la Recherche et le Conseil Agricoles (FIRCA) - Niger: Banque Agricole du Niger (BAGRI) - Senegal: Centre de Suivi Ecologique (CSE) As potential involvement: national rice farmer organizations, women and youth umbrella organizations and other relevant technical partners from research, extension, private sector, and NGOs.	- Provide strategic direction for the project at national level - Approve the N-AWPB - Ensure compliance with the RSC's guidance and report to it on a regular basis - Ensure continuity and harmonization of the implementation project activities - Guarantee communication between the project governance bodies at regional and national levels - Emulate already existing institutional arrangements, in order to achieve efficiency, satisfy all project requirements and avoid heavy mechanisms - Provide strategic direction for the implementation of the project at country level
Local Level	Local governments structures			- Create a conducive environment for the program execution, especially by mobilizing communities and technical experts at the local levels - Provide support for extension agents involved in the CRRP/SRI technique dissemination and training for the benefit of communities - Provide political support and advocacy - Ensure ownership and sustainability
	Community structures / Producers organizations			- Key partners and implementers of the program at the local level - Labor and local material contribution for project activities (in-kind contribution to the project) - Ownership and sustainability by establishing community management structures

248. **Gender-responsiveness of project implementation***:* The Regional Implementing Entity (OSS) and the Regional Executing Entity (CRS-RIZ/IER) have both a dedicated staff member specialized on gender that will be part of the project team and ensure that project approaches are effectively integrating the gender-perspective in all project activities. All the National Executing Entities have experience with managing and implementing projects that mainstream gender in their activities, for instance for various technical and financial partners (World Bank, GIZ, European Union, FAO, UNDP, etc.) who work with gender-inclusiveness and responsiveness throughout their project implementation processes. The NEEs have also the responsibility to implement the gender action plan of the RICOWAS project, in addition to the governmental strategies on gender. The RICOWAS implementation arrangements, including the institutional programming and the project evaluation system, are set up to disaggregate indicators by gender and youth. The project's implementation arrangements from local to regional level offer also opportunities during annual or more frequent meetings to monitor the implementation of the gender action plan.

249. Indeed, a gender focal point responsible for gender aspects will be designated by the regional implementing entity and will work with the gender officers at EE level to ascertain engendering of the project activities at all levels.

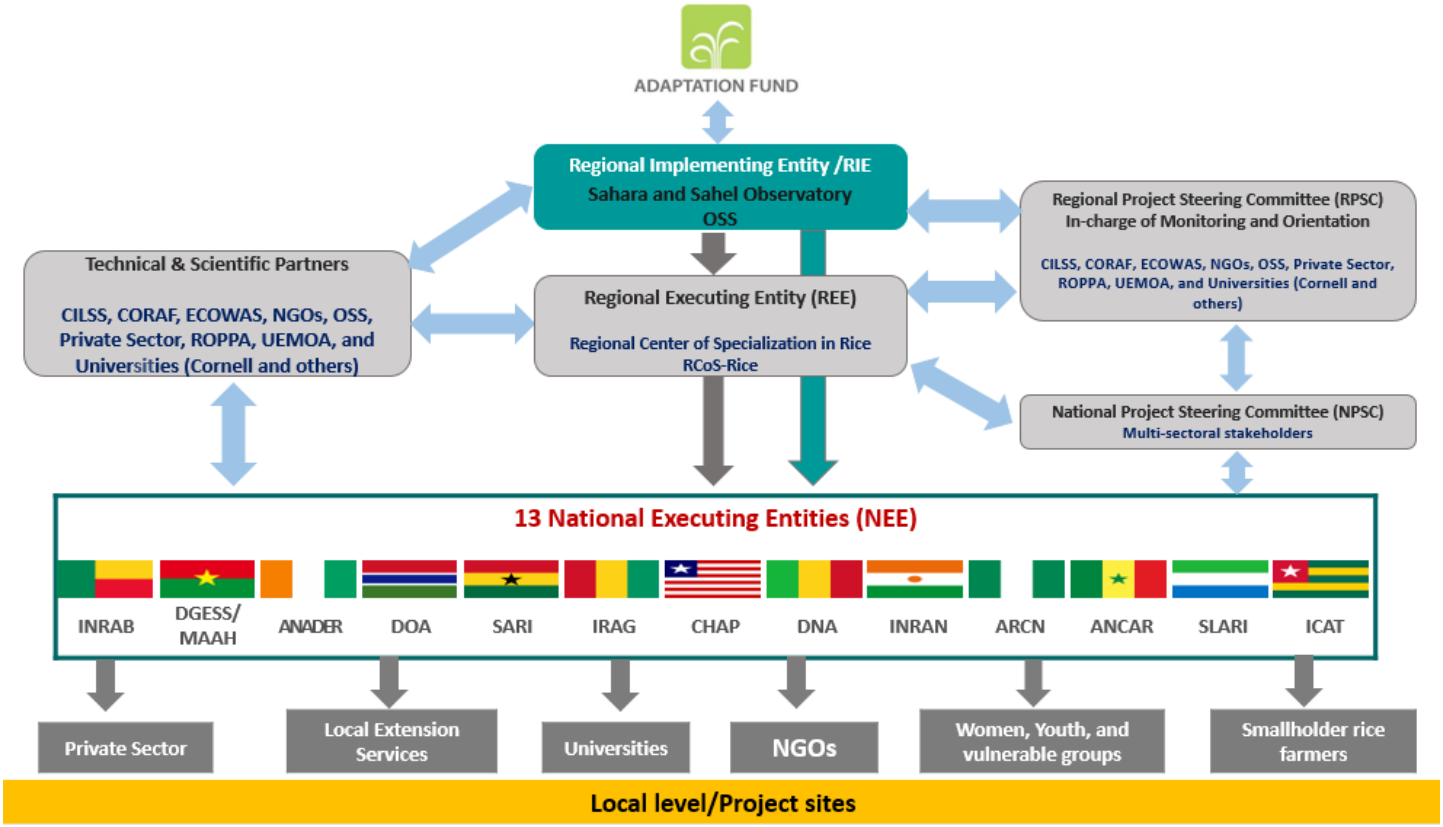

Figure 7: RICOWAS project institutional arrangement organogram

B. Measures for financial and project risk management.

250. The fact that the project is multinational, it is anticipated that there will be both financial and project management risks during its implementation. Due to the different political and geographic contexts of the countries, it is expected that they may face challenges and risks that are either similar or different. The issues are exacerbated by the COVID-19 and Ebola outbreaks and the instability in the region. Overall, the anticipated project risks are summarized by country in the table below:

Table 32 : Main financial and project risks and mitigation measures

Risk	Country	Rating	Risk Mitigation Measure
Terrorist attack	Mali, Niger, Burkina Faso and Nigeria	High	Monitor OCHA publications across the region regarding the terrorist attack and conflict situations and follow International NGO Safety Organisations' directive to: - Suspend activities until the situation returns to normal - Change the intervention area if it is no longer safe and under the control of the government
The Covid-19 virus impact	All countries	High	- Follow up closely on and adhere to any national regulations regarding hygienic measures, permitted behavior in terms of meetings and travel restrictions; - Assure continuous communication with staff regarding the situation; - Hold meetings virtually when the situation requires;
Multiplicity in currencies and their instability in currencies, market prices	All countries	High	The thirteen countries use different currencies. All funds will be maintained in USD to reduce the impact of price and currency fluctuations.
Ebola outbreaks hinder the implementation of activities	Guinea, Mali, Senegal, Sierra Leone, Liberia Côte d'Ivoire	Medium	Follow the epidemic situation and the WHO publication about its spread and apply the required measures according to their guideline that may include to: - Suspend activities until the situation returns to normal - Change the area of intervention if it is no longer safe and under the control of the government for project staff, access to and use of hygiene provisions, etc.;
Low collaboration amongst the relevant technical institutions at national level	All countries	Medium	- The involved institutions have been identified, consulted and engaged and will be regularly involved in project development and implementation - Agreements will be made with the respective departments on the scope of activities executed. MoUs will be signed with the agriculture extension services; - Institutions will be engaged and brought together during early stages of project implementation, during progress reviews, and other vital moments;
National executing entities are understaffed and can't reach the requirements	All countries	Medium	- A PMU composed of appointed and recruited staff will be set up at NEE level to ensure the day-to-day project management, the coordination of the activities at national level, and the linkage with the other countries; - Capacity building of the executing entities on specific topics: Data collection, implementing the M&E system, and ESMP/GAP monitoring

Delay in disbursements	All countries	Medium	The Implementing entity will assess the capacity of the executing entities through the due diligence process to faster contracting. Grant Agreements will be signed with the relevant authorities to rapidly disburse funds for project activities while ensuring standards for financial management, procurement and minimizing provisions. the risk of corruption
Different pace of project implementation for each country may delay overall project implementation and affect regional activities.	All countries	Medium	OSS will establish appropriate project management and coordination structures at both regional and national level to monitor, report on and discuss progress on a regular basis and take corrective action where needed to ensure that the project moves at the required pace in all countries. National level implementation plans on an annual basis will be developed to guide the countries activities
Delay in the implementation of project activities	All countries	Medium	- The development of the first Annual Work Plan and Budget to prioritize the activities such as the establishment of the baseline; the capacity needs assessment and development of training modules - Starting the drafting and the discussions on the ToRs of these activities immediately following the signature of the Grant Agreement with the AF to anticipate the implementation of these time-consuming activities
Movement of trained staff to other sectors or outside the project areas.	All countries	Low	Working both with farmers as well as with a wide variety of relevant institutions in the project zone areas will aim to ensure that capacity remains within the project zone areas even when there is some movement of staff.
Political uncertainties affect project implementation	All countries	Low	The project might have targeted some areas that might become relatively unstable politically. All efforts will be made to ensure that project activities are conducted with participation of all relevant stakeholders including government departments and local structures in order to contribute efficiently to conflict resolution should any arise
Delays in recruitment or appointment of critical staff for the project.	All countries	Low	TORs for project staff will be prepared in advance of project commencement and key recruitments will be made as early in the project as possible
Project financial management	All countries	Low	-Strengthen the project financial management and accountability systems through the use of the proper and approved procedures, and in compliance with Adaptation Fund and OSS regulations and standards. -Separation of roles in financial management will strictly be enforced and adhered to.
Poor monitoring and evaluation and delayed delivery of outputs	All countries	Low	-The project will develop a detailed participatory M&E framework with the key project partners -Regular follow-ups by NEEs and REE; timely and continuous implementation of the monitoring and evaluation system

C. Measures for environmental and social risk management

Environmental and Social Management Plan

251. This project aims to strengthen the resilience of populations to the adverse effects of climate change through the promotion of CRRP. Despite the positive impacts that it may generate, the implementation of activities, in particular Component 2, could lead to negative impacts that should be mitigated. In accordance with the AF Environmental and Social Policy, the project has been subject to an environmental and social risk assessment and has been classified **as Category B.** Potential negative impacts resulting from this project are considered to be small scale, limited to the area of the project, reversible and can be avoided, minimized or addressed through the use of recognized good environmental and social management practices. The risks identified for the 15 E&S principles of the Fund in section L, Part II have been described there and concrete mitigation actions have been proposed and to avoid, counteract or minimize their occurrence and impact. As stipulated in the narrative part II Section A of the project activities description, there are some Unidentified Sub-Projects that will require additional environmental and social screening to ensure compliance with the AF policies. Despite the USPs the project category will be maintained under Cat. B, using the exclusion criteria and avoiding the activities that could have a important risk and impact on the environmental and social aspects. In addition, the ESMP implementation budget allocated will include the assessment of the USPs potential risks. The following table presents the generic measures that can be envisaged for the project as a whole.

Table 33 : Summary of Potential Impacts and Mitigation measures

Checklist	Potential impacts	Mitigation Measures	Indicators	Responsible	Cost (USD)
1- Conformity with the law	• The project is in full compliance with the countries policies, standards and laws. With an environmental risk category of "B", the project adheres to ensuring that all safeguards are in place to ensure that the activities of the investment do not exacerbate environmental degradation. .	• The fully identified project activities do not generate risks related to conformity with the law so there are no mitigation measures to plan.			
2- Access and Equity	• Risk of insufficient access of the project by a segment of the population • Elite capture in allocating project benefits • Lack of interest to participate in project activities	• Selection criteria will be developed by considering practicality and feasibility, willingness to apply the project approach, exclusion from other previous development initiatives, potential synergies with other current development initiatives, and the presence of committed youth. • Project beneficiaries will be selected through few phases, including (1) screening of potential beneficiaries during consultation with the rice producer organizations and communities, (2) face-to-face meeting and visit to the farm of the beneficiary in order to assess her/his skills of farming and readiness to accept the project terms. • To ensure the equal participation of refugees, women, youth, elderly and other potentially vulnerable groups, dedicated consultations and working groups with these groups will be organized to provide ample space for the consideration of the specific needs of these stakeholder groups. • Close monitoring of the project beneficiaries to assure equal access of men; women, youth and the most vulnerable. • A grievance redress mechanism would support community members and stakeholders to submit any complaint.	• Nb of selection criteria agreed on • Nb of workshops • Nb of participants to these workshops and gender distribution • Nb of complaints	OSS IER/CRoS-Rice 13 EEs	140,000 USD It is incorporated in the investment cost of the project (*baseline, trainings et workshops*)
3- Marginalized and vulnerable groups	• Lack of land ownership may affect negatively some vulnerable groups	• Marginalized people who do not have land will be given priority for access to other project activities such as PPP. The project will also closely monitor the targeting of all project beneficiaries to ensure equal access of refugees, internal displaced people, women, youth and the most vulnerable. • Explain explicitly, transparently and unambiguous during the launching process the project targeting and scaling up mechanism. This should be translated into the local languages so that everybody will be carried along. • Provide priority to marginalized people who do not have land for access to other project activities such as PPPs	• Nb of KAP conducted • Awareness sessions to explain the project in local languages during each launching workshops • % of refugees/internally displaced people involved on the project • % of PPP beneficiaries without land • Nb of complaints	OSS IER/CRoS-Rice 13 NEEs	42,000 USD It is incorporated in the investment cost of the project (*launch, M&E*)
	• Some project activities could increase inequalities and hamper the livelihoods of project beneficiaries	• KAP will be conducted in each country to collect feedback from the population including marginalized groups • Grievance mechanism			

4- Human rights	• The project activities do not generate risks related to human rights.	• The project activities do not generate risks related to human rights so there are no mitigation measures to plan. • Grievance mechanism			
5- Gender Equality and Women's empowerment	• Women's status and representation may limit their meaningful participation in project activities and benefiting it outcomes	• Ensure the presence of women and young people in workshops and trainings. • A Gender Assessment Action Plan have been developed to ensure that women are meaningfully engaged in project activities and realize an equitable share of project benefits • Communication and sensitization of the population on the gender issue to ensure gender parity in PPP. • Specific activities and innovative equipment will be developed for easier use by women and youth (engendered tools) • Grievance mechanism.	• % of women and youth participating in workshops and trainings • % of women beneficiaries of PPP • % of women in the POs • Nb of complaints	OSS IER/CRoS-Rice 13 NEEs	20,000 USD It is incorporated in the investment cost of the project (*Baseline, communication plan, PPP and workshops*)
	• The majority of those involved and benefiting from the project's field agricultural activities will be men who are mostly landowners	• Women will be specifically targeted to benefit from PPP. This will enhance their access to finance and enable them to generate income, contributing directly to their financial empowerment.	• % of women beneficiaries' PPP resources	OSS IER/CRoS-Rice 13 NEEs	
6- Core Labour Rights	• In rural areas where the presence of the state is not very strong, late or unpaid salaries or remuneration non- compliant with the countries labour legislations and laws may occurs as well as Child labour.	• Check during the field visits and trainings the presence of Child labor; • Communication and awareness raising about Child labor. • Grievance mechanism.	• Nb of checking report • Nb of awareness sessions • Nb of complaints	OSS IER/CRoS-Rice 13 NEEs	3,000 USD It will be part of the training, technical assistance and M&E
7- Indigenous People	• The planned activities will not affect the indigenous people	• The project activities do not generate risks that trigger this principle so there are no mitigation measures to plan. • Grievance mechanism			
8- Involuntary Resettlement	• The project activities do not conduct to involuntary resettlement	• The project will train communities on their own lands so no mitigation measures for resettlement is planned			
9- Protection of natural habitats	• Expanding of farms to wetlands, riverbanks and other vulnerable ecosystems such as mangroves.	• The project will be implemented in existing farming lands and will have no harm on natural habitats • Follow-up of the implementation of all activities related to the protection and management of ecosystems and natural habitats. • Awareness sessions to local populations on good environmental practices and the protection of natural habitats.	• Nb of monitoring reports including specific section on activities related to the protection and management of ecosystems • Nb of awareness sessions on the protection of the ecosystems	OSS IER/CRoS-Rice 13 NEEs	3,000 USD It will be part of the training, technical assistance and M&E
10- Conservation of biological diversity	• New agricultural practices may represent a form of disturbance for the flora and can affect the biological diversity. • Minor impacts induced by commercialization of harvesting of rice and its sub-products, organization of demonstration and trainings sessions on the field, etc. • Use of low quality of rice seeds and plants	• The defined interventions (CRRP) will not affect the biological diversity. It is mainly about sustainable agricultural practices • Include training on sustainable land development and preparation methods including zero or minimum tillage • Organize awareness to discourage clearing of virgin forests for cropping and draining of mangroves for rice paddies and vegetable farming.	• Surface (ha) of areas under CRRP • Nb of meetings and training organized on sustainable land • Nb of training topics on the protection of the ecosystems • Nb of established local nurseries	OSS IER/CRoS-Rice 13 NEEs	3,000 USD It will be part of the training, technical assistance and M&E

		• Establishment of local nurseries to produce high quality and adapted to SRI			
11- Climate change	• Emission of greenhouse gases: the approach promoted by the project activities do not generate risks related to climate change. The proposed measure will enhance the positive impacts of the project	• The proposed CRRP will have a co-benefit on carbon sequestration with optimal use of water for rice production • Training session on how to use alternate wetting and drying irrigation method to reduce CH4 emission and how to improve nutrient management including the retention of rice residues	• Nb of meetings and training organized on how to drain rice paddies	OSS IER/CRoS-Rice 13 NEEs	
12- Pollution prevention and resource efficiency	• Rice intensification may lead to an accurate use of pesticide and chemical fertilizer	• Awareness session on the danger of the use of chemical fertilizers and pesticides • Promotion of the use of manure, compost and organic pest control remedies	• Nb of awareness sessions on manure, compost and organic pest control remedies • % of project beneficiaries using the manure, compost and organic pest control remedies	OSS IER/CRoS-Rice 13 NEEs	3,000 USD It will be part of the training, technical assistance and M&E
13- Public Health	• Rice cultivation may lead to water- or vector-borne diseases (such as cholera or Malaria) increase, and the proliferation of insects near the water points	• Raise awareness and support mechanisms to prevent and control spread of water related diseases such as Malaria and Bilharzia among the program workers and local communities	• Nb of awareness sessions on diseases • Nb of participants in these sessions and gender distribution	OSS IER/CRoS-Rice 13 NEEs	3,000 USD It will be part of the training, technical assistance and M&E
	• COVID-19 can favour the displacement across borders and abroad. Ebola outbreaks in Guinea constitute a high risk that can hinder the implementation of activities	• Follow the national sanitary regulations and provisions made to cope with other disasters such as Ebola and COVID-19 during the implementation phase.	• Nb of information sheet on the epidemic situation based on WHO publication about its spread • % of compliance with national regulations regarding hygienic measures, permitted behaviour in terms of meetings and travel restrictions		
14- Physical and Cultural Heritage	• The introduction of new rice farming practices may face the resistance may experience from communities and the Chief	• Awareness raising sessions on how the CRRP/SRI as an innovative methodology which will enhance the traditional knowledge and supporting them to increase their incomes	• Nb of sessions organized	OSS IER/CRoS-Rice 13 NEEs	3,000 USD It will be part of the training, technical assistance and M&E
15- Soil and land conservation	• Some activities may lead to soil degradation and clearing of virgin forest or land	• The proposed CRRP (SRI+SLWM) will have a co-benefit on carbon sequestration with sustainable land use • Raise the local population's awareness to strengthen the sustainable management of soil and land • Reduction of water use for irrigation • Composting production will contribute to increase soil quality and fertility	• Surface (ha) of areas under CRRP • Nb of awareness sessions on sustainable management of soil and land • % of water use in the irrigated plots • Nb of composting units created	OSS IER/CRoS-Rice 13 NEEs	3,000 USD It will be part of the training, technical assistance and M&E

Cumulative Impacts of the Project

Potential impacts	Mitigation Measures	Indicators	Responsible	Cost (USD)
• Potential to have negative impacts (concurrent with third-party activities) on the same resources	• Consultations and coordination to ensure that implementation and management have reduced cumulative impacts	• Meetings, • Trainings/workshops	IER/CRoS-RICE 13 NEEs Interested stakeholder	3,000 USD It will be part of M&E

Unidentified Sub-Projects (USP)

Methodology of Impact Assessment and Risk Management

Compliance with Adaptation Fund policies

252. All activities implemented under the USP modality will adhere to the AF Policies to which the RICOWAS Project is subject to. These policies include: (i) The Adaptation Fund Environmental and Social Policy rev. March 2016 (AF ESP), which sets out the requirements for IEs to assess and manage environmental and social risks in project implementation. The AF ESP defines the E&S Principles that AF projects abide by as well as defining the adoption of measures to avoid, or where avoidance is impossible to minimize or mitigate those risks during implementation. Any USP identified and implemented in the RICOWAS Project will, without exception, comply with the E&S Principles defined in the AF ESP ; (ii) The Adaptation Fund Gender Policy and Action Plan March 2016 (AF GP), which defines the objectives and principles that AF funded projects shall comply with in order to secure the uphold of women's rights as universal human rights, and in order to attain the goal of gender equality and the equal treatment of women and men. Any USP identified and implemented in the RICOWAS Project will, without exception, comply with the Main Principles defined in the AF GP.

253. The USP Policy for RICOWAS is furthermore informed and guided by the AF Guidance Document, published on May 2021, stating "*Further Compliance with the Environmental and Social Policy and the Gender Policy of the Fund: Update of the Project/Programme Performance Report and guidance for unidentified sub-projects*" (AFB/B.32-33/7).

Compliance with OSS Environmental and Social Safeguards

254. The Environmental and Social Safeguards (ESS) of the RICOWAS Project, and inherently for the USPs, are assured through OSS policies and procedures which are based on the International Finance Corporation (IFC) Environmental and Social Sustainability Framework. This ensures that potential risks and impacts are iteratively identified, mitigated and monitored throughout the life-cycle of the Project.

255. The Environment and Social risk management is completed through two main stages: (a) Preliminary Risk Screening with respect to the ten Performance Standards (PS) prescribed in OSS E&S policy that all projects should comply with. This phase is implemented during project preparation and leads to a categorization of the project according to its risk level; (b) On-going Risk Screening of the project interventions during the implementation phase. Activity-wise risk management is governed by OSS' risk management procedure which is in line with the internationally recognized standards, and more specifically the ISO 31000:2009, Risk management - Principles and guidelines.

256. Operational procedures will be implemented to ensure a continuous screening of all project activities and interventions for the identification of arising risks and impacts.

Adherence to National Technical standards

257. Equally, for the compliance with the AF ESP and GP, with OSS ESS, and in line with these, the RICOWAS project is compliant with national laws, and adheres to all National Technical Standards that are applicable to the project. As such, all activities implemented as USPs will comply with these laws and standards.

258. All national laws and technical standards identified during the development of the FP and are applicable to the RICOWAS project have been listed in tables 19, 20, and 21 and will be subject to updating if and when necessary for activities with USPs. Any USP identified and implemented in the RICOWAS project will, without exception, comply with the identified national laws and technical standards of the 13 project countries. The USPs environmental screening and potential ESIA should be in line with the national laws and regulations as the activities will be executed at national level. If some of the USPs requires detailed assessments or specific ESIA the involvement of national authorities in charge of these aspects will be ensured.

Unidentified Sub-Projects (USPs) in the RICOWAS Project

259. The USP policy applies to activities that have been identified as USPs, and of which the detailed scale, scope and location, and other technical aspects are not yet fully identified at the time of full proposal development.

260. For the RICOWAS project, the USP policy will be applied to: (a) all activities related to the promotion and implementation of SRI and CRRP practices (activities under outcome 2.1); (b) activities related to the establishment and reinforcement of public-private partnerships and agricultural associations and cooperatives (activities under outcome 2.2).

261. As mentioned in the section (Part II.A), a rich database is already available and was developed under the SRI-WAAPP project that will also be elaborated further during implementation. This database is the results of the baseline assessment and various studies and reports previously developed. Also, as part of the project development process, baseline data was collected and verified through a detailed questionnaire specific to the planned project activities. In the same framework, activity 2.1.2.2 is one of the first activities to be carried out after the project launch. This will have a determining role in the USP protocol as it will provide and identify the details and modalities to be respected and implemented to ensure the successful execution of all project activities, especially those identified as USPs during the development of the project document.

262. Once the necessary clarifications and details related to the implementation of the activities identified as USPs have been provided through Activity 2.1.2.2, the EEs will conduct a specific and detailed environmental, social and gender assessment moving forward. This assessment will be done in accordance with national regulations and standards for conducting an assessment such as an EIA and under the supervision of OSS to ensure compliance with OSS and AF

safeguards. The costs related to the environmental, social and gender assessment will be charged on the budget line of each activity as stated in the project detailed budget.

Procedures for identification and validation of USPs

263. Overall, in the ESMP for the RICOWAS project, procedures are defined in case significant risks are identified. As such, when impacts or risks are determined, activity-wide E&S assessment will be conducted which, in turn, will lead to the identification of activity-specific E&S management measures that need to be incorporated into the project execution. Identification, treatment and monitoring of identified risk and mitigation measures will be managed using a Risk Register. The process will be governed by the Risk Management Procedure of the AF and OSS.

264. Throughout all the project's phases, OSS will ensure a thorough identification of all the risks related to the USPs according to the 15 ESP. The identification and validation process will be launched during the different stages of project implementation. This aspect will be included in the different official project documents such as i) the project implementation manual (a chapter listing the responsibilities of the executing entities for this aspect and guidelines in line with OSS and AF standards and requirements will be formulated ; ii) the Procurement Plan (PP) and Annual Work Plan and Budget (AWPB) (a budget will be clearly identified for these activities) ; iii) the Terms of Reference for the recruitment of consultants/firms for the elaboration of the different studies and iv) the concept notes of the workshops/trainings and meetings related to activities that includes USPs. Also, during the different supervision and audit missions that OSS will conduct in the project countries, the national and local project teams will be sensitized to this aspect.

265. During the assessments process to be undertaken in each specific project location for all USP for all ESP principles, a particular attention will be given to the identification of marginalized and vulnerable groups (beyond women and youth), indigenous people, ethnic groups, and socio-professional groups as well as child labor and SLM considerations.

266. For each Unidentified Sub-Project, ESIA will be carried out to predict and assess the potential environmental and social impacts and design appropriate mitigation, management and monitoring measures. The process will be in compliance with national standards, AF and OSS Policies and will include the following steps:

- **Screening**: It is a tool for predicting, understanding and assessing potential sub-project/activity impacts. In other words, it aims to determine if a sub-project/ activity is likely to have significant environmental and social effects. Aligning with the 15 principles of the AF, the purpose of Screening is to determine whether or not an EIA is required;
- **Scoping**: If a full ESIA is required, scoping establishes the studies that will be required as part of the ESIA process including the identification of data availability and gaps. It determines the appropriate spatial and temporal scopes for the assessment and suggests suitable survey and research methodologies;
- **Impact Prediction and Evaluation**: This is the main part of the ESIA and involves analyzing the impacts identified in the scoping to determine their nature, temporal and spatial scale, extent and effect. Impact analysis requires input from relevant experts, including agronomists, ecologists, biologists, sociologists and economists. Once the potential impacts are fully understood, it is necessary to judge the significance of each impact, to determine whether it is acceptable, requires mitigation or is unacceptable. Consultations with local stakeholders is vital at this stage, and particular attention should be given to vulnerable and disadvantaged communities and risks arising from involuntary resettlement. Successfully identifying and addressing significant impacts at this stage can be key to obtaining both a formal and informal license to operate;
- **Mitigation**: aims to eliminate or reduce negative sub-project/activity impacts through suggesting appropriate measures;
- **Environmental and Social Management Plan (ESMP) and its monitoring**: Also called an Environmental Action Plan (EAP), it defines resources, roles and responsibilities required to manage sub-project/activity impacts and implement mitigation measures. The ESMP forms a link between the ESIA and the Social and Environmental Management System/entity. The central elements of a ESMP should include a detailed description of the activities planned to mitigate impacts, a time line and identification of resources to ensure the ESMP can be delivered, and a communication plan that indicates how progress in the implementation of the mitigation measures will be disclosed. The ESMP should also define monitoring requirements or indicators to determine whether mitigation is successful or needs to be improved or changed;
- **Evaluation**: Also called The Environmental Impact Statement (EIS), is the physical report on the ESIA process and findings. The EIS should provide a clear review of potential impacts and how they have been or will be mitigated. The report often forms the basis of public consultation activities and is the document that is presented to regulatory authorities as the basis for decision making.

USPs exclusion criteria:

267. The approval of Unidentified Sub-Projects will be based on the application of the above described methodology. This will include the assessment of technical, economic, social, and environmental compliance with AF and OSS policies. Furthermore, in accordance with AF guidelines to define exclusion criteria for USPs, OSS takes into account the following:

- **Modified seeds:** It will be recommended to avoid the use of genetically modified seed varieties. Indeed, when applying the USPs protocol, the choice of seed varieties will be based on (i) the standards in force at the country

level such as the official catalogue of species and varieties approved by each country (ii) the preferences of the farmers in each country (iii) the use of varieties resistant to drought, diseases and salinity (iv) the food preferences in each region (iiv) the use of local resilient seeds.

- **Water irrigation techniques**: The CRRP-SRI approach is a water efficient technique. The application of water-intensive irrigation techniques will be excluded in the framework of this project's activities. There will only be the promotion of resilient irrigation techniques. To this end, storage tanks and wells will be installed to support rice farmers for irrigation in the project intervention areas. These infrastructures will be screened according to the USPs methodology and non-viable will be avoided.
- **Energy-intensive irrigation techniques:** The project will promote the use of Renewable Energy (RE) sources for irrigation activities (pumping and others). The application of the USPs methodology described above will exclude the use of non-renewable energy sources, which will create potential environmental and social risks, and will ensure a thorough assessment of the potential risks that may arise from irrigation activities.
- **Irrigation with poor quality water:** Knowledge of the rate of decrease of nutrients from soils resulting from poor water quality application is essential for long-term planning of rice crop production while minimizing the impact on groundwater quality. In light of the above, a USP will not be characterized and categorized as a USP based on the use of poor water quality as this is a regional project with shared aquifers and shallow ground water.
- **Use of heavy machinery:** Based on USP categorization, heavy machinery will not be considered and the application of EIAs during project implementation will be taken into account as part of the ESMP developed and baseline to be updated accordingly. Impacts such as soil compaction leading to increased density of the soil, reduced air volume and a reduced ability to drain off surplus water as well supporting terraforming leading to land dereliction will be avoided.
- **Land Tenure System (LTS)**: No USPs that requires land acquisition with significant resettlement impact, will be eligible for support under the RICOWAS project. To minimize land acquisition and its impacts: (i) the consultative process that is constantly ongoing and a collaborative approach to identify the suitable spots to be utilized for the SRI practices will be strengthened, (ii) there will be negotiated agreements with beneficiary farmers/affected owners and communities for usage of land, and (iii) there will be no significant adverse environmental or social impact from the USPs. The project will thus consider this LTS and apply it where necessary but not limit it as a USP due to the fact that the 13 countries have different systems taking into account the administrative angle.
- **Displacement of populations**: A wide and well-structured consultative process involving local authorities, communities and marginalized groups representatives already done during the project development phase will be implemented. This will be the approach RICOWAS project is adopting to avoid displacement and livelihoods loss during execution of project activities and USPs taking into account the AF standards and the ESMP.
- **Areas affected by acute social conflicts**: At the project inception phase the baseline study will among others assess the security aspects in the project zones and will refine the selection criteria of site selection to avoid areas where social conflict could impede the execution of the project activities. Thus the USPs in such areas will not be considered.
- **Use of chemical fertilizers and bio-pesticides**: The SRI-CRRP practices are promoting the use of organic fertilizers and bio-pesticides. To this end, under activity 2.1.1.3. and activity 2.2.1.4 the project will assist farmers in promoting the production of organic fertilizers by farmers and will establish PPPs to ensure the sustainability and viability after the project end. Given that the composting technique and location of the production unit is not yet known the project will ensure the compliance with the AF and OSS ES standards using the USPs compliance methodology and will avoid the techniques that could have any negative environmental and social impact.

Project Grievance Mechanism

268. The proposed project will utilize the existing OSS grievance mechanism to allow affected populations to raise concerns that are not complying with its social and environmental policies or commitments.

269. OSS has established a grievance mechanism through its procedures, which is an independent mechanism whereby a matter, resulting from a project financed or implemented by OSS may file a complaint. The grievance mechanism, which is made available to stakeholders in OSS website, is part of the environmental and social policy to address compliance as well as lodging USPs identified and grievance cases that may arise during implementation by OSS where a public guideline defines the complaint resolution mechanism. It aims to establish an effective dialogue between those affected by the projects' it finances and all interested parties, to resolve the problem(s) the origin of a request, without seeking to assign responsibility or fault to any of these parties.

270. **At the OSS (RIE) level:** the grievance mechanism is coordinated and managed by OSS environmental and social committee (OESC). Communities and other stakeholders which will be affected by the project can submit complaints to OSS, the IE of the present project by: mail, email, fax or phone to the address indicated. Complainants may also refer the matter to the Ad hoc Complaint Handing Mechanism (ACHM) of the Adaptation Fund if the IE is not responsive or are not content with the outcome of their complaint.

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271. **At the project level:** The NEEs are the contact point for any project-related complaints from stakeholders in each country. The National project management with the support of the REE should respond promptly and appropriately with the support of the OESC. Where the complaint cannot be managed at the project level, the NEE or REE will direct the complainants to OSS for further action. The complainants will provide complete information in the form for proper assessment of the complaint(s). It will be the responsibility of the NEE and REE, under the control of OSS, to ensure that all relevant stakeholders are adequately informed about the grievance mechanism through awareness and sensitization campaigns highlighting the issue of potential USPs and how to address them . This mechanism will be made available and widely diffused during the launching workshops and the meetings and trainings. The guideline of grievance mechanism will be made available on the project and the regional executing entity website (RCoS-Rice/IER). The procedures on how to submit the complaint are available on the website of the OSS or directly at Guide traitement doleances. If the OESC finds that a complaint is eligible, the OESC composes internal and/or external experts' team to investigate the case and proposes options for the complainant to consider.

Country	Complains reception
Regional	**Institut d'Economie Rurale - IER (RCoS-Rice)** Rue Mohamed V Bamako - Tel: (+223) 20223775 - Website: www.ier.ml
Benin	(1) National Platform of Professional and Farmers' Organizations (PNOPPA) (2) Platform of Civil Society Actors in Benin (PASCiB)
Burkina Faso	(1) Village Committees
Côte d'Ivoire	(1) Producer organizations; (2) Local authorities
Gambia The	(1) Farmer to extension agent; (2) extension agent to RAD
Ghana	(1) Community chiefs/palace (2) the community assembly members
Guinea	(1) Community radios (2) Village meetings
Liberia	(1) Community chiefs/palace (2) the community assembly members
Mali	(1) Local authorities (Town hall, Regional/Provincial Councils)
Niger	(1) Local authorities, (2) technical services
Nigeria	(1) Local authorities
Senegal	(1) Administrative authorities, (2) customary authorities
Sierra Leone	(1) Local authorities
Togo	(1) Community chiefs/palace, (2) justice

272. **Complaint Handling Process – Filling-in a complaint:** Anyone or communities affected by project activities can fill in their complaint or claim in several forms and several ways. In accordance with the principle of accessibility and depending on the context, the method of filing complaints will be diversified: *i) At the national or regional level,* complaints will be addressed directly to the OSS or the AF via the contacts presented above and via social networks; and *ii) At the local level,* complaints can be addressed to local authorities; or NEEs. Contacts of NEEs and REE will be made public at the beginning of the project execution.

273. The mechanism will use all possible means and channels (traditional and modern) to receive complaints or claims (anonymous or not). These will include, among others: Telephone call, the phone is widely spread in the target area; Self-referral during supervision missions; Facts noted during meetings or a field visit; Social networks (WhatsApp, etc.), web page of the project, email address of the project, OSS website; Mail via complaint boxes in the localities concerned by the project.

274. Receipt and registration of complaints**:** this is ensured by the NEE, which is responsible for receiving all complaints related to the project activities and impacts. Complaints received will be recorded upon receipt and the traceability procedure will be established. They are generally classified into 2 groups: (a) Non-sensitive complaints related to the implementation process, including choices, methods, results achieved; and (b) Sensitive complaints generally concern personal misconduct such as corruption, sexual abuse, discrimination.

275. The NEE will send a formal acknowledgment (by email or letter) within a maximum of one week. In this, the recipient will be informed of the next steps and if necessary, he/she will be asked to provide clarifications or additional information for a better understanding of the problem.

276. Complaint handling**:** This involves verifying the eligibility of the complaint to the mechanism and ensuring that the complaint is related to the project's activities or commitments. The aim will be to establish the link between the facts denounced and the project's activities and impacts. The eligibility assessment will also determine whether the case should be dealt with under the Project-specific grievance mechanism or referred to other mechanisms (whistleblowing, etc.).

277. In the case of unfounded complaints**,** it is essential to conduct the necessary investigations to preserve the project's reputation. This task is the responsibility of the REE and the NEEs. Unfounded complaints include among others those that have a lack of necessary information or are the result of rumors or malicious persons, which may harm the proper conduct of the project. Public complaints or accusations broadcasted to a wider audience that are considered unfounded complaints will be addressed at IE and REE and NEEs, and may be followed by a formal statement.

278. In the *case of* well-founded complaints*,* two kind of responses can be applied: (i) direct response and action to resolve the complaint; and (ii) broad and thorough audit is required, and joint investigations, dialogues, and negotiations could be conducted to reach a substantial resolution. This may involve extending the team to national and local experts.

279. Following the audit and investigations, a contextually appropriate and formal explanatory response is given to the complainant. It should include the procedures to be followed by the NEE to manage the complaint or propose the appropriate bodies to be contacted for cases that do not fall into their responsibilities.

D. Monitoring and evaluation arrangements and budgeted M&E plan

280. The goal of the project monitoring and evaluation (M&E) system is to systematically collect data and generate insights about the processes and outcomes (both anticipated and unanticipated) of the project in the service of three purposes: (1) learning, (2) continuous project improvement through adaptive management, and (3) accountability. The M&E system is designed to produce insights that are useful, accurate, and credible to relevant stakeholders, and to do so in feasible ways. This is done by undertaking systematic and objective assessments of project activities, outputs and outcomes in terms of their design, implementation status and results. Overall, the approach represented in the M&E system reflects the guidelines of the Adaptation Fund (aligning with the Evaluation Framework, Results Framework and Baseline Guidance at project-level, Guidelines for Project/Program Final Evaluations, and Results tracker guidance). In addition, the project evaluation will deal with strategic issues such as project relevance, effectiveness, and efficiency, as well as impact and sustainability, considering specified expected outcomes.

281. **Scope of monitoring and evaluation -** The M&E system will be implemented at the three levels in which the project is involved: i) regional level, ii) national level, and iii) local or project zone level. The system is tailored specifically to the needs, motivations, strengths, and limitations of stakeholders at each level. To this end, a stakeholder assessment will be conducted at the beginning of the project (Activity 1.2.2.1). Because of the multilevel and decentralized nature of the project, it is necessary for the M&E system to be focused on how information flows vertically between the three levels and horizontally within levels of the system. In any capacity building or Training-of-Trainer situation, information and knowledge necessarily flow through intermediaries who are strategically located between project implementers (the regional executing entity) and the ultimate intended beneficiaries (rice farmers in target areas).

282. Also, in an M&E system in a complex, multilevel project or system, there is a heightened need to find a careful balance between (top-down) standardization and (bottom-up) localization. Standardized approaches (e.g., the use of shared data collection tools) allow aggregation of data at the national and regional level, leading to stronger conclusions. Yet localized data are often more meaningful and relevant to local-level participants; those stakeholders' buy-in can lead to more evaluative thinking, better data, and stronger conclusions. In that vein, it is important to note that while the M&E system is pre-planned, some details of the system (results) are subject to slight adjustment early in the project that is based on a participatory process that includes the National Executing Entities, the key-stakeholders and SRI champions in each of the countries.

283. **Monitoring and Evaluation entities -** The M&E system for the RICOWAS project will be associated with all the project implementing and supervising entities in order to guarantee an effective project implementation. The roles and responsibilities for each of the entities are specified in the following table.

Table 34 : Roles and responsibilities of project entities

Entity	Roles and Responsibilities
Regional Implementing Entity (OSS)	– Review and approve the Annual Work Plans and Budgets (national and regional) – Review and approve reports (annual progress and completion reports inter alia) – Provide recommendations and issue decisions on the orientation and management of project and M&E implementation – Undertake supervision missions – Undertake Project audits of the project – Monitor the implementation of recommendations and decisions
Regional Steering Committee	– Review and approve the regional Annual Work Plan and Budget (AWPB) – Review and approve the regional Procurement Plan – Review and approve reports (annual progress and completion reports inter alia) – Provide recommendations and issue decisions on the orientation and management of the project and M&E implementation – Monitor the implementation of recommendations and decisions – Continuous consultations with key stakeholders
Regional Executing Entity (RCoS-RICE)	– Prepare regional annual work plan and budget – Organize and provide support to RSC meetings – Prepare regional procurement plan – Elaborate the Project Implementation Manual – Monitor implementation of regional and national annual work plans and budgets – Develop the project M&E System, including the data collection, analysis and dissemination tools – Organize trainings for NEEs and national data collection staff to execute the M&E system – Oversee national M&E system development and execution – Prepare and consolidate reports (quarterly activity reports, semi-annual and annual progress reports, and project completion report.) – Disseminate project evaluation and monitoring reports
National Steering Committee	– Review and approve the Annual Work Plan and Budget (AWPB) – Review and approve procurement plan – Review and approve annual progress and completion reports – Provide recommendations and issue decisions on M&E system's orientation and management – Monitor the execution of recommendations and decisions
National Executing Entities (13 countries)	– Prepare the Annual Work Plan and Budget (AWPB) – Elaborate the procurement plan – Monitor project execution at the national level and in all project zones at the local level. – Train and oversee data collection staff at local level – Supervise specific studies – Prepare and transmit quarterly and annual reports to REE – Continuously gather, manage and analyze project data of the project's M&E reports and transmit the results – Implement recommendations and decisions from OSS, REE and NSC by adjusting the M&E system at national and local level

284. **Project launch -** The REE together with OSS will organize the project inception workshop in the first quarter of the project, inviting all national facilitators on behalf of the NEE, in addition to representatives from the most important project stakeholder groups. The goal of the workshop will be to introduce all participants to the project implementation arrangements, project goals, results framework and M&E system. The participants will then proceed to create the first Regional and National Annual Work Plans and Budgets (AWPB), which will be subsequently reviewed and approved by the Regional and National Steering Committees.

285. **Developing the M&E system -** In the first quarter of the project, REE will develop the M&E System and write up the Project M&E Manual. It will take into account M&E capacity at regional and national levels. Operational mechanisms will be set up between the regional, national and local levels and customized to each country's capacities and needs that allow for harmonized and reliable monitoring and data collection. A tracking methodology (in accordance with the Adaptation Fund's guidance and recommendations) will be established and tested by the NEE and field implementation partners in the first six months of the project. Based on feedback, the methodology will be adjusted and then validated for adoption by all countries and the RCoS-Rice for project use. It will be possible to create specific

additions to the M&E system responding to local ideas and needs. A regionally established database, housed by the RCoS-Rice, will be made accessible through a dashboard to all NEEs, who can use this dashboard to analyze their own data and submit the national data to the REE.

286. **M&E tracking tools trainings** A regional training of trainers' workshop and national trainings will be organized by the REE and NEE in using the data tracking tools. The goal is to roll out a simple but solid methodology that allows extension agents as well as farmers to collect data. The regional training will be designed to train the national M&E officers, responsible for the national data. They in turn will train the field agents and farmers at the national level who will be undertaking the field data collection.

287. **Baseline study -** Under guidance of the REE, baseline data that has already been collected during project preparation phase will be assembled and complemented with a targeted questionnaire to establish the project baseline in each of the 13 countries conform to the project's results framework. The baseline study will respond to all the indicators of the project activities, outputs and outcomes. The data will be collected in a manner that it can be disaggregated by gender, identified vulnerable groups, and age groups – all at the local level – as well as climate zones and rice systems, and specific environmental and social parameters that assist in the monitoring of the ESMP. This baseline information will be used as the starting point for the M&E system. It will also serve the project's annual planning and the progress evaluation of project implementation.

288. **Quarterly monitoring -** A quarterly monitoring reporting template will be created at the beginning of the project as part of the establishment of the data tracking methodology. The national facilitators (NF) will be responsible for gathering and assembling the data and information from the project intervention zones as well as the data that is produced at the national level. The NF will share these quarterly reports with the REE, which will be responsible for aggregating all data into one regional report. This report will be submitted to OSS for review and follow-up. The quarterly reports will provide the opportunity to closely follow project implementation activities and disbursement. It will also permit to raise flags in case certain constraints arise. Lessons learned can be identified at each step of implementation, and adjustments can be proposed in order to achieve the desired results and outcomes. The insights from these reports can also be used to strengthen emerging opportunities and to create or reinforce synergies.

289. **Annual monitoring and planning -** The four quarterly reports will represent the base for the annual monitoring report. The annual project progress will be presented by the NF during the national annual meeting that brings together all the stakeholders involved with SRI and CRRP in the country. All parties, even those not associated with the project, will share their annual progress, which will be followed by a planning process for the following year, especially identifying opportunities for collaboration and synergies to be created at the national level to support the scaling-up efforts of CRRP. NEE will then prepare the National Annual Results Report as well as the Annual Work Plan and Budget (AWPB) to be submitted to the National Steering Committee (NSC) for approval. The NSC review will happen ahead of the yearly Regional Technical Workshop, which will be organized by RCoS-Rice (REE), where national reports and plans will be validated. REE will also develop its Regional Annual Results Report and AWPB workplan, which will be submitted to the regional steering committee (RSC) for approval and validation during the regional workshop. Integrating all national and regional results, the REE will create one Annual Project Results Report and submit it to OSS. This report will track results performance based on project indicators and targets set in the results framework. The annual project results will be widely shared through the project's communication channels. OSS in turn will compile a Project Performance Report to be submitted to the AF.

290. **Mid-Term Evaluation -** After completing the second year of implementation, the project will conduct a mid-term evaluation. It will be undertaken by an independent consultant hired by OSS. The evaluation will assess the assumptions made during the preparation stage, including objectives, expected outcomes, outputs and associated indicators, as well as the current context of implementation. If indicated, certain modifications of activities and their targets can be proposed. The mid-term evaluation will also identify progress in achieving the targets and results. It provides the opportunity to focus on lessons learned from the first two years of implementation, and to strengthen the pathways to achieving the desired outcomes and impacts of the project.

291. **Final Project Evaluation -** At the end of project implementation, a final evaluation will be conducted by an external consultant hired by OSS. The final evaluation will assess, at the minimum, i) the achievements of the project's outcomes, ii) evaluation of risks to sustainability, iii) processes influencing achievements of results, including financial management, iv) contribution of the project to the Adaptation Fund's objectives, and v) and evaluation of the M&E system. The results of the evaluation will be presented in the final project workshop, and contribute to developing concrete recommendations for ongoing and future projects engaged in the scaling-up process of CRRP.

292. **Final report -** Three months before the end of the project, the regional facilitator will present a draft of the final report, that integrates contributions from the 13 national facilitators. The report will cover project results and identify lessons learned. More specifically it will provide an analysis of findings on climate-resilient rice production and successful climate adaptation measures, including the technical innovations developed and implemented by the project beneficiaries for the SRI methodology, improved soil and water management practices and integrated pests and diseases management practices. Most importantly, it will focus on reporting how the project activities have improved the socio-economic conditions of the project beneficiaries. These findings and results will be presented i) at the regional level, and ii) they will also be disaggregated by country, climate zone and rice systems, as well as by gender, youth and vulnerable groups. Recommendations will target sustainability, replicability and scaling-up of CRRP and will be of direct and invaluable service to policy and decision-makers in pursuing a climate adaptation pathway for sustainable rice production and agriculture.

293. **Monitoring of the ESMP -** The ESMP monitoring program presents the indicators to monitor the mitigation and improvement measures.

294. Given that the RICOWAS Project under component 2 includes USPs, the M&E system that will be developed and operationalized will take into account their existence. This will be subjected to the guidelines developed in line with the AF guidelines on USPs to monitor and address their related risks and impacts. A robust bottom-up approach will be undertaken and will include the beneficiaries during the selection of activities and their execution. This monitoring will be through the following actors:

295. **Implementing entity:** All E&S monitoring activities will be conducted under the supervision of the E&S committee of the implementing entity (OSS), which will send monitoring reports to the Adaptation Fund. In accordance with the ES policy of the Adaptation Fund, project monitoring and evaluation by the implementing entity must take into account all identified environmental and social risks and impacts. OSS will carry out monitoring and evaluation missions and will ensure the proper execution of the project according to the project schedule and that the funds are allocated for activities planned.

296. In the event of a grievance, the ESCO will clarify the situation and find the appropriate solutions to the problems posed. The annual reports to be submitted by OSS to the Adaptation Fund on the project implementation will include a section on the status of implementation of the ESMP and how the E&S risks/impacts are avoided, minimized or mitigated. The reports shall also include a description of the shortcoming corrections. The mid-term and final evaluation reports will also include an assessment of the project's performance in relation to E&S risks and grievance management.

297. **Regional Executing Entity (REE)**: The REE will be responsible for the supervision of the 13 NEEs activities related to monitoring the ESMP at local level and for submission of the ESMP report to OSS. This report will take into account the management of the 15 principles of the Adaptation Fund. This report should include grievance management.

298. Quarterly, the REE will gather the reports from the NEEs, who will rely on a bottom-up feedback system with community inputs. In order to ensure relevant monitoring, regular field visits will be organized i) to inspect and verify the efficiency of the mitigation measures and ii) to check the extent of the foreseen impacts. Given that this is a regional project, the impacts may also be regional and the limited expertise of the NEEs might not be sufficient to monitor these impacts adequately. The REE and the RIE will carry out regular field missions for close monitoring of risks, impacts and mitigation measures, especially those with a regional connotation. In this context, the involvement of all implementing and executing entities is necessary to ensure adequate monitoring of mitigation measures at the local, national and regional levels. The ESMP report should be submitted to OSS on a yearly basis.

299. **National Executing Entities (NEE):** The NEEs will be responsible for coordinating and monitoring environmental and social indicators. The NEE will also be in charge of analyzing data, managing local information systems and supervising the baseline establishment at the beginning of the project. The NEE will prepare quarterly reports and submit them to the REE.

300. **Local Communities**: The ESIA monitoring will also include a community-based component. In fact, the project plans to carry out training and capacity building sessions for the benefit of local agents and communities, in data collection and monitoring. Communities will be informed about the activity risks and will be involved in the implementation and monitoring of mitigation measures.

Table 35: Roles and Responsibilities of EM Program

Actor Involved	Responsibility/Role
Implementing Entity (OSS)	OSS will be committed to adherence to AF standards and ESP principles and will implement mitigation measures as part of the ESMP.
Regional Executing Entity (REE)	Monitor and disseminate the ESIA / ESMP, in particular its grievance mechanism, among relevant stakeholders and beneficiaries. Ensure that the implementation of the project complies with applicable national and standard regulatory frameworks. Monitor the implementation of ESMP activities and evaluate the effectiveness of the mitigation measures put in place.
National Executing Entities (NEE)	Each NEE will ensure the day-to-day implementation of the project and ensure regular monitoring, identifying any new potential risks for society and / or the environment during the project implementation, so that measures of support and appropriate attenuation can be implemented to be adopted on time.
Local Communities/ Project Partners	Provide information on potential new social / environmental risks that may arise during the implementation of the project. Assist in the implementation and monitoring of mitigation measures based on their expertise.

Table 36: Monitoring & Evaluation Work Plan and Budget

Type of activity	Responsible parties	Budget (USD)	Timeline															
			Y1				Y2				Y3				Y4			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Project Implementation Manual	REE	10,000																
M&E Manual	REE	15,000																
Baseline studies	13 NEE, REE	144,000 (40,000 at regional level + 8,000 per country)																
Field monitoring, supervision, quality and compliance assurance with OSS and AF guidelines ESP (USPs), Gender	OSS, REE, 13 NEE (M&E Officer and Gender Officer)	437,000 (24,000 each NEE + 80,000 OSS + 45,000 REE)																
Annual reports	13 NEE, REE	40,000																
Annual audit	External-13 NEE-REE	112,000 (2,000 per year per entity)																
Mid-term evaluation	External/OSS	30,000																
Final evaluation	External/OSS	30,000																
Final project audit	External/OSS	20,000																
Total Cost		**838,000**																

Ongoing

Milestones/Deliverables

301. For the M&E functions, the budget and breakdown of the RIE and EEs fees is in the detailed budget in table 40 (Part III, Section G) which includes notes and types of M&E activities that will be utilized for the supervision of M&E functions. Also, the RICOWAS results framework in table 37 indicates the related means of verification to achieve the targeted results.

E. Project results framework including milestones, targets and indicators.

302. The details for the implementation of the results framework will be determined in the M&E manual, which will be developed at the beginning of the project. It will be possible to disaggregate many of the indicators, for example, beneficiaries will be able to be grouped according country, climate zone, rice system, gender and age group.

Table 37: RICOWAS Results Framework

Result	Indicators	Baseline	Milestones (after 2 years)	End of project targets	Means of verification	Responsible Parties	Risks and Assumptions
Global Objective							
Improve climate resilience and increase rice system productivity of smallholder rice farmers across West Africa using a climate-resilient rice production approach	Number of direct CRRP beneficiaries	0	At least 70,000 CRRP direct beneficiaries (at least 30% women and youth)	At least 140,000 CRRP direct beneficiaries (at least 30% women and youth)	M&E reports	NEE all 13 countries, OSS, REE	**Assumptions:** Political stability and government commitment exists and is maintained Bio-safety constraints (COVID-19) do not /or only minimally impede project implementation Macro-economic environment and macro-infrastructure is supportive Major disruptive climatic events do not occur
	% rice yield increase with CRRP	0	25% yield increase	50% yield increase			
	Number of climate-resilient practices / technologies adopted	0	At least 06 CRRP practices/ technologies adopted	At least 12 CRRP practices/ technologies adopted			
COMPONENT 1: Strengthen human and institutional capacity in climate-resilient rice production (CRRP)							
Outcome 1.1. Climate change dimension in the regional Rice Offensive Strategy and the National Rice Development Strategies integrated	Number of National Rice Strategies (NRDS) part of the Rice Offensive having integrated climate change dimension	0	At least 5 of the 13 countries NRDS have integrated climate change dimension	All 13 countries have integrated climate change dimension in their NRDS	13 amended NRDS	NEE 13 countries, OSS, REE	**Assumption:** Amendment cycles of the NRDS coincide with RICOWAS timeline
Output 1.1.1. Climate change dimension and proposed actions integrated in the regional and national rice strategy documents	Number of studies	0 (for all)	08 studies completed	15 studies completed (Recommendations integrated in the 13 NRDS)	Study reports (13 NRDS Rice Offensive documents)	OSS, REE, NEE 13 countries	**Assumptions:** Amendment cycles of the NRDS coincide with RICOWAS timeline
	Number of national validation meetings		06 National validation meetings completed	13 National validation meetings completed	Workshop reports		
	Number of regional validation workshops		01 regional validation workshop completed	02 regional validation workshops completed	Workshop reports		
	% of women participation		More than 25% of participants are women	More than 35% of participants are women	Gender assessment and workshop reports	OSS, REE, NEE 13 countries	**Assumptions:** Women are engaged and available to participate in the discussions and are involved in the planning/strategic/ activities. Risk: Cultural perceptions are barrier/limits to women engagement
	Number of women interviewed		More than 25% of interviewed stakeholders are women/girls	More than 25% of interviewed stakeholders are women	Gender assessment and workshop reports	OSS, REE, NEE 13 countries	**Assumptions:** Assess number of women/girls are covered by the studies

							Risk: Cultural perceptions are barrier/limits to women involvement
Outcome 1.2. Key stakeholders operating in different climate zones and rice systems gained tools, knowledge and skills to successfully address climate-threats and implement CRRP in a sustainable way	Number of rice value-chain stakeholders increase capacity to scale-up CRRP	0 (for all)	26 researchers, 39 trainers and 13 NEE and 02 REE staff with strengthened capacity in CRRP	At least 52 researchers, 39 trainers and 26 NEE and 04 REE staff with strengthened capacity in CRRP	M&E and gender considerations reports	OSS, REE, NEE all 13 countries	**Assumptions:** Active participation of all stakeholder groups in project activities Timely release of project funds
	Number of institutions have their staff with increased capacity (gender disaggregated)		At least **2** institutions/country have improved capacity to scale-up CRRP (= total of 26 institutions)	At **least 5** institutions/country have improved capacity to scale-up CRRP (total of 65 institutions)			
	CRRP regional research group operational		26 members of the CRRP research group	The regional research group is operational			
Output 1.2.1. Capacity of national and regional research centers strengthened	Number of research projects implemented	0 (for all)	02 research projects completed/country (= total of 26)	04 research projects completed/country (= total of 52)	Published research papers on prototypes	OSS, REE, NEE all 13 countries	**Assumption:** Researchers and technical experts committed to CRRP research and technical guidelines development Timely release of project funds
	Number of training sessions conducted (gender disaggregated participation)		14 training sessions conducted More than 30% of participants are women	28 training sessions conducted More than 45% of participants are women	Training reports		
	Number of new training modules		6 training modules developed and published	12 training modules developed and published	Training modules		
	Number of scientific articles published		2 scientific articles published	8 scientific articles published	Articles published		
	Number of exchange workshops (gender disaggregated participation)		At least 10 exchange workshops More than 30% of participants are women	26 exchange workshops More than 45% of participants are women	Workshop reports		
Output 1.2.2. Institutional capacity of the regional and national executing entities for project implementation strengthened	Number of capacity needs assessment studies (gender disaggregated interviews)	0 (for all)	14 country and one regional capacity needs assessment	14 country and one regional capacity needs assessment	Capacity assessment study documents	OSS, REE, NEE all 13 countries	**Assumption:** Political stability and government commitment is high Timely release of project funds
	Number of regional technical workshops (gender disaggregated participation)		02 regional technical workshops	04 regional technical workshops	Workshop reports		
	Number of field exchange visits (gender disaggregated participation)		At least 01 field exchange visits/country (= total of 13) More than 30% of participants are women	At least 06 field exchange visits/country (= total of 78) More than 40% of participants are women	Trip reports		
	Number of data collection kits		13 data collection kits	13 data collection kits	Kits		
	Regional communication hub functional		01 operational regional communication hub	01 operational regional communication hub	operational regional communication hub		
	CRS-Riz advanced its status to CRE-Riz			CRE-Riz established	CORAF/WECARD Certificate		
Output 1.2.3. Extension institutions involved in the development and dissemination of SRI and CRRP strengthened	Number of regional TOT workshops (gender disaggregated participation)	0 (for all)	2 regional ToT workshops More than 30% of participants are women	4 regional ToT workshops More than 40% of participants are women	Training workshop reports	OSS, REE, NEE all 13 countries	**Assumption:** political and biosafety situations allow for regional training events
	Number of national trainings (gender disaggregated participation)		20 national trainings More than 30% of participants are women	52 national trainings More than 45% of participants are women	Training workshop reports		

	Number of trainers trained (gender disaggregated participation)		At least 39 trainers trained (at regional level) (3/country) More than 30% of participants are women	At least 39 trainers trained (at regional level) (3/country) More than 45% of participants are women	List of participants		
	Number of training modules produced		At least 5 training modules produced	At least 7 training modules produced	Training modules		
	Number of training kits (equipment, material)		7 training kits (equipment, material)	13 training kits (equipment, material)	Training materials, M&E reports		
COMPONENT 2. Assist farmers to scale-up CRRP							
Outcome 2.1. Smallholder rice farmers in the project zones successfully adopted SRI and CRRP practices, achieved higher rice productivity, and improved their incomes and livelihoods.	Number of farmers adopting CRRP	To be determined at project start (Baseline study)	At least 40,000 smallholder farmer beneficiaries adopt CRRP	At least 140,000 smallholder farmer beneficiaries adopt CRRP	M&E reports	OSS, REE, NEE all 13 countries	**Assumptions:** Commitment for efficient collaboration from all participating stakeholders Political and biosafety situations allow for project field implementation. Timely release of project funds
	Number of ha under CRRP		At least 25,000 ha under CRRP	At least 60,000 ha under CRRP			
	% Income increase with CRRP		At least 40% income increase with CRRP	At least 80% income increase with CRRP			
Output 2.1.1. Smallholder rice farmers in the project zones strengthened their livelihoods by reducing production costs and improving rice yields through the adoption of SRI and CRRP	Number of trainings for smallholder farmers (disaggregated by gender and youth)	To be determined at project start (Baseline study)	24 farmer trainings held/country	48 farmer trainings held/country	Field visits, Training materials, Equipment distribution reports, supervision, M&E reports and gender considerations	OSS, REE, NEE all 13 countries	**Assumptions:** Project zone areas are safe and accessible Trainings and technical support are provided in timely manner Commitment for efficient collaboration from all participating stakeholders
	Percentage of trained farmers (disaggregated by gender and youth)		At least 50% farmer trainers trained	At least 80% farmers trainers trained			
	Number of extension materials distributed		At least 5 extension material packages distributed	At least 7 extension material packages distributed			
	Percentage of farmers technically assisted in their fields (disaggregated by gender and youth)		At least 50% of farmers technically assisted in their fields	At least 80% of farmers technically assisted in their fields			
	Percentage of farmers producing rice seed and organic fertilizer		At least 20% of CRRP farmers produce rice seed and organic fertilizer	At least 60% of CRRP farmers produce rice seed and organic fertilizer			
	Percentage of farmers adopting SLWM practices in their fields		At least 30% of CRRP farmers adopt more than two SLWM practices in their fields	At least 80% of CRRP farmers adopt more than two SLWM practices in their fields			
	Number of local nurseries established (gender disaggregated property)		At least 200 of nurseries are created at the local level	At least 520 of nurseries are created at the local level			
	Number of local composting units (gender disaggregated property)		At least 100 of composting units are created at the local level	At least 260 of composting units are created at the local level			
	Number of equipment packages distributed to farmers /country (disaggregated by gender and youth beneficiaries)		7 equipment packages distributed to farmers /country More than 40% of participants are women/girls	13 equipment packages distributed to farmers /country More than 50% of participants are women/girls			
Output 2.1.2. Adopted SRI and CRRP practices by	M&E methodology established in first year	M&E system to be	M&E method functional	13 M&E experts are collecting data	M&E methodology, Baseline, Training	OSS, REE, NEE all 13 countries	**Assumptions:** Timely release of project

smallholder farmers are monitored, analyzed and the results widely shared	Data tracking mechanism established	developed at project start	Equipment for data tracking mechanism installed	Equipment for data tracking mechanism installed and operational	workshop reports, M&E reports		funds Political and biosafety situations allow for field monitoring and evaluation system to be implemented throughout the project period.
	Baseline study established		14 Baseline studies established	14 Baseline studies established			
	Number of training sessions on M&E system and data collection		30 training sessions on M&E system and data collection	67 training sessions on M&E system and data collection			
	Number of yearly M&E reports		2 yearly M&E reports by 13 NEE and the REE	4 yearly M&E reports by 13 NEE and the REE			
Outcome 2.2. Rice value chain strengthened through public-private partnerships (PPP) and agricultural associations and cooperatives, and thus improved the resilience of smallholder rice farmers to the harmful effects of climate change	Number of successful PPP partnerships with farmer organizations	0	At least 26 new PPP agreements established and functional (2 PPP/ country)	65 new PPP agreements established and functional (5 PPP/ country)	M&E reports	OSS, REE, NEE all 13 countries	**Assumptions:** Willingness of all identified stakeholders to collaborate and enter into partnership Identified equipment (e.g. for processing) is available for purchase Timely releases of project funds
	Additional benefits (US$) created based on project intervention	0	Total additional benefits (US$) from PPs (established at baseline)	Total additional benefits (US$) from PPPS (established at baseline)			
Output 2.2.1. Rice production and post-harvest components in the rice value-chain strengthened	Number of private sector partners engaged with/country (disaggregated by gender)	To be determined at baseline	3 private sector partners engaged with/country	6 private sector partners engaged with/country	PPP agreements, Meeting reports, M&E incl. gender assessments and reports	OSS, REE, NEE all 13 countries	**Assumptions:** Willingness of all identified stakeholders to collaborate and enter into partnership Identified equipment (e.g. for processing) is available for purchase Timely releases of project funds
	Number of stakeholder meetings held (disaggregated by gender)		4 Number of stakeholder meetings held/country	10 Number of stakeholder meetings held/country			
	Number of capacities strengthening workshops held (disaggregated by gender)		3 capacity strengthening workshops held/country More than 35% of participants are women	6 capacity strengthening workshops held/country More than 35% of participants are women			
	Number of direct beneficiaries from PPP partnerships (disaggregated by gender)		At least 30 direct beneficiaries from PPP partnerships/ country More than 35% of beneficiaries are women	At least 80 direct beneficiaries from PPP partnerships/ country More than 35% of beneficiaries are women			
	Number of PPP supported with equipment (disaggregated by gender)		At least 26 PPP supported with equipment More than 35% of beneficiaries are women	65 PPP supported with equipment More than 45% of beneficiaries are women			
Output 2.2.2. Agricultural associations and cooperatives in the rice value chain strengthened in their operations	Number of newly formalized FOs (disaggregated by gender)	0 (for all)	At least 3 new FOs formalized/country	At least 6 new FOs formalized/country	FO meeting reports, Training reports and list of presence, Training modules, Legal documentation of new FO, M&E and reports with gender considerations	OSS, REE, NEE all 13 countries	**Assumptions:** Farmer organizations committed to participate in project Political stability, biosafety and economic opportunities exist for FO to invest in rice value chain.
	Number of business plans developed (disaggregated by gender)		2 business plans developed/ country	5 business plans developed/ country			
	Number of trainings to farmer organizations (FO) (disaggregated by gender)		At least 4 trainings to FO /country (=total of 52 trainings) More than 40% of beneficiaries are women	10 trainings to FO /country (=total of 130 trainings) More than 50% of beneficiaries are women			
	Number of assisted FOs to access credit and subsidies (disaggregated by gender)		At least 02 credits accessed by FOs/country	At least 06 credits accessed by FOs/country			
COMPONENT 3. Strengthen communication, advocacy and partnerships to scale-up CRRP							
	Number of knowledge-products disseminated	0 (for all)	At least 60 knowledge-products disseminated	At least 120 knowledge-products disseminated	M&E reports	OSS, REE, NEE all 13 countries	**Assumptions:**

Outcome 3.1. Awareness and knowledge of CRRP in West Africa greatly increased			(4*13 countries plus 8 regional)	(8*13 countries plus 16 regional)			Stakeholders' interest and political momentum for climate-resilient rice production increases in time. Timely releases of project funds
	Number of knowledge-sharing events held		28 knowledge sharing events held and participated in	at least 70 knowledge sharing events held and participated in			
Output 3.1.1. Knowledge and awareness materials developed and widely disseminated, in response to the demand and needs of different stakeholder groups	Communication strategy (national and regional level) (gender disaggregated reach)	0 (for all)	1 regional and 13 national communication strategies More than 50% of beneficiaries are women/Youth	1 regional and 13 national communication strategies More than 50% of beneficiaries are women/Youth	Communication strategy, Electronic files of documents, videos, radio shows, social media posts, Project website address, Workshop reports, Policy briefs, M&E reports, Field visits reports	OSS, REE, NEE all 13 countries	**Assumptions:** Stakeholders' interest and political momentum for climate-resilient rice production increases in time Timely releases of project funds
	Number of knowledge-products produced (gender disaggregated reach)		At least 4 knowledge products produced per country (=total of 52). At least 8 knowledge products produced at regional level More than 50% of beneficiaries are women/Youth	At least 8 knowledge products produced per country (=total of 104) At least 16 knowledge products produced at regional level More than 50% of beneficiaries are women/Youth			
	Project portal functional with regular postings and updates		01 Project portal developed	01 Project portal operational			
	Number of field visits organized (disaggregated by gender)		02 field visits organized/country More than 35% of participants are women/youth	At least 05 field visits organized/country More than 45% of participants are women/youth			
	Number of policy briefs written and disseminated (gender disaggregated reach)		1 regional policy brief More than 50% of beneficiaries are women/Youth	13 national policy briefs 3 regional policy briefs More than 50% of beneficiaries are women/Youth			
Outcome 3.2. Partnerships and coordination strengthened to enable the mainstreaming of CRRP in West Africa.	Number of newly formulated partnerships to scale-up CRRP	0 (for all)	2 new regional partnerships established	5 new regional partnerships established	M&E reports	OSS, REE, NEE all 13 countries	**Assumptions:** Partner willingness and support, and political momentum for climate-resilient rice production increases in time. Timely releases of project funds
	Number of partner activities to scale-up CRRP		2 collaborative activities /country (=26 total)	5 collaborative activities /country (=65 total)			
Output 3.2.1. Synergies among partners established to mainstream CRRP in West Africa	Number coalition building meetings(disaggregated by gender)	To be determined at project start (baseline)	4 coalition building meetings More than 35% of participants are women/youth	Total of 8 coalition building meetings More than 45% of participants are women/youth	Meeting reports, Workshop reports, Electronic files of presentations, M&E reports	OSS, REE, NEE all 13 countries	**Assumptions:** Partner willingness and support, and political momentum for climate-resilient rice production increases in time. Timely releases of project funds
	Number of people participating to international events (disaggregated by gender)		3 people participate in 2 international events	9 people participate in 4 international events			
	National CRRP network functional (disaggregated by gender)		13 national CRRP networks	13 national CRRP networks			

Adaptation Fund Core indicators for the project:

275. **Three** Adaption Fund Core Indicators will be monitored for the project as per below:

Table 38: Core Indicators for the RICOWAS project

	Baseline	Target at project approval
Direct beneficiaries supported by the project	0	140,000
Female direct beneficiaries	0	42,000
Youth direct beneficiaries	0	56,000
Indirect beneficiaries supported by the project	0	1,500,000
Female indirect beneficiaries	0	450,000
Youth indirect beneficiaries	0	600,000
	Baseline	**Target at project approval**
Sector (Component 2) Drought and climate change adaptation actions		
Targeted Asset 1) Health and Social Infrastructure *(developed/improved)* i) *IGAs* ii) *Provision of Small competitive grants* 2) Physical asset *(produced/improved/strengthened)* *i) Innovative water harvesting and storage infrastructure produced* *ii) Mini-irrigation and delivery system produced* *iii) Water wells improved* **iv)** *Groundwater sources improved* **v)** *Agrosilvopastoral system improved* **vi)** *Climate smart agricultural infrastructure*		
Changes in Asset *(Quantitative or qualitative depending on the asset)* **1)** Health and Social Infrastructure *(developed/improved)* **2)** *IGAs developed and credits provided*	Countries differ by their scaling up of SRI-CRRP strategies through the number of communes covered (Senegal 102, Ghana 54, Sierra Leone-Liberia-Côte d'Ivoire between 38 and 32, Niger 9, Guinea 6 etc.) and the targeted rice farmers (more than 13, 000 in Mali, Sierra Leone, Senegal, Ghana and Nigeria, 3 392 in Côte d'Ivoire etc.).	12 CRRP practices adopted /country 50% yield increase with CRRP
2) Physical asset *(produced/improved/strengthened)*		
i) Innovative water harvesting and storage infrastructure produced		
ii) Mini-irrigation and delivery system produced		
iii) Water wells improved		
iv) Groundwater sources improved		
v) Agro-silvopastoral system improved		
vi) Climate smart agricultural infrastructure produced		
	Baseline	**Target at project approval**
Household income targets: i) Total number of households ii) Number of households with increase in income	 0 0	 140,000 140,000
Number of households i) Total number of households targeted with trainings and adaptation action (Component 2)	0	140,000
Income Source: i) Number of households that have gained at least one additional income stream	0	70,000

F. Alignment with the Results Framework of Adaptation Fund

Table 39: RICOWAS alignment with AF results Framework

Project Objective(s)[30]	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Improve climate resilience and increase rice system productivity of smallholder rice farmers across West Africa using a climate-resilient rice production approach	Number of direct CRRP beneficiaries	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	**11,799,000**
		Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	
			3.2. Percentage of targeted population applying appropriate adaptation responses	
		Outcome 7: Improved policies and regulations that promote and enforce resilience measures	7. Climate change priorities are integrated into national development strategy	
	% rice yield increase with CRRP	Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets	4.1. Responsiveness of development sector services to evolving needs from changing and variable climate	
			4.2. Physical infrastructure improved to withstand climate change and variability-induced stress	
		Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.1 Percentage of households and communities having more secure access to livelihood assets	
			6.2. Percentage of targeted population with sustained climate-resilient alternative livelihoods	
	Number of climate-resilient practices / technologies adopted	Outcome 8: Support the development and diffusion of innovative adaptation practices, tools and technologies	8. Innovative adaptation practices are rolled out, scaled up, encouraged and/or accelerated at regional, national and/or subnational level	
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**
Outcome 1.1 Climate change dimension in the regional Rice Offensive Strategy and the National Rice Development Strategies integrated	Number of National Rice Strategies (NRDS) part of the Rice Offensive having integrated climate change dimension	Output 7: Improved integration of climate-resilience strategies into country development plans	7.1. No. of policies introduced or adjusted to address climate change risks (by sector)	**300,000**
			7.2. No. of targeted development strategies with incorporated climate change priorities enforced	
Outcome 1.2 Key stakeholders operating in different climate zones and rice	Number of rice value-chain stakeholders	***Output 6:*** Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1.1. No. and type of adaptation assets (tangible and intangible) created or strengthened in support of individual or community livelihood strategies	**1,348,500**

[30] The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

systems gained tools, knowledge and skills to successfully address climate-threats and implement CRRP in a sustainable way	increase capacity to scale-up CRRP			
	Number of institutions/countries with improved capacities to scale-up CRRP	***Output 2.1***: Strengthened capacity of national and sub-national centers and networks to respond rapidly to extreme weather events	2.1.2 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale)	
	CRRP regional research group operational	***Output 3.2:*** Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.1 No. of technical committees/associations formed to ensure transfer of knowledge	
Outcome 2.1 Smallholder rice farmers in the project zones successfully adopted SRI and CRRP practices, achieved higher rice productivity, and improved their incomes and livelihoods	Number of farmers adopting CRRP	***Output 6:*** Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1.1. No. and type of adaptation assets (tangible and intangible) created or strengthened in support of individual or community livelihood strategies	**7,198,000**
	Number of ha under CRRP	***Output 8:*** Viable innovations are rolled out, scaled up, encouraged and/or accelerated.	8.1. No. of innovative adaptation practices, tools and technologies accelerated, scaled-up and/or replicated	
	% Income increase with CRRP	***Output 6:*** Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.2.1. Type of income sources for households generated under climate change scenario	
Outcome 2.2 Rice value chain strengthened through public-private partnerships (PPP) and agricultural associations and cooperatives, and thus improved the resilience of smallholder rice farmers to the harmful effects of climate change	Number of successful PPP partnerships with farmer organizations	***Output 4:*** Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	4.1.1. No. and type of development sector services modified to respond to new conditions resulting from climate variability and change (by sector and scale)	**1,922,500**
			4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale)	
	Additional benefits (US$) created based on project intervention	***Output 6:*** Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1.1 No. and type of adaptation assets (tangible and intangible) created or strengthened in support of individual or community livelihood strategies	
Outcome 3.1 Awareness and knowledge of CRRP in West Africa greatly increased	Number of knowledge-products disseminated	***Output 3.2:*** Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders	**515,000**
	Number of knowledge-sharing events held			
Outcome 3.2 Partnerships and coordination strengthened to enable the mainstreaming of CRRP in West Africa	Number of newly formulated partnerships to scale-up CRRP	***Output 3.2:*** Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.1 No. of technical committees/associations formed to ensure transfer of knowledge	**515,000**
	Number of partner activities to scale-up CRRP			

G. Detailed budget (US$)

Table 40: RICOWAS Detailed budget

Components/Outcomes/ Outputs/Activities	Regional	Benin	Burkina Faso	Côte d'Ivoire	The Gambia	Ghana	Guinea	Liberia	Mali	Niger	Nigeria	Senegal	Sierra Leone	Togo	Total Budget	Budget notes activities
Component 1: Strengthen human and institutional capacity in climate-resilient rice production (CRRP)	**$ 498 000**	**$ 88 500**	**$ 88 500**	**$ 88 500**	**$ 88 500**	**$ 88 500**	**$ 88 500**	**$ 88 500**	**$ 88 500**	**$ 88 500**	**$ 88 500**	**$ 88 500**	**$ 88 500**	**$ 88 500**	**$1 648 500**	
Outcome 1.1. Climate change dimension in the regional Rice Offensive Strategy and the National Rice Development Strategies integrated	**$ 170 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 300 000**	
Output 1.1.1. Climate change dimension and proposed actions integrated into the regional and national rice strategy documents	**$ 170 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 300 000**	
Activity 1.1.1.1. Analysis of climate change impacts on rice production in West Africa	**$ 30 000**														**$ 30 000**	International consultant @36-man days @ USD 700/day and associated costs @USD 4,800
Activity 1.1.1.2. Regional validation workshop and dissemination of the regional study	**$ 52 500**														**$ 52 500**	Regional workshop @ 50,000 and associated costs @USD 2,500
Activity 1.1.1.3. Development of rice sector adaptation action plans for climate change to be integrated to the Rice Offensive Strategy (ROS)	**$ 35 000**														**$ 35 000**	International consultant @43-man days @ USD 700/day and associated costs @USD 5,000
Activity 1.1.1.4. Regional validation workshops and dissemination of the rice sector adaptation plan	**$ 52 500**														**$ 52 500**	Regional workshop @ 50,000 and associated costs @USD 2,500
Activity 1.1.1.5. Development and dissemination of rice sector briefs and methodologies to integrate climate change adaptation to rice value chain		**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 10 000**	**$ 130 000**	National consultant @20-man days @ USD 350/day = USD 7,000/country and associated costs @USD 3,000/per country
Outcome 1.2. Key stakeholders operating in different climate zones and rice systems gained tools, knowledge and skills to successfully address climate-threats and implement CRRP in a sustainable way	**$ 328 000**	**$ 78 500**	**$ 78 500**	**$ 78 500**	**$ 78 500**	**$ 78 500**	**$ 78 500**	**$ 78 500**	**$ 78 500**	**$ 78 500**	**$ 78 500**	**$ 78 500**	**$ 78 500**	**$ 78 500**	**$1 348 500**	
Output 1.2.1. Capacity of national and regional research centers strengthened	**$ 127 000**	**$ 15 000**	**$ 15 000**	**$ 15 000**	**$ 15 000**	**$ 15 000**	**$ 15 000**	**$ 15 000**	**$ 15 000**	**$ 15 000**	**$ 15 000**	**$ 15 000**	**$ 15 000**	**$ 15 000**	**$ 322 000**	
Activity 1.2.1.1. Support the development of SRI-CRRP adapted rice growing practices, equipment and tools	**$ 67 000**	**$ 11 000**	**$ 11 000**	**$ 11 000**	**$ 11 000**	**$ 11 000**	**$ 11 000**	**$ 11 000**	**$ 11 000**	**$ 11 000**	**$ 11 000**	**$ 11 000**	**$ 11 000**	**$ 11 000**	**$ 210 000**	International consultant @25-man days @ USD 600/day **I** 2 Regional training workshops @ USD 25,000/Workshop and associated costs @ USD 2,000 I 26 National training workshops (2/country) @ USD 5,000/Workshop and associated costs @ USD 1,000/country
Activity 1.2.1.2. Establishment of a regional technical group to review the advancement of SRI and CRRP best practices	**$ 60 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 112 000**	International consultant (*operating manual of the regional technical group)* @ 15-man days @ USD 600 I 2 Regional exchange workshops @ USD 25,000/workshop and associated costs @ USD 1,000 **I** National exchange workshops or meetings @ USD 4,000 / country
Output 1.2.2. Institutional capacity of the regional and national executing entities for project implementation strengthened	**$ 78 000**	**$ 29 500**	**$ 29 500**	**$ 29 500**	**$ 29 500**	**$ 29 500**	**$ 29 500**	**$ 29 500**	**$ 29 500**	**$ 29 500**	**$ 29 500**	**$ 29 500**	**$ 29 500**	**$ 29 500**	**$ 461 500**	
Activity 1.2.2.1. Undertake capacity needs assessment	**$ 23 000**	**$ 4 500**	**$ 4 500**	**$ 4 500**	**$ 4 500**	**$ 4 500**	**$ 4 500**	**$ 4 500**	**$ 4 500**	**$ 4 500**	**$ 4 500**	**$ 4 500**	**$ 4 500**	**$ 4 500**	**$ 81 500**	International consultant @30-man days @ USD 600 and associated costs @USD 5,000 I National consultation assessed @15-man days @ USD 300

Activity 1.2.2.2. Undertake demonstration field visits at national and regional level to share and exchange good practices		$ 10 000	$ 10 000	$ 10 000	$ 10 000	$ 10 000	$ 10 000	$ 10 000	$ 10 000	$ 10 000	$ 10 000	$ 10 000	$ 10 000	$ 10 000	$ 130 000	Field Visits @ USD 10,000/country
Activity 1.2.2.3. Acquisition of necessary logistics material to support field implementation		$ 15 000	$ 15 000	$ 15 000	$ 15 000	$ 15 000	$ 15 000	$ 15 000	$ 15 000	$ 15 000	$ 15 000	$ 15 000	$ 15 000	$ 15 000	$ 195 000	Logistics material for data collection @ USD 15,000/country
Activity 1.2.2.4. Support the process of upscaling the REE and strengthening its capacities to promote CRRP-SRI in the region	$ 55 000														$ 55 000	International consultant @25-man days @ USD 600 I Strengthening of the capacities of REE @ 40,000 USD (equipment, consultant...)
Output 1.2.3. Extension institutions involved in the development and dissemination of SRI and CRRP strengthened	$ 123 000	$ 34 000	$ 34 000	$ 34 000	$ 34 000	$ 34 000	$ 34 000	$ 34 000	$ 34 000	$ 34 000	$ 34 000	$ 34 000	$ 34 000	$ 34 000	$ 565 000	
Activity 1.2.3.1. Undertake Training-of-Trainer's (ToT) on SRI, CRRP	$ 100 000	$ 19 000	$ 19 000	$ 19 000	$ 19 000	$ 19 000	$ 19 000	$ 19 000	$ 19 000	$ 19 000	$ 19 000	$ 19 000	$ 19 000	$ 19 000	$ 347 000	ToT workshops: 4 Regional training workshops @ USD 25,000/workshop I 52 National training workshops (4/country) @ USD 4,500/workshop and associated costs @ USD 1,000/country
Activity 1.2.3.2. Develop, revise and produce training materials and modules for SRI, SLWM and other relevant technical topics	$ 23 000	$ 3 000	$ 3 000	$ 3 000	$ 3 000	$ 3 000	$ 3 000	$ 3 000	$ 3 000	$ 3 000	$ 3 000	$ 3 000	$ 3 000	$ 3 000	$ 62 000	International consultant @35-man days *(20 days/year one I 15 days/year three)* and associated costs @ USD 2,000@ USD 600 I Printing and translation services estimated @ USD 3,000/Country
Activity 1.2.3.3. Support farmer field implementation of CRRP by extension institutions with adequate materials and resources		$ 12 000	$ 12 000	$ 12 000	$ 12 000	$ 12 000	$ 12 000	$ 12 000	$ 12 000	$ 12 000	$ 12 000	$ 12 000	$ 12 000	$ 12 000	$ 156 000	Logistics material @ USD 12,000/country
COMPONENT 2. Assist farmers to scale-up CRRP	$ 274 200	$ 680 500	$ 680 500	$ 680 500	$ 680 500	$ 680 500	$ 680 500	$ 680 500	$ 680 500	$ 680 500	$ 680 500	$ 680 500	$ 680 500	$ 680 500	$9 120 500	
Outcome 2.1. Smallholder rice farmers in the project zones successfully adopted SRI and CRRP practices, achieved higher rice productivity, and improved their incomes and livelihoods.	$ 217 000	$ 537 000	$ 537 000	$ 537 000	$ 537 000	$ 537 000	$ 537 000	$ 537 000	$ 537 000	$ 537 000	$ 537 000	$ 537 000	$ 537 000	$ 537 000	$7 198 000	
Output 2.1.1. Smallholder rice farmers in the project zones strengthened their livelihoods by reducing production costs and improving rice yields through the adoption of SRI and CRRP		$ 491 000	$ 491 000	$ 491 000	$ 491 000	$ 491 000	$ 491 000	$ 491 000	$ 491 000	$ 491 000	$ 491 000	$ 491 000	$ 491 000	$ 491 000	$6 383 000	
Activity 2.1.1.1. Support the adoption and scaling-up of best practices of SRI in farmers' fields		$ 100 000	$ 100 000	$ 100 000	$ 100 000	$ 100 000	$ 100 000	$ 100 000	$ 100 000	$ 100 000	$ 100 000	$ 100 000	$ 100 000	$ 100 000	$1 300 000	Cost field training, assisting and advising farmers directly in their fields @ USD 100,000/country (*@USD 25,000/year/country)* **Includes Implementation of ESMP (USP E&S screening)*
Activity 2.1.1.2. Promote and assist farmers in executing SLWM practices in association with their SRI fields		$ 80 000	$ 80 000	$ 80 000	$ 80 000	$ 80 000	$ 80 000	$ 80 000	$ 80 000	$ 80 000	$ 80 000	$ 80 000	$ 80 000	$ 80 000	$1 040 000	Costs of implementing SLWN practices on the fields @ USD 80,000/country (@USD 20,000/year/country) **Includes Implementation of ESMP (USP E&S screening)*
Activity 2.1.1.3. Promote and assist farmers in rice seed, rice seedling and organic fertilizer production		$ 135 000	$ 135 000	$ 135 000	$ 135 000	$ 135 000	$ 135 000	$ 135 000	$ 135 000	$ 135 000	$ 135 000	$ 135 000	$ 135 000	$ 135 000	$1 755 000	Setup of nurseries (equipment, seeds etc.) @ USD 2,000 / nursery (40 nurseries/country I Setup of composting units (raw materials, equipment) @ USD 2,500/unit (20 units/country) I Support and accompaniment costs for the setting up of nurseries and composting units @ 3,000/country I Associated costs @ 2,000/country **Includes Implementation of ESMP (USP E&S screening)*

Activity 2.1.1.4. Provide farmers with technical expertise to implement best practices for CRRP		**$ 36 000**	**$ 36 000**	**$ 36 000**	**$ 36 000**	**$ 36 000**	**$ 36 000**	**$ 36 000**	**$ 36 000**	**$ 36 000**	**$ 36 000**	**$ 36 000**	**$ 36 000**	**$ 36 000**	**$ 468 000**	National consultant @ 30-man days (15 days/year one I 15 days/year three) @ USD 300 | Printing and translation and associated costs @ USD 3,000/year = USD 12,000/country | Organization of information campaigns and sensitization days for rice farmers @ USD 15,000/country
Activity 2.1.1.5. Provide farmers access to equipment and tools to implement SRI-CRRP		**$ 140 000**	**$ 140 000**	**$ 140 000**	**$ 140 000**	**$ 140 000**	**$ 140 000**	**$ 140 000**	**$ 140 000**	**$ 140 000**	**$ 140 000**	**$ 140 000**	**$ 140 000**	**$ 140 000**	**$1 820 000**	Buy and distribute equipment and tools @ USD 140,000/country (@USD 35,000/year/country) **Includes Implementation of ESMP (USP E&S screening)*
Output 2.1.2. SRI and CRRP practices - adopted by smallholders in the project zones - monitored, analyzed and the results widely shared	**$ 217 000**	**$ 46 000**	**$ 46 000**	**$ 46 000**	**$ 46 000**	**$ 46 000**	**$ 46 000**	**$ 46 000**	**$ 46 000**	**$ 46 000**	**$ 46 000**	**$ 46 000**	**$ 46 000**	**$ 46 000**	**$ 815000**	
Activity 2.1.2.1. Develop and test data tracking methodology and mechanism on the implementation of SRI and CRRP	**$ 90 000**														**$ 90 000**	International consultant @ 80 man-days @ USD 600 I Equipment, licenses and associated costs @ USD 42,000
Activity 2.1.2.2. Implement the baseline study on rice production and value-chain characteristics	**$ 40 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 144 000**	International consultant @ 50-man days @ USD 600 and associated costs @ USD 10,000 I National consultant @20-man days @ USD 300/day and associated costs of USD 2,000/country
Activity 2.1.2.3. Provide agents of national institutions and extension services, researchers and smallholder rice farmers with the expertise to use the data tracking methodology	**$ 50 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 336 000**	2 regional training workshops @ USD 25,000/Workshop I 5 national training workshops/country @ USD 4,000/Workshop and associated costs @ USD 2,000/country
Activity 2.1.2.4. Update the data analysis and CRRP tracking database annually and publish its key performance indicators and results on the project website	**$37 000**	**$16 000**	**$16 000**	**$16 000**	**$16 000**	**$16 000**	**$16 000**	**$16 000**	**$16 000**	**$16 000**	**$16 000**	**$16 000**	**$16 000**	**$16 000**	**$245 000**	International consultant @ 20-man days @ USD 600 I half-yearly monitoring @ USD 2,000 / country I Regional workshop @ USD 25,000
Outcome 2.2. Rice value chain strengthened through public-private partnerships (PPP) and agricultural associations and cooperatives, and thus improved the resilience of smallholder rice farmers to the harmful effects of climate change	**$ 57 000**	**$ 143 500**	**$ 143 500**	**$ 143 500**	**$ 143 500**	**$ 143 500**	**$ 143 500**	**$ 143 500**	**$ 143 500**	**$ 143 500**	**$ 143 500**	**$ 143 500**	**$ 143 500**	**$ 143 500**	**$1 922 500**	
Output 2.2.1. Rice production and post-harvest components in the rice value-chain strengthened	**$ 347 000**	**$ 77 000**	**$ 77 000**	**$ 77 000**	**$ 77 000**	**$ 77 000**	**$ 77 000**	**$ 77 000**	**$ 77 000**	**$ 77 000**	**$ 77 000**	**$ 77 000**	**$ 77 000**	**$ 77 000**	**$1 035 000**	
Activity 2.2.1.1. Establish networks and create partnerships between private companies and producer cooperatives	**$ 34 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$138 000**	International consultant @ 10-man days @ USD 600 and regional networking workshops @ USD 25,000 and associated costs @ USD 3,000 I National consultant @ 10-man days @ USD 300 I 1 national meeting/country @ USD 4,000 and associated costs @ USD 1,000/country
Activity 2.2.1.2. Generate PPP for the development and supply of innovative agricultural equipment and their provision to farmers		**$ 26 000**	**$ 26 000**	**$ 26 000**	**$ 26 000**	**$ 26 000**	**$ 26 000**	**$ 26 000**	**$ 26 000**	**$ 26 000**	**$ 26 000**	**$ 26 000**	**$ 26 000**	**$ 26 000**	**$338 000**	Agriculture equipment @ USD 22,000/country I Package for holding meetings or workshops/country @ USD 3,000 and associated costs @ USD 1,000 **Includes Implementation of ESMP (USP E&S screening)*
Activity 2.2.1.3. Generate PPP for threshing, processing, packaging and marketing of climate-resilient rice for vulnerable groups		**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 22 000**	**$ 286 000**	Processing equipment @ USD 18,000/country I Package for holding meetings or workshops/country @ USD 3,000 and associated costs @ USD 1,000 **Includes Implementation of ESMP (USP E&S screening)*

Activity 2.2.1.4. Generate PPPs for the supply of organic fertilizers and rice seeds produced by smallholder farmers		$ 21 000	$ 21 000	$ 21 000	$ 21 000	$ 21 000	$ 21 000	$ 21 000	$ 21 000	$ 21 000	$ 21 000	$ 21 000	$ 21 000	$ 21 000	$ 273 000	Storage equipment @ USD 17,000/country I Package for holding meetings or workshops/country @ USD 3,000 and associated costs @ USD 1,000 **Includes Implementation of ESMP (USP E&S screening)*
Output 2.2.2. Agricultural associations and cooperatives in the rice value chain strengthened in their operations	**$ 23 000**	**$ 66 500**	**$ 66 500**	**$ 66 500**	**$ 66 500**	**$ 66 500**	**$ 66 500**	**$ 66 500**	**$ 66 500**	**$ 66 500**	**$ 66 500**	**$ 66 500**	**$ 66 500**	**$ 66 500**	**$ 887 500**	
Activity 2.2.2.1. Reinforce and assist in the establishment of agricultural associations and cooperatives	**$ 23 000**	**$ 16 500**	**$ 16 500**	**$ 16 500**	**$ 16 500**	**$ 16 500**	**$ 16 500**	**$ 16 500**	**$ 16 500**	**$ 16 500**	**$ 16 500**	**$ 16 500**	**$ 16 500**	**$ 16 500**	**$ 237 500**	International consultant *(developing a general methodology and training modules)* @ 35 man-days @ USD 600 and associated costs @ USD 2,000 I National consultant (*mapping associations and cooperatives)* @ 15 man-days @ USD 300 / country I Capacity building workshops for the selected associations and cooperatives @ USD 3,000/workshop (4 workshops/country)
Activity 2.2.2.2. Provide and reinforce advisory services to agricultural associations and cooperatives		**$ 30 000**	**$ 30 000**	**$ 30 000**	**$ 30 000**	**$ 30 000**	**$ 30 000**	**$ 30 000**	**$ 30 000**	**$ 30 000**	**$ 30 000**	**$ 30 000**	**$ 30 000**	**$ 390 000**	Local training workshops *(10 per country)* @ USD 3,000/workshop
Activity 2.2.2.3. Provide assistance to agricultural associations and cooperative in accessing and managing agricultural credits and subsidies		**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 260 000**	National consultant @ USD 20,000 / country *(assist 10 cooperatives or associations/country @ USD 2,000/cooperative)*
COMPONENT 3. Strengthen communication, advocacy and partnerships to scale-up CRRP	**$ 113 500**	**$ 70 500**	**$ 70 500**	**$ 70 500**	**$ 70 500**	**$ 70 500**	**$ 70 500**	**$ 70 500**	**$ 70 500**	**$ 70 500**	**$ 70 500**	**$ 70 500**	**$ 70 500**	**$1 030 000**	
Outcome 3.1. Awareness and knowledge of CRRP in West Africa greatly increased	**$ 92 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 515 000**	
Output 3.1.1. Knowledge and awareness materials developed and widely disseminated	**$ 92 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 32 500**	**$ 515 000**	
Activity 3.1.1.1. Development of a communication strategy and plan	**$ 14 500**	**$ 5 500**	**$ 5 500**	**$ 5 500**	**$ 5 500**	**$ 5 500**	**$ 5 500**	**$ 5 500**	**$ 5 500**	**$ 5 500**	**$ 5 500**	**$ 5 500**	**$ 5 500**	**$ 86 000**	International consultant @20-man days @ USD 600/day and associated costs @ USD 2,500 National consultant @ 15-man days @ 300/day and associated costs @ USD 1,000/country
Activity 3.1.1.2. Development of a user-friendly web-based platform for SRI and CRRP methods	**$ 30 000**													**$ 30 000**	International consultant @ 45-man days @ USD 600/day and associated costs @ USD 3,000
Activity 3.1.1.3. Production of documents, videos, radio shows, maps.	**$ 18 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 4 000**	**$ 70 000**	Package for REE @ USD 15,000 Package for NEE @ USD 4,000
Activity 3.1.1.4. Organization of knowledge-sharing events and exchange visits at local, national, regional and global level including Asia, Latin America and other parts of Africa.	**$ 30 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 290 000**	Package for REE @ USD 30,000 Package for NEE @ USD 20,000
Activity 3.1.1.5. Writing, dissemination and presentation of policy and advocacy briefs on climate adaptation strategies and project impact for rice production and its role in adapting to climate change.		**$ 3 000**	**$ 3 000**	**$ 3 000**	**$ 3 000**	**$ 3 000**	**$ 3 000**	**$ 3 000**	**$ 3 000**	**$ 3 000**	**$ 3 000**	**$ 3 000**	**$ 3 000**	**$ 39 000**	Package for REE @ USD 10,000 Package for NEE @ USD 3,000
Outcome 3.2. Partnerships and coordination strengthened to enable the mainstreaming of CRRP in West Africa.	**$ 21 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 515 000**	
Output 3.2.1. Synergies among partners established to mainstream CRRP in West Africa	**$ 21 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 38 000**	**$ 515 000**	
Activity 3.2.1.1. Setting up of operational mechanisms for	**$ 21 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 125 000**	International consultant @ 20-man days @ USD 600 and Package for REE @

information-sharing, networking, and coalition-building for the scaling-up of CRRP																USD 9,000 I Package for NEE @ USD 8,000
Activity 3.2.1.2. Development of national networks that integrate all SRI and CRRP activities.		**$ 12 000**	**$ 12 000**	**$ 12 000**	**$ 12 000**	**$ 12 000**	**$ 12 000**	**$ 12 000**	**$ 12 000**	**$ 12 000**	**$ 12 000**	**$ 12 000**	**$ 12 000**	**$ 12 000**	**$ 156 000**	National consultant @ 10-man days @ 300/day and associated costs @ USD 1,000/country I Package for NEE @ USD 8,000
Activity 3.2.1.3. Organization of annual national events on rice and its linkage with climate change in West Africa		**$ 18 000**	**$ 18 000**	**$ 18 000**	**$ 18 000**	**$ 18 000**	**$ 18 000**	**$ 18 000**	**$ 18 000**	**$ 18 000**	**$ 18 000**	**$ 18 000**	**$ 18 000**	**$ 18 000**	**$ 234 000**	Package for NEE @ USD 18,000
Subtotal All Components	**$ 885 500**	**$ 839 500**	**$ 839 500**	**$ 839 500**	**$ 839 500**	**$ 839 500**	**$ 839 500**	**$ 839 500**	**$ 839 500**	**$ 839 500**	**$ 839 500**	**$ 839 500**	**$ 839 500**	**$ 839 500**	**$11 799 000**	
Project Execution Costs 9,5%	**$ 136 701**	**$ 75 708**	**$ 75 708**	**$ 75 708**	**$ 75 708**	**$ 75 708**	**$ 75 708**	**$ 75 708**	**$ 75 708**	**$ 75 708**	**$ 75 708**	**$ 75 708**	**$ 75 708**	**$ 75 708**	**$ 1 120 905**	
Project inception launch activities	**$ 59 000**														**$ 59 000**	Consultancies, workshop and travel costs to be covered by REE(@ USD 20,000/REE @ USD 3,000/country)
Project coordination and management fees	**$ 32 000**	**$ 32 000**	**$ 32 000**	**$ 32 000**	**$ 32 000**	**$ 32 000**	**$ 32 000**	**$ 32 000**	**$ 32 000**	**$ 32 000**	**$ 32 000**	**$ 32 000**	**$ 32 000**	**$ 32 000**	**$ 448 000**	Salaries and management fees (M&E, safeguards compliance (AF/OSS), gender and communication), Staffing costs, and project related activity expenditures (Monitoring and evaluation costs; Costs related to drafting progress reports and financial reports
Operating costs	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 20 000**	**$ 280 000**	Travel, DSA, printing, support staff, steering committee/other meetings
Equipment	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 8 000**	**$ 112 000**	IT Equipment
Monitoring & Evaluation	**$ 17 701**	**$ 15 708**	**$ 15 708**	**$ 15 708**	**$ 15 708**	**$ 15 708**	**$ 15 708**	**$ 15 708**	**$ 15 708**	**$ 15 708**	**$ 15 708**	**$ 15 708**	**$ 15 708**	**$ 15 708**	**$ 221 905**	Consultancies and travel : Costs related to drafting progress reports and financial reports ; Consultation with project stakeholders (meetings, workshops) ;
Total Project Costs	**$ 1 022 201**	**$ 915 208**	**$ 915 208**	**$ 915 208**	**$ 915 208**	**$ 915 208**	**$ 915 208**	**$ 915 208**	**$ 915 208**	**$ 915 208**	**$ 915 208**	**$ 915 208**	**$ 915 208**	**$ 915 208**	**$ 12 919 905**	
Project Implementation Costs 8,34%															**$ 1 080 095**	
Implementation and Coordination Management Fees : Salaries and fees of experts in charge of the project overall supervision, planning, daily management, implementation, compliance (ESP and GP), M&E, Communication and Gender advisor, Consultancies															**$ 660 095**	Salaries and Management fees
Equipment – USD25,000 Supervision and travel expenses for M&E - USD 80,000 Mid-term evaluation – USD30,000 Final project audit – USD 20,000 Final project evaluation– USD 30,000 Participation in workshops and steering committee meetings – USD 35,000															**$ 220 000**	Annual Field visits for M&E, ESMP Monitoring, quality assurance and joint review of the project results, progress and activities and financial reporting, Mid-term evaluation, Final Project report, Final project audit, Final project evaluation: Travel, DSA, as well as equipment and consumables etc.
Financial management, accounting, administrative follow-up Financial audit: Financial management monitoring fees in line with the requirements of the Adaptation Fund, financial reports, procurement procedures, accounting, audits, etc.															**$ 200 000**	Consultancies, management fees, External audit fees, Administrative staff salaries or part of it
GRANT AMOUNT															**$14 000 000**	

H. Disbursement schedule with time-bound milestones

Table 41: RICOWAS Detailed disbursement scheduled

Components/Outcomes/Outputs/Activities	Total Budget	Year 1	Year 2	Year 3	Year 4
Component 1: Strengthen human and institutional capacity in climate-resilient rice production (CRRP)	**$ 1 648 500,00**	**$ 469 000,00**	**$ 587 500,00**	**$ 417 000,00**	**$ 175 000,00**
Outcome 1.1. Climate change dimension in the regional Rice Offensive Strategy and the National Rice Development Strategies integrated	**$ 300 000,00**	**$ 82 500,00**	**$ 127 500,00**	**$ 70 000,00**	**$ 20 000,00**
Output 1.1.1. Climate change dimension and proposed actions integrated into the regional and national rice strategy documents	**$ 300 000,00**	**$ 82 500,00**	**$ 127 500,00**	**$ 70 000,00**	**$20 000,00**
Activity 1.1.1.1. Analysis of the impacts of climate change on rice production in West Africa	**$ 30 000,00**	**$ 30 000,00**			
Activity 1.1.1.2. Regional validation workshop and dissemination of the regional study	**$ 52 500,00**	**$ 52 500,00**			
Activity 1.1.1.3. Development of rice sector adaptation action plans for climate change to be integrated to the Rice Offensive Strategy (ROS)	**$ 35 000,00**		**$ 35 000,00**		
Activity 1.1.1.4. Regional validation workshops and dissemination of the rice sector adaptation plan	**$ 52 500,00**		**$ 52 500,00**		
Activity 1.1.1.5. Development and dissemination of rice sector briefs and methodologies to integrate climate change adaptation to rice value chain	**$ 130 000,00**		**$ 40 000,00**	**$ 70 000,00**	**$ 20 000,00**
Outcome 1.2. Key stakeholders operating in different climate zones and rice systems gained tools, knowledge and skills to successfully address climate-threats and implement CRRP in a sustainable way	**$ 1 348 500,00**	**$ 386 500,00**	**$ 460 000,00**	**$ 347 000,00**	**$ 155 000,00**
Output 1.2.1. Capacity of national and regional research centers strengthened	**$ 322 000,00**	**$ 60 000,00**	**$ 166 000,00**	**$ 80 000,00**	**$ 16 000,00**
Activity 1.2.1.1. Support the development of SRI-CRRP adapted rice growing practices, equipment and tools	**$ 210 000,00**	**$ 20 000,00**	**$ 150 000,00**	**$ 40 000,00**	
Activity 1.2.1.2. Establishment of a regional technical group to review the advancement of SRI and CRRP best practices	**$ 112 000,00**	**$ 40 000,00**	**$ 16 000,00**	**$ 40 000,00**	**$ 16 000,00**
Output 1.2.2. Institutional capacity of the regional and national executing entities for project implementation strengthened	**$ 461 500,00**	**$ 166 500,00**	**$ 140 000,00**	**$ 115 000,00**	**$ 40 000,00**
Activity 1.2.2.1. Undertake capacity needs assessment	**$ 81 500,00**	**$ 81 500,00**			
Activity 1.2.2.2. Undertake demonstration field visits at national and regional level to share and exchange good practices	**$ 130 000,00**		**$ 40 000,00**	**$ 50 000,00**	**$ 40 000,00**
Activity 1.2.2.3. Acquisition of necessary logistics material to support field implementation	**$ 195 000,00**	**$ 65 000,00**	**$ 65 000,00**	**$ 65 000,00**	
Activity 1.2.2.4. Support the process of upscaling the REE and strengthening its capacities to promote CRRP-SRI in the region	**$ 55 000,00**	**$ 20 000,00**	**$ 35 000,00**		
Output 1.2.3. Extension institutions involved in the development and dissemination of SRI and CRRP strengthened	**$ 565 000,00**	**$ 160 000,00**	**$ 154 000,00**	**$ 152 000,00**	**$ 99 000,00**
Activity 1.2.3.1. Undertake Training-of-Trainer's (ToT) on SRI, CRRP	**$ 347 000,00**	**$ 100 000,00**	**$ 100 000,00**	**$ 100 000,00**	**$ 47 000,00**
Activity 1.2.3.2. Develop, revise and produce training materials and modules for SRI, SLM and other relevant technical topics	**$ 62 000,00**	**$ 21 000,00**	**$ 15 000,00**	**$ 13 000,00**	**$ 13 000,00**
Activity 1.2.3.3. Support farmer field implementation of CRRP by extension institutions with adequate materials and resources	**$ 156 000,00**	**$ 39 000,00**	**$ 39 000,00**	**$ 39 000,00**	**$ 39 000,00**
COMPONENT 2. Assist farmers to scale-up CRRP	**$ 9 120 500,00**	**$ 2 180 750,00**	**$2 348 250,00**	**$2 504 750,00**	**$2 086 750,00**
Outcome 2.1. Smallholder rice farmers in the project zones successfully adopted SRI and CRRP practices, achieved higher rice productivity, and improved their incomes and livelihoods.	**$ 7 198 000,00**	**$ 1 972 750,00**	**$1 778 750,00**	**$1 748 750,00**	**$1 697 750,00**

Output 2.1.1. Smallholder rice farmers in the project zones strengthened their livelihoods by reducing production costs and improving rice yields through the adoption of SRI and CRRP	**$ 6 383 000,00**	**$ 1 598 750,00**	**$1 592 750,00**	**$1 598 750,00**	**$1 592 750,00**
Activity 2.1.1.1. Support the adoption and scaling-up of best practices of SRI in farmers' fields	**$ 1 300 000,00**	**$ 325 000,00**	**$ 325 000,00**	**$ 325 000,00**	**$ 325 000,00**
Activity 2.1.1.2. Promote and assist farmers in executing SLWM practices in association with their SRI fields	**$ 1 040 000,00**	**$ 260 000,00**	**$ 260 000,00**	**$ 260 000,00**	**$ 260 000,00**
Activity 2.1.1.3. Promote and assist farmers in rice seed, rice seedling and organic fertilizer production	**$ 1 755 000,00**	**$ 438 750,00**	**$ 438 750,00**	**$ 438 750,00**	**$ 438 750,00**
Activity 2.1.1.4. Provide farmers with technical expertise to implement best practices for CRRP	**$ 468 000,00**	**$ 120 000,00**	**$ 114 000,00**	**$ 120 000,00**	**$ 114 000,00**
Activity 2.1.1.5. Provide farmers access to equipment and tools to implement SRI-CRRP	**$ 1 820 000,00**	**$ 455 000,00**	**$ 455 000,00**	**$ 455 000,00**	**$ 455 000,00**
Output 2.1.2. SRI and CRRP practices - adopted by smallholders in the project zones - monitored, analyzed and the results widely shared	**$ 815 000,00**	**$ 374 000,00**	**$ 186 000,00**	**$ 150 000,00**	**$ 105 000,00**
Activity 2.1.2.1. Develop and test data tracking methodology and mechanism on the implementation of SRI and CRRP	**$ 90 000,00**	**$ 60 000,00**	**$ 30 000,00**		
Activity 2.1.2.2. Implement the baseline study on rice production and value-chain characteristics	**$ 144 000,00**	**$ 144 000,00**			
Activity 2.1.2.3. Provide agents of national institutions and extension services, researchers and smallholder rice farmers with the expertise to use the data tracking methodology	**$ 336 000,00**	**$ 80 000,00**	**$ 106 000,00**	**$ 100 000,00**	**$ 50 000,00**
Activity 2.1.2.4. Update the data analysis and CRRP tracking database annually and publish its key performance indicators and results on the project website	**$ 245 000,00**	**$ 90 000,00**	**$ 50 000,00**	**$ 50 000,00**	**$ 55 000,00**
Outcome 2.2. Rice value chain strengthened through public-private partnerships (PPP) and agricultural associations and cooperatives, and thus improved the resilience of smallholder rice farmers to the harmful effects of climate change	**$ 1 922 500,00**	**$ 208 000,00**	**$ 569 500,00**	**$ 756 000,00**	**$ 389 000,00**
Output 2.2.1. Rice production and post-harvest components in the rice value-chain strengthened	**$ 1 035 000,00**	**$ 158 000,00**	**$ 294 000,00**	**$ 470 000,00**	**$ 113 000,00**
Activity 2.2.1.1. Establish networks and create partnerships between private companies and producer cooperatives	**$ 138 000,00**	**$ 80 000,00**	**$ 58 000,00**		
Activity 2.2.1.2. Generate PPP for the development and supply of innovative agricultural equipment and their provision to farmers	**$ 338 000,00**	**$ 78 000,00**	**$ 130 000,00**	**$ 130 000,00**	
Activity 2.2.1.3. Generate PPP for threshing, processing, packaging and marketing of climate-resilient rice for vulnerable groups	**$ 286 000,00**		**$ 56 000,00**	**$ 180 000,00**	**$ 50 000,00**
Activity 2.2.1.4. Generate PPPs for the supply of organic fertilizers and rice seeds produced by smallholder farmers	**$ 273 000,00**		**$ 50 000,00**	**$ 160 000,00**	**$ 63 000,00**
Output 2.2.2. Agricultural associations and cooperatives in the rice value chain strengthened in their operations	**$ 887 500,00**	**$ 50 000,00**	**$ 275 500,00**	**$ 286 000,00**	**$ 276 000,00**
Activity 2.2.2.1. Reinforce and assist in the establishment of agricultural associations and cooperatives	**$ 237 500,00**	**$ 50 000,00**	**$ 127 500,00**	**$ 60 000,00**	
Activity 2.2.2.2. Provide and reinforce advisory services to agricultural associations and cooperatives	**$ 390 000,00**		**$ 78 000,00**	**$ 156 000,00**	**$ 156 000,00**
Activity 2.2.2.3. Provide assistance to agricultural associations and cooperative in accessing and managing agricultural credits and subsidies	**$ 260 000,00**		**$ 70 000,00**	**$ 70 000,00**	**$ 120 000,00**
COMPONENT 3. Strengthen communication, advocacy and partnerships to scale-up CRRP	**$ 1 030 000,00**	**$ 297 000,00**	**$ 285 000,00**	**$ 224 000,00**	**$ 224 000,00**
Outcome 3.1. Awareness and knowledge of CRRP in West Africa greatly increased	**$ 515 000,00**	**$ 122 500,00**	**$ 171 500,00**	**$ 110 500,00**	**$ 110 500,00**

Output 3.1.1. Knowledge and awareness materials developed and widely disseminated	$ 515 000,00	$ 122 500,00	$ 171 500,00	$ 110 500,00	$ 110 500,00
Activity 3.1.1.1. Development of a communication strategy and plan	$ 86 000,00	$ 50 000,00	$ 36 000,00		
Activity 3.1.1.2. Development of a user-friendly web-based platform for SRI and CRRP methods	$ 30 000,00		$ 30 000,00		
Activity 3.1.1.3. Production of documents, videos, radio shows, maps.	$ 70 000,00		$ 20 000,00	$ 25 000,00	$ 25 000,00
Activity 3.1.1.4. Organization of knowledge-sharing events and exchange visits at local, national, regional and global level including Asia, Latin America and other parts of Africa.	$ 290 000,00	$ 72 500,00	$ 72 500,00	$ 72 500,00	$ 72 500,00
Activity 3.1.1.5. Writing, dissemination and presentation of policy and advocacy briefs on climate adaptation strategies and project impact for rice production and its role in adapting to climate change.	$ 39 000,00		$ 13 000,00	$ 13 000,00	$ 13 000,00
Outcome 3.2. Partnerships and coordination strengthened to enable the mainstreaming of CRRP in West Africa.	$ 515 000,00	$ 174 500,00	$ 113 500,00	$ 113 500,00	$ 113 500,00
Output 3.2.1. Synergies among partners established to mainstream CRRP in West Africa	$ 515 000,00	$ 174 500,00	$ 113 500,00	$ 113 500,00	$ 113 500,00
Activity 3.2.1.1. Setting up of operational mechanisms for information-sharing, networking, and coalition-building for the scaling-up of CRRP	$ 125 000,00	$ 50 000,00	$ 25 000,00	$ 25 000,00	$ 25 000,00
Activity 3.2.1.2. Development of national networks that integrate all SRI and CRRP activities.	$ 156 000,00	$ 66 000,00	$ 30 000,00	$ 30 000,00	$ 30 000,00
Activity 3.2.1.3. Organization of annual national events on rice and its linkage with climate change in West Africa	$ 234 000,00	$ 58 500,00	$ 58 500,00	$ 58 500,00	$ 58 500,00
Subtotal All Components	$ 11 799 000,00	$ 2 946 750,00	$3 220 750,00	$3 145 750,00	$2 485 750,00
Project Execution Costs 9,5%	$ 1 120 905,00	$ 280 226,25	$ 280 226,25	$ 280 226,25	$ 280 226,25
Project inception launch activities	$ 59 000,00	$ 59 000,00			
Project coordination and management fees	$ 448 000,00	$ 112 000,00	$ 112 000,00	$ 112 000,00	$ 112 000,00
Operating costs	$ 280 000,00	$ 70 000,00	$ 70 000,00	$ 70 000,00	$ 70 000,00
Equipment	$ 112 000,00	$ 56 000,00		$ 56 000,00	
Monitoring & Evaluation	$ 221 905,00	$ 55 476,25	$ 55 476,25	$ 55 476,25	$ 55 476,25
Subtotal	$ 1 120 905,00	$ 280 226,25	$ 280 226,25	$ 280 226,25	$ 280 226,25
Total Project Costs	$ 12 919 905,00	$ 3 226 976,25	$3 500 976,25	$3 425 976,25	$2 765 976,25
Project Implementation Costs 8,34%	$ 1 080 095,00	$ 270 023,75	$ 270 023,75	$ 270 023,75	$ 270 023,75
GRANT AMOUNT	$ 14 000 000,00	$ 3 497 000,00	$3 771 000,00	$3 696 000,00	$3 036 000,00

Table 42: Disbursement summary tab according to AF template

	Upon Agreement signature	One year after Project Start	Two years after Project Start	Three years after Project Start	Total
Schedule date	**December 2021**	**June 2023**	**June 2024**	**June 2025**	
Project Funds	$ 3 226 976,25	$ 3 500 976,25	$ 3 425 976,25	$ 2 765 976,25	**$ 12 919 905,00**
Implementing Entity Fees	$ 270 023,75	$ 270 023,75	$ 270 023,75	$ 270 023,75	**$ 1 080 095,00**
Total	**$ 3 497 000,00**	**$ 3 771 000,00**	**$ 3 696 000,00**	**$ 3 036 000,00**	**$ 14 000 000,00**

Table 43: RICOWAS activities' timeline

Components	Outcomes	Outputs	Activities	Year 1				Year 2				Year 3				Year 4			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Component 1 Strengthen human and institutional capacity in climate-resilient rice production (CRRP)	Outcome 1.1. Climate change dimension in the regional Rice Offensive Strategy and the National Rice Development Strategies integrated	Output 1.1.1. Climate change dimension and proposed actions integrated into the regional and national rice strategy documents	Activity 1.1.1.1. Analysis of the impacts of climate change on rice production in West Africa																
			Activity 1.1.1.2. Regional validation workshop and dissemination of the regional study																
			Activity 1.1.1.3. Development of rice sector adaptation action plans for climate change to be integrated to the Rice Offensive Strategy (ROS)																
			Activity 1.1.1.4. Regional validation workshops and dissemination of the rice sector adaptation plan																
			Activity 1.1.1.5. Development and dissemination of rice sector briefs and methodologies to integrate climate change adaptation to rice value chain																
			Activity 1.2.1.1. Support the development of SRI-CRRP adapted rice growing practices, equipment and tools																
			Activity 1.2.1.2. Establishment of a regional technical group to review the advancement of SRI and CRRP best practices																
		Output 1.2.2. Institutional capacity of the regional and national executing entities for project implementation strengthened	Activity 1.2.2.1. Undertake capacity needs assessment																
			Activity 1.2.2.2. Undertake demonstration field visits at national and regional level to share and exchange good practices																
			Activity 1.2.2.3. Acquisition of necessary logistics material to support field implementation																
			Activity 1.2.2.4. Support the process of upscaling the REE and strengthening its capacities to promote CRRP-SRI in the region																
		Output 1.2.3. Extension institutions involved in the development and dissemination of SRI and CRRP strengthened	Activity 1.2.3.1. Undertake Training-of-Trainer (ToT) workshops on SRI-CRRP																
			Activity 1.2.3.2. Develop, revise and produce training materials and modules for SRI, SLM and other relevant CRRP technical topics																
			Activity 1.2.3.3. Support farmer field implementation of CRRP by extension institutions with adequate materials and resources																
COMPONENT 2 Assist farmers to scale-up CRRP	Outcome 2.1. Smallholder rice farmers in the project zones successfully adopted SRI and CRRP practices, achieved higher rice productivity, and improved their incomes and livelihoods.	Output 2.1.1. Smallholder rice farmers in the project zones strengthened their livelihoods by reducing production costs and improving rice yields through the adoption of SRI and CRRP	Activity 2.1.1.1. Support the adoption and scaling-up of best practices of SRI in farmers' fields																
			Activity 2.1.1.2. Promote and assist farmers in executing SLWM practices in association with their SRI fields																
			Activity 2.1.1.3. Promote and assist farmers in rice seed, rice seedling and organic fertilizer production																
			Activity 2.1.1.4. Provide farmers with technical expertise to implement best practices for CRRP																
			Activity 2.1.1.5. Provide farmers access to equipment and tools to implement SRI-CRRP																
		Output 2.1.2. SRI and CRRP practices - adopted by smallholders in the project zones - monitored, analyzed and the results widely shared	Activity 2.1.2.1. Develop and test data tracking methodology and mechanism on the implementation of SRI and CRRP																
			Activity 2.1.2.2. Implement the baseline study on rice production and value-chain characteristics																
			Activity 2.1.2.3. Provide agents of national institutions and extension services, researchers and smallholder rice farmers with the expertise to use the data tracking methodology																
			Activity 2.1.2.4. Update the data analysis and CRRP tracking database annually and publish its key performance indicators and results on the project website																
	Outcome 2.2. Rice value chain strengthened through public-private partnerships (PPP) and agricultural associations and cooperatives, and thus improved the resilience of smallholder rice farmers to the harmful effects of climate change	Output 2.2.1. Rice production and post-harvest components in the rice value-chain strengthened	Activity 2.2.1.1. Establish networks and create partnerships between private companies and producer cooperatives																
			Activity 2.2.1.2. Generate PPP for the development and supply of innovative agricultural equipment and their provision to farmers																
			Activity 2.2.1.3. Generate PPP for threshing, processing, packaging and marketing of climate-resilient rice for vulnerable groups .																
			Activity 2.2.1.4. Generate PPPs for the supply of organic fertilizers and rice seeds produced by smallholder farmers																
		Output 2.2.2. Agricultural associations and cooperatives in the rice value chain strengthened in their operations	Activity 2.2.2.1. Reinforce and assist in the establishment of agricultural associations and cooperatives																
			Activity 2.2.2.2. Provide and reinforce advisory services to agricultural associations and cooperatives																
			Activity 2.2.2.3. Provide assistance to agricultural associations and cooperative in accessing and managing agricultural credits and subsidies																
COMPONENT 3 Strengthen communication, advocacy and partnerships to scale-up CRRP	Outcome 3.1. Awareness and knowledge of CRRP in West Africa greatly increased	Output 3.1.1. Knowledge and awareness materials developed and widely disseminated	Activity 3.1.1.1. Development of a communication strategy and plan																
			Activity 3.1.1.2. Development of a user-friendly web-based platform for SRI and CRRP methods																
			Activity 3.1.1.3. Production of documents, videos, radio shows, maps.																
			Activity 3.1.1.4. Organization of knowledge-sharing events and exchange visits at local, national, regional and global level including Asia, Latin America and other parts of Africa.																
			Activity 3.1.1.5. Writing, dissemination and presentation of policy and advocacy briefs on climate adaptation strategies and project impact for rice production and its role in adapting to climate change.																
	Outcome 3.2. Partnerships and coordination strengthened to enable the mainstreaming of CRRP in West Africa.	Output 3.2.1. Synergies among partners established to mainstream CRRP in West Africa	Activity 3.2.1.1. Setting up of operational mechanisms for information-sharing, networking, and coalition-building for the scaling-up of CRRP																
			Activity 3.2.1.2. Development of national networks that integrate all SRI and CRRP activities.																
			Activity 3.2.1.3. Organization of annual national events on rice and its linkage with climate change in West Africa																

Endorsement by governments and certification by the IE

A. Record of endorsement on behalf of the government

Benin	Prof. Martin Pépin AINA, Adaptation Fund National Designated Authority, Directeur Général de l'Environnement et du Climat, Ministère du Cadre de Vie et du Développement Durable	Date: April 13, 2021
Burkina Faso	Mr. Inoussa OUIMINGA, Adaptation Fund National Designated Authority, Ministère de l'Economie, des Finances et du Développement	Date: April 15, 2021
Côte d'Ivoire	Mr. Oreste Santoni Akossi, Adaptation Fund National Designated Authority, Deputy Director, Climate Change Departement, Ministry of Environment and Sustainable Development	Date: April 28, 2021
The Gambia	Mr. Bubacar ZAIDI JALLOW, Adaptation Fund National Designated Authority, Ministry of Environment, Climate Change and Natural Resources	Date: April 29, 2021
Ghana	Mr. Peter Justice DERY, Adaptation Fund Designated Authority Ghana, Director for Environment, Ministry of Environment, Science, Technology and Innovation	Date: April 19, 2021
Guinea	Mrs. Oumou DOUMBOUYA, Adaptation Fund National Designated Authority, Ministère de l'Environnement, des Eaux et Forêts	Date: April 22, 2021
Liberia	Mr. Jeremiah Garwo Sokan Sr, National Coordinator/National Climate Change Secretariat, Designated Authority of Liberia, Environmental Protection Agency, National Climate Change Secretariat	Date: April 29, 2021
Mali	Mrs. NIAMBELE AMINIATA DIARRA, Adaptation Fund National Designated Authority, Ministère de l'Environnement, de l'Assainissement et du Développement Durable	Date: April 29, 2021
Niger	Dr. Kamaye Maazou, Secrétaire Exécutif du CNEDD, Point Focal National du FA, Cabinet du Premier Ministre, Conseil National de l'Environnement pour un Développement Durable, Sécretariat Exécutif	Date: May 04; 2021
Nigeria	Mrs. Halima Bawa-Bwari, Adaptation Fund National Designated Authority, UNFCCC Focal Point/Director, Director, Department of Climate Change, Federal Ministry of Environment	Date: April 20, 2021
Senegal	Madame Dior Alioune Sidibe, Chef de la Division Gestion du Littoral, Autorité Nationale Désignée pour le Fonds d'Adaptation, Ministère de l'Environnement et du Développement Durable	Date: April 30, 2021
Sierra Leone	Dr. Bondi Gevao, Executive Chairman, EPA Sierra Leone, Adaptation Fund National Designated Authority, Environment Protection Agency	Date: April 20, 2021
Togo	Mr. Thiyu Kohoga Essobiyou, Director of Environment, AF Focal Point, Ministère de l'Environnement du Développement Durable	Date: May 04, 2021

B. Implementing Entity certification

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (ECOWAS, CAADP, NAP, NAPA, NDC,..) and subject to the approval by the Adaptation Fund Board, commit to implementing the project in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this regional project.

Mr. Nabil BEN KHATRA – *Executive Secretary of the Sahara and Sahel Observatory (OSS) as the Implementing Entity Coordinator*

Name & Signature

Date: **August 09, 2021**	Tel.: **(+216) 71 206 633** Email: nabil.benkhatra@oss.org.tn; boc@oss.org.tn
Project Contact Person: **Mrs. Khaoula JAOUI**	
Tel. and Email: **(+216) 71 206 633 –** khaoula.jaoui@oss.org.tn	

Annexes

Annex 1 Endorsement Letters

ADAPTATION FUND

N° 456 /DGEC/MCVDD/SD

Republic of Benin, Cotonou, april 13, 2021

To: **The Adaptation Fund Board**
c/o Adaptation Fund Board Secretariat
Email: afbsec@adaptation-fund.org
Fax: 202 522 3240/5

Subject: Endorsement for Project Scaling-up Climate Rice Production in West Africa

In my capacity, as designated authority for the Adaptation Fund in Republic of Benin, I confirm that the above regional project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Benin.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the Sahara and Sahel Observatory (OSS) and executed by Regional Center for Specialization in Rice of ECOWAS (CRS-RIZ/IER) based in Mali, in partnership with Climate-Resilient Farming Systems Program at Cornell University, USA in collaboration with the Ministry of Agriculture, Livestock and Fishing of Benin at national level.

Sincerely,

Le Directeur Général

Name: Professor Martin Pépin AINA
Title: General Director of Environment and Climate
National Designated Authority for the Adaptation / Adaptation Fund

BURKINA FASO

Unité – Progrès - Justice

Ministère de l'Economie, des Finances et du Développement

Direction Générale de la Coopération

ADAPTATION FUND

Letter of Endorsement by Government

Ouagadougou, 15th April, 2021

To : The Adaptation Fund Board
C/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for Project « Scaling-up Climate-Resilient Rice Production in West Africa ".

In my capacity as Designated Authority for the Adaptation Fund in Burkina Faso, I confirm that the above regional project proposal is in accordance with the Government's national priorities in implementing adaptation activities to reduce adverse impacts, and risks, posed by climate change in Burkina Faso.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by Sahara and Sahel Observatory (OSS) and executed by Centre for Specialization in Rice of ECOWAS (CRS-RIZ/IER) in partnership with Climate-Resilient Farming Systems Program at Cornell University.

Sincerely.

Inoussa OUIMINGA
Adaptation Fund National Designated Authority
03 BP 7067 Ouagadougou 03
Tel: +226 25 31 25 50/+226 70 24 83 25
Email: jouiminga@yahoo.fr

MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

GENERAL DIRECTION OF ENVIRONMENT

CLIMATE CHANGE DEPARTMENT

REPUBLIC OF CÔTE D'IVOIRE
Union - Discipline - Work

ADAPTATION FUND

N°0061 ✓ /MINEDD/DGE/DLCC/FA/aos

Abidjan, le 28 AVR 2021

Letter of Endorsement by Government of Côte d'Ivoire

To: **The Adaptation Fund Board**
c/o Adaptation Fund Board Secretariat
Email: afbsec@adaptation-fund.org
Fax: 202 522 3240/5

Subject: Endorsement for Project "***Scaling-up Climate Rice Production in West Africa***"

In my capacity as designated authority for the Adaptation Fund in Republic of Côte d'Ivoire, I confirm that the above regional project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Côte d'Ivoire.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by Sahara and Sahel Observatory (OSS) and executed by Regional Centre for Specialization in Rice of ECOWAS (CRS-RIZ/IER) based in Mali, in partnership with Climate-Resilient Farming Systems Program at Cornell University, USA and in collaboration with the Ministry of Environment and Sustainable Development, and the Ministry of Agriculture and Rural Development of Côte d'Ivoire at national level.

Sincerely,

Ministère de l'Environnement et du Développement Durable – Autorité Nationale Désignée du Fonds d'Adaptation (FA) – Le Point Focal

AKOSSI Oreste Santoni
Adaptation Fund National Designated Authority, Côte d'Ivoire
Deputy Director, Climate Change Department
Téléphone : +225 07 08 45 43 03
Email : o.akossi@environnement.gouv.ci
akossisantoni@gmail.com

ADAPTATION FUND

Letter of Endorsement by Government of The Gambia

29th April 2021

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: afbsec@adaptation-fund.org
Fax: 202 522 3240/5

Subject: Endorsement for Project Scaling-up Climate Rice Production in West Africa

In my capacity as Designated Authority for the Adaptation Fund in Gambia, I confirm that the above regional project proposal is in accordance with the Government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Gambia.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the Sahara and Sahel Observatory (OSS) and executed by Regional Center for Specialization in Rice of ECOWAS (CRS-RIZ/IER) based in Mali, in partnership with Climate-Resilient Farming Systems Program at Cornell University, USA.

Sincerely,

Bubacar Zaidi Jallow
Director, Central Project Coordination Unit,
Ministry of Environment, Climate change & Natural Resources

MINISTRY OF ENVIRONMENT, SCIENCE, TECHNOLOGY & INNOVATION

Our Ref: IA/006/02/v.2

Tel: 0302 - 666 049
Fax: 0302 – 688 913/ 688 663
E-mail: info@mesti.gov.gh
Website: www.mesti.gov.gh

Republic of Ghana

Post Office Box M232
Ministries, Accra
Ghana

April 19, 2021

THE ADAPTATION FUND BOARD

% ADAPTATION FUND BOARD SECRETARIAT

EMAIL: afbsec@adaptation-fund.org

FAX: 202 522 3240/5

ENDORSEMENT FOR PROJECT SCALING-UP CLIMATE RICE PRODUCTION IN WEST AFRICA

In my capacity as designated authority for the Adaptation Fund in the Republic of Ghana, I confirm that the above regional project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Ghana.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the Sahara and Sahel Observatory (OSS) and executed by Regional Centre for Specialisation in Rice of ECOWAS (CRS-RIZ/IER) based in Mali, in partnership with Climate-Resilient Farming Systems Programme at Cornell University, USA and in collaboration with Savanna Agricultural Research Institute (SARI) of Ghana at the national level.

PETER DERY

DIRECTOR, ENVIRONMENT

REPUBLIQUE DE GUINEE
Travail–Justice- Solidarité

MINISTERE DE L'ENVIRONNEMENT
DES EAUX ET FORETS

ADAPTATION FUND

DIRECTION NATIONALE
DES POLLUTIONS NUISANCES ET
CHANGEMENTS CLIMATIQUES

Conakry, le 22.04/2021

CONVENTION-CADRE DES NATIONS UNIES SUR LES CHANGEMENTS CLIMATIQUES

N°.02/MEEF/DNPNCC/CCNUCC/FA/20

Le Point Focal National

Letter of Endorsement by Government

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: afbsec@adaptation-fund.org
Fax: 202 522 3240/5

Subject: Endorsement for the Project Scaling-up Climate Rice Production in West Africa

In my capacity as designated authority for the Adaptation Fund in the Republic of Guinea, I confirm that the above regional project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the Republic of Guinea.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the Sahara and Sahel Observatory (OSS) and executed by Regional Center for Specialization in Rice of ECOWAS (CRS-RIZ/IER) based in Mali, in partnership with Climate-Resilient Farming Systems Program at Cornell University, USA and in collaboration with the Agricultural Research Institute of Guinea (IRAG) and with the Climate Program of the Ministry of Environment, Water and Forests.

Sincerely,

MEEF/DNPNCC/Guinée
Point Focal National
CCNUCC/UNFCCC

Mrs Oumou DOUMBOUYA
Focal Point Adaption Fund

Ministère de l'Environnement, des Eaux et Forêts, Direction Nationale des Pollutions, Nuisances et Changements Climatiques, Quartier Almamya
Immeuble CNLS, Tél : (+224) 622 49 82 03/652 63 64 63, BP : 3118-Conakry, République de Guinée

Office of the National Coordinator

REPUBLIC OF LIBERIA
ENVIRONMENTAL PROTECTION AGENCY
NATIONAL CLIMATE CHANGE SECRETARIAT
4th Street, Tubman Boulevard
1000 Monrovia, 10 Liberia
P.O. Box 4024

ADAPTATION FUND

April 29, 2021

Letter of Endorsement by Government

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: afbsec@adaptation-fund.org
Fax: 202 522 3240/5

Subject: Endorsement for Project Scaling-up Climate Rice Production in West Africa

In my capacity as designated authority for the Adaptation Fund in Liberia, I confirm that the above regional project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Liberia.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the Sahara and Sahel Observatory (OSS) and executed by Regional Center for Specialization in Rice of ECOWAS (CRS-RIZ/IER) based in Mali, in partnership with CHAP International - Liberia.

Sincerely,

ENVIRONMENTAL PROTECTION AGENCY MONROVIA, LIBERIA

Jeremiah Garwo Sokan, Sr.
National Coordinator/National Climate Change Secretariat
Designated Authority of Liberia

jsokansr7@yahoo.com / jsokan@epa.gov.lr +231770775174 / 886788594

ADAPTATION FUND

MINISTERE DE L'ENVIRONNEMENT, DE L'ASSAINISSEMENT ET DU DEVELOPPEMENT DURABLE

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REPUBLIQUE DU MALI
Un Peuple — Un But— Une Foi

--*-*-*-*-*-*

Bamako, 29 Avril 2021

Letter of Endorsement by Government

To: The Adaptation Fund Board clo Adaptation Fund Board Secretariat Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for "Scaling Project Climate Resilient Rice Production in West Africa"

In my capacity as Designated Authority for the Adaptation Fund in Mali, I confirm that the above regional programme proposal is in accordance with the government's regional priorities in implementing adaptation activities to reduce adverse impacts and risks, posed by climate change in the ECOWAS countries (Benin, Burkina Faso, Côte d'Ivoire, the Gambia, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo).

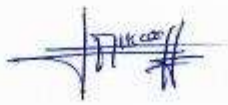
Accordingly, I am pleased to endorse the above programme proposal with support from the Adaptation Fund. If approved, the programme will be implemented by the Sahara and Sahel Observatory (OSS) and executed by Regional Center for Specializationin Rice of ECOWAS (CRS-RIZ/IER) based in Mali.

Sincerely,

Madame NIAMBELE AMINATA DIARRA,
Adaptation Fund National Designated Authority, Mali

Tel: + (223)76076611 Bamako/Mali

Email: mineyitou@yahoo.fr



ADAPTATION FUND

Letter of Endorsement by Government

REPUBLIQUE DU NIGER

Fraternité – Travail – Progrès

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CABINET DU PREMIER MINISTRE

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CONSEIL NATIONAL DE L'ENVIRONNEMENT POUR UN DEVELOPPEMENT DURABLE

SECRETARIAT EXECUTIF

==========

04/05/2021

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: afbsec@adaptation-fund.org
Fax: 202 522 3240/5

Objet : Approbation pour le Projet: Mise à l'échelle d'une riziculture résiliente au climat en Afrique de l'Ouest

En ma qualité d'Autorité désignée du Fonds d'Adaptation au Niger, je confirme que la proposition de projet/programme ci-dessus au niveau régional est conforme aux priorités nationales du gouvernement dans la mise en œuvre d'activités d'adaptation visant à réduire les effets néfastes impacts et risques du changement climatique au Niger.

En conséquence, je suis heureux d'approuver la proposition de projet / programme susmentionnée. S'il est approuvé, le projet / programme sera mis en œuvre par l'observatoire du Sahara et du Sahel (OSS) et exécuté par le Centre Régional de Spécification en Riz de la CEDEAO basé au Mali en collaboration avec le Ministère de l'Agriculture du Niger, l'Institut National de la Recherche Agronomique du Niger (INRAN) ainsi que d'autres structures nationales clés.

Cordialement.

Dr KAMAYE MAAZOU

SECRETAIRE EXECUTIF DU CNEDD

FEDERAL MINISTRY OF ENVIRONMENT

HEADQUARTERS, MABUSHI, ABUJA.

Ref. No FMENV/DCC/AF/15/V.1 Date 20th April, 2021

To: The Adaptation Fund Board
c/o Adaptation Fund Board secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 2025223240/5

Subject: Endorsement for Project "Scaling-up Climate-Resilient Rice Production in West Africa"

In my capacity, as National Designated Authority for the Adaptation Fund in Nigeria, I confirm that the above regional project proposal is in accordance with the Nigeria government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks posed by climate change in Nigeria.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund, if approved, the project will be implemented by Sahara and Sahel Observatory (OSS) and executed by Regional Centre for Specialization in Rice of ECOWAS (CRS-RIZ/IER) in partnership with Climate-Resilient Farming Systems Program at Cornell University, USA in collaboration with the Agricultural Research Council of Nigeria (ARCN) of the Federal Ministry of Agriculture and Rural Development.

Sincerely

Halima Bawa-Bwari
Adaptation Fund National Designated Authority;
UNFCCC/Focal Point/Ag. Director, Department of Climate Change

www.environmental.gov.ng info@environment.gov.ng

N° 050 MEDD/DEEC/DGL/CTdas

République du Sénégal
Un Peuple - Un But - Une Foi

MINISTERE DE L'ENVIRONNEMENT ET DU DEVELOPPEMENT DURABLE

DIRECTION DE L'ENVIRONNEMENT ET DES ETABLISSEMENTS CLASSES

DEEC

Dakar, le 30 AVR. 2021

ADAPTATION FUI

Autorité Nationale Désignée
pour le Fonds d'Adaptation

A

Le conseil d'administration du Fonds d'Adaptation
c/o Secrétariat du Conseil du Fonds d'Adaptation
Email: secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Objet: Approbation du Projet "Mise à l'échelle d'une riziculture résiliente au climate en Afrique de l'Ouest".

En ma qualité d'autorité nationale designée du Fonds d'Adaptation du Sénégal, je confirme que la proposition de projet est conforme aux priorités nationales du Sénégal dans la mise en œuvre d'activités d'adaptation visant à réduire les effets néfastes (impacts et risques) du changement climatique au Sénégal.

En conséquence, j'approuve la proposition du projet "Mise à l'échelle d'une riziculture résiliente au climate en Afrique de l'Ouest".Il sera mis en œuvre par l'Observatoire du Sahara et du Sahel (OSS) et exécuté par le Centre Régional de Spécification en Riz de la CEDEAO basé au Mali en collaboration avec le programme Climate-Resilient Faring Systems de l'Université de Cornell, Etats Unis. L'Agence Natioanle de Conseil Agricole et Rural (ANCAR) du Ministère de l'Agriculture et de l'Equipement Rural exécutera au niveau national les activités du projet.

Je vous prie d'agréer, **Monsieur le Président**, l'expression de ma consideration distinguée.

Cordialement.

Dior Alioune SIDIBE

D.E.E.C

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GOVERNMENT OF SIERRA LEONE
Environment Protection Agency
Ministry of the Environment
92, Dundas Street, Freetown

20th April 2021

To the Adaptation Fund Board
C/o Adaptation Fund Board Secretariat
Email: secretariat@adaptation_fund.org
Fax: 2025223240/5

Subject: Endorsement for project "Scaling up Climate- Resilient Rice Production in West Africa"

In my capacity as the National Designated Authority for the adaptation fund in Sierra Leone, I confirm that the above west Africa regional project proposal is in accordance with the sierra Leone Government's priorities in implementing adaptation activities to reduce adverse impact of, and risks, posed by climate change in Sierra Leone.

Accordingly, I am pleased to endorse the said project proposal to be submitted to adaptation fund. If approved, the project will be implemented by the Sahara and Sahel observatory, and executed by the Regional Centre for Specialization in Rice of ECOWAS, in partnership with the Sierra Leone Environment Protection Agency and the Rokupr Agricultural Research Centre.

Yours Sincerely,

Dr. Bondi Gevao
Executive chairman, EPA Sierra Leone
Telephone: +232 79 049 175
Email:gevaob@yahoo.com
Adaptation Fund National Designated Authority

ADAPTATION FUND

MINISTERE DE L'ENVIRONNEMENT
ET DES RESSOURCES FORESTIERES

SECRETARIAT GENERAL

DIRECTION DE L'ENVIRONNEMENT

Point focal du Fonds d'adaptation

REPUBLIQUE TOGOLAISE
Travail-Liberté-Patrie

N° 0269 / DE/AF

Lomé, le 04 MAI 2021

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: afbsec@adaptation-fund.org
Fax: 202 522 3240/5

Subject: Endorsement for Project Scaling-up Climate Rice Production in West Africa

In my capacity as designated authority for the Adaptation Fund in Togo, I confirm that the above regional project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Togo.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the Sahara and Sahel Observatory (OSS) and executed by Regional Center for Specialization in Rice of ECOWAS (CRS-RIZ/IER) based in Mali, in partnership with Climate-Resilient Farming Systems Program at Cornell University, USA.

Sincerely,

Thiyu Kohoga ESSOBIYOU

Director of environment

Adaptation Fund Focal point

Annex 2 Environmental and Social Impact Assessment (ESIA) and Environment and Social Management Plan (ESMP)

INTRODUCTION

Like any other Adaptation Fund financed projects, community development projects, mainly in the agricultural sector, need to comply with the Fund's Environmental and Social Policy (ESP) adopted in November 2013. This policy requires that all environmental safeguard documents shall be made available before approval. The aim of the ESP is to enhance positive social and environmental opportunities and benefits as well as ensure that adverse social and environmental risks and impacts are avoided, minimized, and mitigated.

The ESP has 15 principles to manage unnecessary risks that are put into practice during the development of projects. Among them are promoting human rights and gender equality, protecting natural habitats, preserving biodiversity, empowering vulnerable groups such as indigenous communities, and preventing pollution.

The purpose of this party is to provide a practical plan to manage the potential environmental and social unintended negative impacts associated with the project's activities, as well as to allow for meaningful and inclusive multi-stakeholder consultations and engagement throughout the lifecycle of the project.

The objectives of the identification and evaluation of socio-environmental risk are to:

- Integrate the ESP Principles in order to maximize social and environmental opportunities and benefits and strengthen social and environmental sustainability,
- Identify potential social and environmental risks and their significance; and,
- Determine the level of social and environmental assessment and management required to address potential risks and impacts.

For the RICOWAS project, the Environmental and Social Impact Assessment (ESIA) and the Environment and Social Management Plan (ESMP) were conducted with inputs from the 13 National Executing Entities and in direct collaboration with the Sahara and Sahel Observatory (OSS).

The screening found that, although the project brings significant benefits to the targeted communities and ecosystems, there are activities that could generate some minor adverse social and environmental impacts. The screening resulted in an overall social and environmental risk categorization of "Type B". The ESMP is designed to avoid potential negative impacts, and where avoidance is impossible, to mitigate and manage these limited potential impacts.

The ESIA and ESMP document is structured as follows:

(i) Overview of the project, including activities and documentation on target areas;

(ii) Risk Identification and Categorization; and

(iii) ESMP.

CONTEXT

Project background

West Africa is the rice production basket of Sub-Saharan Africa, producing over two thirds of its rice. Rice is a staple crop grown in West Africa for more than 3500 years with the domestication of African rice (*Oryza glaberrima*). Produced by low-income smallholders across the entire region, rice plays a key role in regional food security for rural and urban populations. In recent years, increasing demand stemming from population growth and steady increase in annual per capita consumption (combined at 5.93% per year from 2010-2017; with per capita consumption in 2017 as high as 164 kg in Sierra Leone and 150 kg in Guinea) has outpaced production (4.1% per year for the same time period), leading to ever-increasing rice imports from Asia, accounting for 46% in 2017[31]. This places a heavy burden on government budgets and exposes the region to the volatility of world market prices. This became apparent in 2008, when world market prices tripled in less than four months, resulting in riots (e.g. Liberia, Senegal) over a staple food that the majority of population could not afford anymore. In response, the Economic Community of West African States (ECOWAS) launched a regional Rice Offensive in 2013 with the goal to achieve rice self-sufficiency by 2025.

The untapped potential to increase rice production is very high, based on currently low yields, under-utilized land and the availability of climate-smart rice production techniques. By using the climate-resilient rice production approach, the Rice Offensive can address critical challenges simultaneously: respond to increasing rice consumption needs, strengthen livelihoods of rice farming communities, allow for diversification of crops as well as other economic activities, improve the national economic well-being, free-up hard currency – previously used for rice imports - for other national needs, and contribute to political stability. All in all, this will allow to withstand and adapt to the imminent climate change threads to this key economic sector, and free human, environmental and financial capitals to tackle other pressing adaptation priorities. In addition, it was noted that the yield of rice increased by 33.22% over the period 2007-2017 while that of corn increased by

[31] Styger E, Traoré G. 2018. 50,000 farmers in 13 countries: results from scaling-up SRI in West Africa. CORAF, Dakar, Senegal

only 5% over the same period. Other cereals such as millet and sorghum have seen their yield decline over the same period. These figures reflect the importance of rice production in the region[32].

West Africa has been identified to be particularly vulnerable to climate change due to the combination of naturally high levels of climate variability, high reliance on rainfed agriculture, and limited economic and institutional capacity to cope with climate change3.

Given this challenge, OSS in partnership with IER/CRoS-Rice is developing a regional response. The project entitled RICOWAS will be implemented in the 13 ECOWAS countries: Benin, Burkina Faso, Côte d'Ivoire, The Gambia, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo. It will build on existing human and institutional capacity, and the achievements of the regional project "Improving and Scaling up the System of Rice Intensification in West Africa" (SRI-WAAPP), which was commissioned and supervised by the West and Central African Council for Agricultural Research (CORAF/WECARD).

Project Objectives

The global objective of the project is to improve climate resilience and increase rice system productivity of smallholder rice farmers across West Africa using a climate-resilient rice production approach. More specifically the project will:

- Strengthen the resilience and capacity of smallholder rice farmers and other rice stakeholders in the region to use agro-ecological and sustainable land and water management strategies that respond to the climate change threats in their respective localities.
- Assist farmers to implement and scale-up Climate-Resilient Rice Production (CRRP), and to participate in other economic activities of the rice-value chain.
- Support a communication platform and engage in advocacy to promote efficient exchange of knowledge and expertise among diverse stakeholder groups in West Africa and beyond.
- Facilitate the establishment of a coalition of partners at national and regional levels for the scaling-up of CRRP.

The RICOWAS project zone covers 396 communes in 173 districts in 89 regions across the 13 countries. Total population in the project zone adds up to more than 35.7 million people, 7.4% of the total population of all 13 countries. The primary direct beneficiaries in the RICOWAS project zones are a projected 153,131 rice growers implementing CRRP on an estimated 71,240 ha over the course of the project, 37% of these farmers will be women.

Table 1: Project intervention areas

Country	Regions	Districts	Communes	Total population	Total Direct Beneficiaries (= Rice Producers)	Men	Women	Women	Total Rice area
	Numbers	Numbers	Numbers	Numbers	Numbers	Numbers	Numbers	%	ha
Benin	4	9	23	2,432,899	7,128	3,299	3,829	54	7,061
Burkina Faso	6	17	22	7,748,307	6,830	3,923	2,907	43	2,142
Côte d'Ivoire	25	32	32	1,050,242	3,392	2,869	523	15	3,199
The Gambia	4	6	18	252,501	8,485	1,575	6,910	81	2,122
Ghana	7	16	54	12,800,659	13,173	10,246	2,927	22	10,176
Guinea	4	6	6	540,215	5,600	4,050	1,550	28	2,200
Liberia	6	14	35	1,379,688	13,620	4,602	9,018	66	2,741
Mali	4	10	11	521,016	18,164	15,439	2,725	15	9,403
Niger	4	8	9	571,405	10,981	10,519	462	4	3,241
Nigeria	5	5	15	2,458,044	30,000	20,000	10,000	33	15,000
Senegal	11	23	102	2,073,541	14,245	6,094	8,151	57	6,213
Sierra Leone	4	10	38	1,674,078	15,000	13,585	1,415	9	3,000
Togo	5	17	31	2,234,710	6,513	3,116	3,397	52	4,742
Total	89	173	396	35,737,305	153,131	99,317	53,814	37	71,240

32 http://www.fao.org/faostat/en/#data/QC

POLICY, INSTITUTIONAL AND LEGAL FRAMEWORK

Policy and Regulatory Frameworks

Country	
Benin	• Law No. 98-030 of February 12, 1999 on the Framework Law on the Environment in the Republic of Benin • Decree No. 2001-2035 of 12 July 2001 on the organization of environmental impact assessment procedure • Law No. 2013-01 of August 14, 2013 relating to the land and state code in the Republic of Benin • Decree No. 2015-014 dated 29 January 2015 relating to the conditions and methods for the development of rural land
Burkina Faso	• Law No. 006-2013/AN on the Environment Code of Burkina Faso • Decree No. 2001-342/PRES/PM/MEE1 of 17 July 2001 on procedures of Environmental Impact Assessments and Environmental Impact Statements • Law No. 034-2012/AN on Agrarian and Land Reorganization
Côte d'Ivoire	• Framework Law No. 96-766 on the Environment Code • Decree No. 96-894 of 08 November 1996 determining the rules and procedures applicable to studies relating to the environmental impact of development projects • Decree No. 013-41 dated 30 January 2013 relating to the strategic environmental assessment of policies, plans and programs • Order No. 00972 of November 14, 2007, relating to the application of Decree No. 96-894 of November 8, 1996 determining the rules and procedures applicable to studies relating to the environmental impact of development projects
The Gambia	• Act No. 13 of 1994 on National Environment Management • Environmental Quality Standards Regulations, 1999 • Environmental Impact Assessment Regulations, 2014
Ghana	• Environmental Assessment Regulations 1999 • The Local Government Act 1993, Labor Act 2003, • Act No. 528 of 1996 on Pesticides Control and Management • Land Planning and Soil Conservation Act of 1953 with 1957 amendments
Guinea	• Order No. 045\PRG\87 on the Code for the protection and enhancement of the environment • Decree No. 199/PRG/SGG/89 codifying environmental impact studies • Order A/2013/474/MEEF/CAB/SGG of March 11, 2013, adopting the general guide for environmental assessment
Liberia	• Environment Protection and Management Law • Regulation on Environmental Impact Assessment (FDA Regulation 113-08)
Mali	• Decree No. 09-318-P-RM of June 26, 2009 amending Decree No. 08-346-P-RM of June 26, 2008 relating to the Environmental and Social Impact Study • Decree No. 2018-0992 / P-RM of December 31, 2018 setting the rules and procedures for the strategic environmental assessment • Decree No. 2018-0991/P-RM of December 31, 2018 relating to the study and the environmental and social impact statement
Niger	• Law No. 98-56 of 29 December 1998 framework law for the management of the environment • Order No. 97-01 of 10 January 1997 on the institutionalization of environmental impact studies
Nigeria	• National Environmental (Effluent Limitation) Regulations • Act No. 25 of 2007 on National Environmental Standards and Regulations Enforcement Agency (Establishment) • Environmental Impact Assessment Act 1992. • Land Use Law
Senegal	• Law No. 2001-01 on the Environment Code • Decree No. 2001-282 implementing the Environmental Code • Decree No. 2000-73 regulating the consumption of ozone-depleting substances
Sierra Leone	• Act No. 11 of 2008 on Environment Protection Agency •
Togo	• Law No. 2008-005 30 May 2008 on framework law on the environment • Decree No. 2017-040/PR laying down the procedure for environmental and social impact assessments

Institutional Framework

Country

Benin	• Benin Environmental Agency (ABE) for Benin
Burkina Faso	• National Office of Environmental Assessments (BUNEE)
Côte d'Ivoire	• National Environment Agency (ANDE)
The Gambia	• National Environmental Agency
Ghana	• Environmental Protection Agency (EPA)
Guinea	• Guinean Environmental Studies and Assessment Office (BGEEE)
Liberia	• Environmental Protection Agency (EPA)
Mali	• National Directorate of Sanitation and Control, Pollution and Nuisance (DNACPN)
Niger	• Office of Environmental Assessment and Impact Studies (BÉEÉI)
Nigeria	• Federal Ministry of Environment(FMEnv)
Senegal	• Department of the Environment and Listed Establishments (DEEC) - Environmental Impact Studies Division
Sierra Leone	• Environment Protection Agency
Togo	• National Agency for Environmental Management (ANGE)

DESCRIPTION OF THE ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS OF THE PROJECT SITES IN THE 13 COUNTRIES

Physical environment

Geographic location and target area

Benin

The project zone will include the four rice production basins of the country: i) the Alibori and Bourgou districts in the Northeast, ii) Atakora in the Northwest, iii) Collines in the Center, and iv) Oueme, Plateau, Mono, Atlantique and Kouffou in the South. Total population in the project zone is 2.4 million people (20% of Benin's population), of whom only 28,513 are rice farmers, 24% are women. The project will work directly with 7,128 (or 25%) rice farmers on 7,061 ha of land in the project zone. 54% of the farmers will be women, who have been identified being more vulnerable than the male farmers.

Burkina Faso

The project will work in 22 communes, located in six of the 13 regions where rice is grown. The population in the project zone is 7.75 million people, of whom 195,000 are rice farmers, comprising 2.5% of that population. The project will work directly with 6,830 farmers (of whom 43% will be women) on 2,142 ha. Rice in Burkina Faso is grown mainly in the rainfed lowland system and in irrigated systems. The average land area does not exceed 0.25 ha per household.

Côte d'Ivoire

The project will work in 32 communes, one in each of 32 departments, located across 25 regions. The project will work directly with 3,392 farmers on 3,199 ha of irrigated and rainfed lowland systems. Overall, the population of the project zones includes 575,000 rice farmers, who make up 54% of the total population of these areas. A range of rice production systems exists in all regions, from rainfed lowland and upland systems, to seasonally flooded rice areas without water control, to irrigated systems with water control.

The Gambia

Scaling-up will be done in four regions covering the entire eastern part of the country (Upper River Region), central part (Central River Regions North and South), and the northern part (North Bank Region), which together make up the rice food basket of the country. The dominant rice systems are rainfed lowland and irrigated systems. The project zone includes 276,000 people, about 10% of the national population. The project will work directly with 8,485 rice farmers, of whom 81% will be women, on 2,122 ha. There are a total of 47,210 rice farmers in the project zone.

Ghana

The RICOWAS project will work in seven regions: Northern, Savanna and Upper East (in the North), Volta and Oti (in the Southeast), Ashanti (in the Center) and Western north region (in the West). The Northern, Savanna and Upper East regions alone account for 77% of national rice production. The project will work with 13,173 rice farmers, of whom 22% will be women, implementing CRRP on 10,176 ha.

Guinea

The project will work in seven prefectures in the four regions of Guinea: Upper Guinea (Faranah, and Mandiana prefectures), Middle Guinea (Mamou prefecture), Maritime Guinea (Boffa and Kindia prefectures) and Forested Guinea (Kissidougou and Gueckedou prefectures). The project will work in lowland rice systems (Kindia, Mamou, Guekedou), on alluvial plains (Faranah, Kissidougou, Mandiana), and in the mangrove rice system (Boffa). The project will work in rural areas that are in proximity to towns, in order to develop marketing mechanisms to sell rice to urban populations and allow the 5,600 project beneficiaries (28% will be women) to grow climate-resilient rice on 2,220 ha and to economically benefit from different

activities along the entire rice value-chain. The project zone has a population of 540,000 people, which is 4.2% of Guinea's population.

Liberia

The project will be implemented in six regions of the western and northern part of the country: Lofa, Nimba, Bong, Bomi, Grand Gedeh, and Montserrado. The project zone has a population of over 1.37 million people, which is 27% of Liberia's population. The project will directly work with 13,620 farmers, of whom 66% will be women, growing climate-resilient rice on 2,741 ha.

Mali

Mali is one of the largest rice producers in the region, with wide variety of rice systems, including highly productive irrigation schemes. The RICOWAS project will work in the central, western and southern regions, but not in Mopti, Timbuktu and Gao, due to safety issues. The project zone covers the regions of i) Kayes (Kita and Bafoulabe districts (called circles)), ii) Sikasso (Yanfolila and Sikasso districts), iii) Koulikoro (Kati and Kangaba districts) and iv) Ségou (Niono, Sirbala, Segou and San districts), and includes irrigated systems, rainfed lowland systems, and seasonally flooded plains. The project zone has a total population of 521,000 people, which is less than 3% of the national population. The project will work with more than 18,000 rice farmers on 9,403 ha.

Niger

Project zone will include the four regions of Tillaberi, Dosso, Tahoua and Zinder, covering a total of nine communes. The project will work on irrigated and rainfed lowland system in Tillaberi and Dossa, and on rainfed lowland systems in Tahoua and Zinder. The total number of farmer beneficiaries will be 10,981, of whom 4% will be women. The low number of women reflects the fact that rice farming in Niger is almost exclusively done by men. Total population in the project zone is 571,400, 2.5 % of Niger's population.

Nigeria

The RICOWAS project will be implemented in five States: i) Jigawa (Auyo, Miga and Jahun Local Government Areas), ii) Niger (Lavun, Wushishi, Katcha Local Government Areas), iii) Nasarawa (Doma, Obi, Awe Local Government Areas), iv) Gombe (Yamaltu-Deba, Balanga and Kaltungo Local Government Areas), and v) Ebonyi (Ikwo, Afikpo-North, Ohaukwu Local Governmnet Areas). In Niger, Jigawa, Gombe and Nasarawa states, the rice systems are irrigated and rainfed lowland, while in Ebonyi State rainfed lowland dominates. There are 2.46 million people living the project zones, 1.2% of Nigeria's population.

Senegal

Four zones are targeted by the project: i) Senegal River Valley: regions of Matam and Saint-Louis, ii) Peanut basin (Center of Senegal) regions of Kaffrine, Kaolack and Fatick, iii) Upper Casamance: regions of Tambacounda and Kedougou and iv) Lower Casamance, regions of Ziguinchor, Sedhiou and Kolda. A total of 102 communes are included in the 10 regions where rice is grown, indicating that RICOWAS is using a national approach to scale-up CRRP. The 10 regions cover 81% of the territory and include 47% of the population of Senegal. The RICOWAS communes include 2.08 million people, 12.7% of the total population. Total number of project beneficiaries will be 14,245, of whom 57% will be women, growing rice on 6213 ha.

Sierra Leone

The project will establish hubs for CRRP dissemination in 38 communes across 10 districts in the four large Northern, Western, Eastern and Southern regions. The dominant rice growing systems in Sierra Leone are the rainfed lowland system (also called Inland Valley Swamps or IVS), and rainfed systems on large alluvial plains (also known as Boliland). 1.67 million people, which is 21.4% of the country's population, live in the project zone. The project will directly work with 15,000 farmers, of whom 9 % will be women, on 3000 ha. This low number of women is because men do most rice farming in Sierra Leone.

Togo

Project will scale-up CRRP in all five regions of Togo: Maritime, Plateaux, Centrale, Kara, and Savannas, covering the four agro-ecological zones: littoral, forest, humid savanna and dry savanna. The project will focus on irrigated and rainfed lowland systems, working in 31 communes directly with 6,513 farmers, of whom 52% will be women, on 4742 ha. This is 1 % of all rice farmers in Togo, whose total number is 635,223.

Topography, Geology and Soils

The most common soils in the sub-humid zone are Ferralsols and Lixisols but Acrisols, Arenosols and Nitosols also occur. Acrisols are found in southern Guinea, most of Côte d'Ivoire, southern Ghana, Togo, Benin and Nigeria. In the humid zone, Ferralsols and Acrisols are the most frequent while Arenosols, Nitosols and Lixisols are less so. Ferralsols occur widely in Sierra Leone and Liberia. In addition to agroecological zones, the distribution of soils is a function of landscape and other factors such as parent material. The sequence of the main landscape components of inland valleys in West Africa are crests, upper, middle and lower slopes, valley fringes, colluvial foot slopes and, lastly, valley bottoms. The inventory area covered the following countries or parts of them: Benin, Burkina Faso, Côte d'Ivoire, the Gambia, Guinea Bissau, Guinea, Ghana, Liberia, Mali, Nigeria, Senegal, Sierra Leone, and Togo. They reported that soils of the uplands (crests and slopes) are mainly Ferralsols, Acrisols and Lixisols. The latter are the major soils in the northern and central parts of the inventory area (southern Senegal, Gambia, parts of Guinea Bissau, southern Mali, Burkina Faso, northern, central and eastern Ghana, Togo, Benin, and western, central and northern Nigeria). Other soils of the uplands are Nitosols in the coastal terraces and aggradational plains of western Gambia and south-western Senegal, Arenosols, in the northern parts, and Vertisols in Togo,

Benin, Mali, Burkina Faso, and Nigeria. Less frequent are Cambisols and Leptosols on strongly eroded valley side slopes. Soils of the Colluvial Footslopes and Valley fringes are Cambisols, Leptosols, Gleysols, Lixisols and Arenosols.

Hydrology

The water resources in West Africa are composed of 28 major transboundary river basins that range in size from 2,113,350 km² (Lake Chad Basin) to 16,000 km² (Tanoé River Basin), which form an important water network covering all countries in the West African region. The most important are the Niger River Basin (including Benin, Burkina Faso, Guinea, Mali, Niger, Nigeria and Sierra Leone), the Senegal River Basin (including Guinea Mali and Senegal), the Volta River Basin (including Burkina Faso, Benin, Ivory Coast, Ghana, Mali and Togo), the Lake Chad Basin (including Niger and Nigeria), and the Komoé River Basin (including Burkina Faso, Ivory Coast, Ghana and Mali).

Land Use

Agriculture and pastoralism are the most common activities in West Africa. This is reflected in land use where pastoral farming predominantly in terms of covered territory, even if agriculture, particularly in favourable areas (recession areas, inland delta, banks of rivers, wetlands, perimeters arranged for irrigation, etc.) is also practiced by a large section of the population. According to the FAO (2015, 2016), the forest resources of countries in the region will have gone from almost 103 million ha in 1990 to 77 million ha in 2015, an average reduction of 1% per year over the period. Only Ghana has seen an increase in its resources with an average annual rate of 0.3%. This deforestation and degradation of forest resources are fuelled by high population growth and a growing demand for food, agricultural expansion accounts for most land cover change across West Africa (CILSS, 2016).

Terrestrial Flora and Fauna

Due to its geographic scope and its bio-climatological diversity, the area contains a considerably rich ecosystem (forests, savannas, tiger bush, steppes, deserts, etc.), next to its wetlands and marine ecosystem. The various ecosystems, ranging from dry savanna to tropical forest, provide habitats to more than 2,000 amphibians, bird and mammal species (IUCN, 2015). The region's tropical forest, in the Upper Guinean countries, is the main locus for biodiversity. These lowland forests of West Africa are home to 320 mammal species (which represents more than a quarter of Africa's mammals), 9,000 vascular plant species, and 785 bird species (Conservation International, 2008). The Upper Guinean forest is renowned for its primate diversity, with nearly 30 distinct species, and has been identified as some of Africa's most critical primate conservation area[33]

Socio-economic landscape

Demography

Table 2 shows that Nigeria is holding 52% of the population of all 13 countries with 201 million people. Second most populous countries are Ghana, Côte d'Ivoire and Niger, with 30 million, 26 million and 23 million people respectively. While Nigeria and Ghana have the lowest population growth rate (among the 13 countries) with 2.2. % and 2.5%, Niger exhibits the highest population growth rate in West Africa with 3.8%. Niger also has the highest percentage of rural population with 83%, followed by Burkina Faso with 71%, and Guinea with 64% respectively. All RICOWAS countries are in the lowest global group in regard to GDP per capita. Best performance is exhibited by Côte d'Ivoire, Nigeria and Ghana with about 2200 USD, while eight countries (Guinea, Mali, Burkina Faso, The Gambia, Togo, Liberia, Niger and Sierra Leone) have a per capita GDP of less than 1000 USD.

Table 2: Demographic characteristics of the 13 RICOWAS countries

(World Bank Open Data, 2021)

RICOWAS countries	Total population 2019/2020 in Million	Population growth rate 2019 %	Rural population 2019 %	Urban population 2019 %	Fertility rate, births per woman, 2019 Number	Death rate / 1000 lives, 2019 Number	GDP per capita, 2019 US$
Benin	11.8	2.7	52	47	4.8	8.8	1219
Burkina Faso	20.32	2.8	71	29	5.2	8.1	787
Côte d'Ivoire	25.72	2.5	49	51	4.7	9.7	2276
The Gambia	2.35	2.9	39	61	5.2	7.0	778
Ghana	30.42	2.2	43	57	3.9	6.6	2202
Guinea	12.77	2.8	64	37	4.7	8.4	963
Liberia	4.94	2.4	48	52	4.3	7.5	622
Mali	19.66	3	57	43	5.9	9.6	879
Niger	23.31	3.8	83	17	6.9	8.1	554
Nigeria	201	2.6	49	51	5.4	11.8	2230
Senegal	16.3	2.7	52	48	4.6	5.7	1447
Sierra Leone	7.81	2.1	58	42	4.3	11.0	527
Togo	8.08	2.4	58	42	4.3	8.4	679
Total/Average	384.48	2.7	55.6	44.3	4.9	8.5	1166

[33] CILSS (2016). Landscapes of West Africa – A Window on a Changing World.

Human Development

West Africa is a region of rapidly growing populations, poverty, food insecurity, gender inequality, illiteracy, conflict, and political instability with an average development index of 0.46. Most of the countries of the zone are in the category of countries with "low human development" except for Ghana, which is in the category of countries with "average human development". Of the West African countries, two countries (Burkina Faso and Niger) rank in the bottom five countries of the global Human Development Index (HDI), and Mali rank in the bottom 10. Within Africa two of the Sahelian countries (Mali and Niger) are in bottom 10 (of 52) African countries in the Africa Gender Equality Index (AGEI), with only Burkina Faso and Nigeria ranking in the top 50%.

Economy

West Africa's 13 economies are diverse across many dimensions of development, and the region is home to some of the continent's least developed countries34. In 2018, income per capita ranged from $452 in Niger to $2,089 in Nigeria. Nigeria's income per capita was an estimated $2,089, and its GDP was an estimated $409 billion, or about two-thirds of West Africa's total. The country accounts for half the region's population, and its size dominates the region's economic performance. Lower GDP per capita is symptomatic of fragile growth in a region with a growing population. From 2010 to 2017, volatility in output averaged 1.5%, resulting in part from weak economic diversification. Growth rates differ considerably over time and across West African countries. Some countries have experienced high growth, even exceeding 7% in 2017 and 2018. Nine countries saw growth of at least 5% in 2017 and 2018, and four of them (Côte d'Ivoire, Guinea, Mali, and Senegal) have been growing at that rate since 2014–16. Performance in these five fast-growing countries has been driven by agriculture.

Summary of key environmental and social issues in proposed project sites

The results of the questionnaire responded to by the National Executing Entities highlighted common environmental and social issues related to rice cultivation in the region:

Land Access Issue

Security of land tenure remains by certain categories of people (women, youth, elderly, displaced people, refugees, etc.) a challenge in the region, some of whom do not have the right to own land or some of whom do not have the right to access land because of national regulation. Without secure land ownership or at least guaranteed access to land, the application of CRRP will be very difficult, if not impossible in some cases and this could negatively affect the project.

Social Exclusion and Gender inequality

The region has been described as one of the places with high gender inequalities. Women's status and representation may limit their meaningful participation in project activities and benefiting from the outcomes. The project could increase inequalities and put burden on vulnerable groups such as women, youth, etc. Child labour may also occur in rural areas.

Health

Rice farming may lead to an increase in water- and vector borne diseases (such as Cholera or Malaria) and encourage the proliferation of insects near the farms.

High expectation

Managing community expectations for projects is not always an easy task due to the varying composition of project stakeholders and their divergent interests. Individual members may hold different and sometimes unrealistic expectations of the project, if project activities and approaches are not explicitly and transparently explained, and if translations into local languages are not well administered.

Deforestation and land degradation issues

Expanding rice areas because of project activities could result in soil degradation, opening of virgin forest or indirect deforestation.

Pollution

One of the potential environmental impacts is that of incorrect agrochemical use. In the field, the highest risk of pollution is from handling any potentially hazardous chemicals. Some farmers are still over-applying fertilisers and applying them at the wrong time, which might damage rice productivity instead of improving it, and increase nutrient loss from the system.

ENVIRONMENTAL AND SOCIALRISK IDENTIFICATION AND DESCRIPTION

Methodology

The project methodology is based on a systemic approach concept, in consultation with all actors and stakeholders involved, mainly the services of agriculture ministries, research institutions, rural organizations, but also ministries of environment.

The study used a participatory method, which helped to collect progressively the opinions and arguments of all stakeholders. The work plan is based on the following three axes:

- Analysis of projects documents and other strategic planning documents at national and local level: The ESMP has gathered numerous environmental studies realized in the 13 countries, mainly those related to agriculture projects.

[34] AfDB, African Economic Outlook 2019

- Gathering information through a questionnaire from the stakeholders involved in the project: Ministry of agriculture and rural development, agricultural research institutions, rice production organizations, etc.
- Information analysis in the environmental and agricultural (rice) sectors: Screening of all project activities against the 15 principles of the AF.

The collected information helped in the environmental study, which includes initial environmental analysis, impacts identification, grievance mechanism, Environmental and Social Management Plan, including implementation arrangements, training needs and monitoring.

Where risks and potential impacts are identified and if these are unavoidable, suitable mitigation measures will be properly planned to adequately compensate for residual impacts and to provide options for restoration. The methodology builds on two key steps: i) screening to identify specific E&S risks at project level, and ii) assessing the impact of the identified risks.

Screening to identify specific environmental and social risks at the project level

The entire project activities were screened for any E&S risks according to the 15 principles outlined in the AF's ESP. Hence, Table 3 " *Project Activities Screening in accordance with the AF ESP* "only assesses generic activities on potential environmental and social risks. The risk identification protocol is an **ongoing process** that will continue during the project implementation phase to identify and ensure all risks such as USPs are taken into account bearing in mind the beneficiaries' and success as well as sustainable execution of the project. As such, impact identification is still rather preliminary, and the table should be understood as indicative.

N°	Principles
P1	Compliance with the Law
P2	Access and Equity
P3	Marginalized and Vulnerable Groups
P4	Human Rights
P5	Gender Equity and Women's Empowerment
P6	Core Labour Rights
P7	Indigenous Peoples
P8	Involuntary Resettlement
P9	Protection of Natural Habitats
P10	Conservation of Biological Diversity
P11	Climate Change
P12	Pollution Prevention and Resource Efficiency
P13	Public Health
P14	Physical and Cultural Heritage
P15	Lands and Soil Conservation

Table 3: Project Activities Screening in accordance with the AF ESP

Components/Outcome/Output/Activity	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15
Component 1: Strengthen human and institutional capacity in climate-resilient rice production (CRRP)															
Activity 1.1.1.1. Analysis of the impacts of climate change on rice production in West Africa															
Activity 1.1.1.2. Regional validation workshop and dissemination of the regional study		x	x		x										
Activity 1.1.1.3. Development of rice sector adaptation action plans for climate change to be integrated to the Rice Offensive Strategy (ROS)															
Activity 1.1.1.4. Regional validation workshops and dissemination of the rice sector adaptation plan		x	x		x										
Activity 1.1.1.5. Development and dissemination of rice sector briefs and methodologies to integrate climate change adaptation to rice value chain		x	x		x										
Activity 1.2.1.1. Support the development of SRI-CRRP adapted rice growing practices, equipment and tools		x	x		x	x						x	x		
Activity 1.2.1.2. Establishment of a regional technical group to review the advancement of SRI and CRRP best practices		x	x		x										
Activity 1.2.2.1. Undertake capacity needs assessment		x	x	x	x										
Activity 1.2.2.2. Undertake demonstration field visits at national and regional level to share and exchange good practices		x	x		x										
Activity 1.2.2.3. Acquisition of necessary logistics material to support field implementation		x	x		x										
Activity 1.2.2.4. Support the process of upscaling the REE and strengthening its capacities to promote CRRP-SRI in the region															
Activity 1.2.3.1. Undertake Training-of-Trainer (ToT) workshops on SRI, CRRP		x	x		x										
Activity 1.2.3.2. Develop, revise and produce training materials and modules for SRI, SLWM and other relevant technical topics		x	x		x										x
Activity 1.2.3.3. Support farmer field implementation of CRRP by extension institutions with adequate materials and resources		x	x		x	x									x
COMPONENT 2. Assist farmers to scale-up CRRP															
Activity 2.1.1.1. Support the adoption and scaling-up of best practices of SRI in farmers' fields	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs
Activity 2.1.1.2. Promote and assist farmers in executing SLWM practices in association with their SRI fields	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs
Activity 2.1.1.3. Promote and assist farmers in rice seed, rice seedling and organic fertilizer production	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs
Activity 2.1.1.4 Provide farmers with technical expertise to implement best practices for CRRP		x	x		x	x		x	x	x		x			x
Activity 2.1.1.5. Provide farmers access to equipment and tools to implement SRI and CRRP	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs
Activity 2.1.2.1. Develop and test data tracking methodology and mechanism on the implementation of SRI and CRRP															
Activity 2.1.2.2. Implement the baseline study on rice production and value-chain characteristics															
Activity 2.1.2.3. Provide agents of national institutions and extension services, researchers and smallholder rice farmers with the expertise to use the data tracking methodology		x	x		x										
Activity 2.1.2.4. Update the data analysis and CRRP tracking database bi-annually and publish its key performance indicators and results on the project website.															
Activity 2.2.1.1. Establish networks and create partnerships between private companies and producer cooperatives		x	x		x										
Activity 2.2.1.2. Generate PPP for the development and supply of innovative agricultural equipment and their provision to farmers	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs

Activity 2.2.1.3. Generate PPP for threshing, processing, packaging and marketing of climate-resilient rice for vulnerable groups	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs
Activity 2.2.1.4. Generate PPPs for the supply of organic fertilizers and rice seeds produced by smallholder farmers	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs	USPs
Activity 2.2.2.1. Reinforce and assist in the establishment of agricultural associations and cooperatives		x	x		x											
Activity 2.2.2.2. Provide and reinforce advisory services to agricultural associations and cooperatives		x	x		x											
Activity 2.2.2.3. Provide assistance to agricultural associations and cooperative in accessing and managing agricultural credits and subsidies		x	x		x											
COMPONENT 3. Strengthen communication, advocacy and partnerships to scale-up CRRP																
Activity 3.1.1.1. Development of a communication strategy and plan.		x	x		x											
Activity 3.1.1.2. Development of a user-friendly web-based platform for SRI and CRRP methods																
Activity 3.1.1.3. Production of documents, videos, radio shows, maps.		x	x		x											
Activity 3.1.1.4. Organization of knowledge-sharing events and exchange visits at local, national, regional and global level including Asia, Latin America and other parts of Africa.		x	x		x											
Activity 3.1.1.5. Writing, dissemination and presentation of policy and advocacy briefs on climate adaptation strategies and project impact for rice production and its role in adapting to climate change.		x	x		x											
Activity 3.2.1.1. Setting up of operational mechanisms for information-sharing, networking, and coalition-building for the scaling-up of CRRP		x	x		x											
Activity 3.2.1.2. Development of national networks that integrate all SRI and CRRP activities.																
Activity 3.2.1.3. Organization of annual national events on rice and its linkage with climate change in West Africa		x	x		x											

Legend

USPs	Unidentified risk for USP
	Not applicable - No generated risk
X	Risks identified according to the corresponding AF ES Principle

Assessing the impact of the identified risks

Based on the risk screening exercise, Components 1 and 3, mainly focused on studies, revision and development of new policies, capacity building, communication and advocacy are categorized as Low risk (Category C). Component 2 in general where concrete adaption field-based activities will be conducted are categorized as medium risk (Category B). The project activities are designed to induce less possibility of producing negative social and environmental impacts. Therefore, the overall risk ranking for this project has been categorized as Category B.

The E&S principles of the AF that will be triggered by the project in terms of negative impacts and environmental and social risks are presented in the table below:

Table 4 Overview of the E&S Impacts and Risks identified as being relevant to the project

Checklist of environmental and social principles	No additional assessment is required for conformity	Potential impacts and risks - additional assessment and management required for the conformity
Compliance with the Law	**X** *All issues relating to compliance with the law have been checked in Part II, Section E and are described extensively their*	
Access and Equity		**X** *It Is planned to explain explicitly, transparently and unambiguous during the launching process the project targeting and scaling up mechanism translated into the local languages so that everybody will be carried along. In addition, OSS in accordance with its practices and adherence to the AF, makes available to all direct and indirect beneficiaries of the project a grievance redress mechanism that will inform conflict situations and will ensure access and equity to all project participants and beneficiaries*
Marginalized and Vulnerable Groups		**X** *There is some risk in terms of access and equity for women, widows, youth, refugees, internal displaced people and people living with disabilities measures are required.*
Human Rights	**X** *The IE and its partners affirm the fundamental human rights of all people. The project does not risk violating any pillar of human rights.*	
Gender Equity and Women's Empowerment		**X** *Women are less likely to have the ownership of agriculture land and have less land tenure security than men. Gender Assessment and Action Plan has been developed with a special focus on women and youth groups especially for capacity building, leadership in rice producer organisation to ensure that they fully participate and benefit from the project.*
Core Labour Rights		**X** *Follow-up will be ensured by the EEs to comply with the international labour standards including child labour.*
Indigenous Peoples	**X** *In project intervention areas, no indigenous people or tribes were noted, and thus not be affected by the project activities.*	
Involuntary Resettlement	**X** *The project will work with communities in their locations and on voluntary basis. Therefore, no resettlements or even displacement to new locations is expected. The project benefits will occur at the individual plot.*	
Protection of Natural Habitats	**X**	
Conservation of Biological Diversity	**X**	
Climate Change	**X**	
Pollution Prevention and Resource Efficiency		**X** *The development of rice perimeters at national scale may cause an accurate use of pesticides, to struggle against pests and diseases.*
Public Health		**X** *Ebola outbreak in Guinea constituted a high risk that can hamper the displacement across borders and abroad*
Physical and Cultural Heritage	***X***	
Lands and Soil Conservation	**X**	

Principle 1: Compliance with the law. Screening result: **No risk**
Explanation: The proposed project has been developed in alignment with a number of national and regional priorities, laws, policies, plans, and national technical standards underpinned in Part II, Section F. The project activities are mainly focused on capacity strengthening, advice and support for rice producers who are willing to apply good techniques for sustainable land and water management in line with the applicable national regulations and laws. Land ownership is a crucial issue in the ECOWAS region, to this no activity that could lead to the expropriation of land is planned. In order not to harm people who do not have access to land, the consultations organized at the level of each country have recommended the development of criteria. Principle 2 related to access and equity describes this process.

Principle 2: Access and equity Screening result: **Low risk** (in relation to activities under Output 1.1.1, Output 1.2.1., Output, 1.2.2., Output 1.2.3., Output 2.1.1., Output 2.1.2., Output 2.2.1., Output 2.2.2., and Output 3.1.1.)
Explanation: Rural people and marginalized poor families who are not often integrated in the local politics and decision-making processes, but they are the ones targeted by the project. It could therefore be a risk of insufficient access of the project resources by these people. The consultation workshops the 13 countries have mainly highlighted the risk of the very high expectations of the communities and the misunderstanding of the project scope. Land tenure including lack of land ownership of certain categories of people (women, young, elderly, displaced people, refugees, etc.) have been identified as a potential risk that could lead to the exclusion of those who do not own land or who do not have the right to access land because of local rules or national regulation. Widows and divorced women have virtually no tenure or inheritance rights with which they could ensure their own food security or the food security of their children. In certain cases, women may have access to land as gifts from husbands and fathers.

As mitigation measures, it has been suggested during the consultation process (i) to explain during the launching process of the project about project targeting and scaling-up mechanism applied in very an explicit, transparent and unambiguous manner. This should be translated into the local languages so that everybody will be appropriately informed; (ii) to provide priority to marginalized people who do not have land access or might be able participate in other project activities such as PPPs; (iii) to develop selection criteria to be agreed with all the stakeholders. According to population dynamic in the ECOWAS region, this approach will ensure that the project provides fair and equitable access without discrimination to all beneficiaries including the most marginalized and vulnerable groups.

The process of identifying project beneficiaries involves (i) the formulation of selection criteria and priorities and (ii) consultations with rice producer organisations and local authorities as well as potential communities. Selection criteria will consider practicality and feasibility, willingness to apply the project approach, exclusion from other previous development initiatives, potential synergies with other current development initiatives, inclusion of women and the presence of committed youth. Based on recommendations aligned to selection criteria targeted communities will be consulted and based on their potential and commitment a final selection considering the achievement of project outcomes/results will be made; and this again is subject to committed support and approval by the rice producer organisations and local authorities.

Communities and beneficiaries will be comprehensively sensitized to enhance priorities of the most vulnerable groups while ensuring their participation into decision-making and equal access to the project benefits. In addition, and as usual, OSS in accordance with its practices makes to all direct and indirect beneficiaries of the project a grievance mechanism available that will inform about conflict situations and will ensure access and equity.

Principle 3: Marginalized and vulnerable groups Screening result: **Potential risk** in relation to activities under Output 1.1.1, Output 1.2.1., Output, 1.2.2., Output 1.2.3., Output 2.1.1., Output 2.1.2., Output 2.2.1., Output 2.2.2., and Output 3.1.1.)
Explanation: Many West African countries are prone to recurrent terrorist attacks and political instability leading to the displacement of people inside or outside the country especially in Burkina Faso, Mali, Niger and Nigeria. The table below summarizes the situation in the region:

Country	Refugees & Asylum Seekers	Internally Displaced people
Burkina Faso	22,078	1,218,754
Mali	48,547	346,864
Niger	240,728	300,320
Nigeria	304,562	1,920,000

Source UNHCR on April 30, 2021 (Situation Sahel Crisis (unhcr.org))

This very volatile situation in the project's intervention area risks increasing the marginalization of these people, excluding them from the benefits of the project or affecting them by certain planned activities. Women and youth represent the vast majority of the population in most countries in the Sahel. They are a highly vulnerable group and strongly affected by poverty in the Sahel region. The impacts of climate change on this group have consequences for the whole region. The consultation workshops have highlighted that women, widows, youth, refugees, internal displaced people and people living with disabilities are the main marginalized and vulnerable groups in the region. These peoples are the unlikely to have access to land and to participate actively in the project.

To mitigate this risk, these vulnerable/marginalized groups such as women, youth and displaced people representatives have been considered during the design of the project. A gender study has been established for a better understanding of

the social construction and dynamic is the areas. As a result, the project components were designed to encourage the participation of marginalized and vulnerable groups and to develop specific activities are targeting women and youth.

A deeper consultation and additional assessment will be carried out during the baseline and the capacity needs assessment in the inception phase to avoid exclusion of marginalized groups and to minimize potential impacts related to the project activities. In order to avoid the exclusion of these communities all activities implementations must be decided in common with consultation of all concerned communities.

Principle 4: Human rights Screening result: **No risk**
Explanation: The targeted countries recognise fundamental human rights and freedom without discrimination because of race, national origin, colour, religion, opinion, belief, or sex. The project activities will not engage in any activity that may result in the infringement on the human rights of any person during implementation. The proposed project respects and adheres to all relevant conventions on human rights, national and local laws and both countries are also part of various human rights treaties. The planned activities are not discriminatory by tribe, age and gender or, level of education. The project design relied on the consultative approach involving various stakeholders. No activities are identified whose execution is not in line with the established international human rights. Project objectives promote basic human rights for fair and equitable access to resources to enhance their resilience to climate change in the beneficiary countries.

Principle 5: Gender equality and women's empowerment Screening result: **Potential risk** (in relation to activities under Output 1.1.1, Output 1.2.1., Output, 1.2.2., Output 1.2.3., Output 2.1.1., Output 2.1.2., Output 2.2.1., Output 2.2.2., and Output 3.1.1.) with mitigation measures as the project has built-in targets and indicators for the inclusion of women in its results framework.
Explanation: Women's status and representation may limit their meaningful participation in project activities and benefiting from the outcomes. Indeed, women throughout the region face numerous challenges that either are more severe than those faced by men, or that men don't face, including access to land, finance, vulnerability to climate change and the ability to recover quickly from shocks.

In the ECOWAS region, men and women do not have equal access to land, even where legislation has removed gender barriers to land ownership. In most situations, women's access to land and other property generally occurs through a male relative in local areas. In common with the gender division of labour, the gender division of private property is regarded as natural, and therefore not to be questioned. Women's effective exclusion from the possession and control of land is largely the basis of their subordination and dependence on men in local communities. As in most of 'patrilineal' Africa, the usufruct right to land prevails and customary land use practices often determine access to land in terms of \ the farmers. However, there is a risk that there could be exploitation of marginalized people providing their labour to the project. Noting that the risk is low, since the 13 countries have ratified the international labour standards and transposed into law all eight fundamental conventions of the International Labour Organization.

Women in rural agricultural labour markets are disadvantaged compared with their male counterparts even though they constitute a significant proportion of family workers. They are less likely to engage in wage employment than men, and when they do, they are more likely to hold part-time, seasonal and/or low-paying jobs in the informal economy. These issues emerged clearly during stakeholder consultative meetings.

In addition, there is a risk of late or unpaid salaries or remuneration non- compliant with the countries' labour legislations and laws. During the consultations where national and regional stakeholders have been involved, the core labour rights have been highlighted to ensure that labour legislations are adhered to. Consequently, child labour will be forbidden as well as remuneration inequity between men and women. It is also planned to ensure that all of the labour involved will be wages according to best common practices in the districts and villages

Principle 6: Core labour rights Screening result: **Potential risk** resulting from activities under Output 2.1.1
Explanation: The project does not have any activity that poses a threat to the rights of the farmers. However, there is a risk that there could be exploitation of marginalized people providing their labour to the project. Noting that the risk is low, since the 13 countries have ratified the international labour standards and transposed into law all eight fundamental conventions of the International Labour Organization.

Women in rural agricultural labour markets, they are disadvantaged compared with their male counterparts even though they constitute a significant proportion of family workers. They are less likely to engage in wage employment than men, and when they do, they are more likely to hold part-time, seasonal and/or low-paid jobs in the informal economy. These issues emerged clearly during stakeholder consultative meetings.

In addition, there is a risk of late or unpaid salaries or remuneration non- compliant with the countries' labour legislations and laws.. In West Africa, thousands of children are engaged in hazardous activities in rice farming, including clearing fields, working in flooded fields, and applying pesticides. While most of the children work alongside their families, others have no family relationship with the farmer and have been recruited for the season. During the consultations where national and regional stakeholders have been involved, the core labour rights have been highlighted to ensure that labour legislations are adhered to. Consequently, children's labour will be forbidden as well as remuneration inequity between men and women. Awareness raising on the danger and impacts of worst forms of child labour will take place as part of the sensitizations and training session It is also planned to ensure that all of the labour involved will be wages according to best common practices in the districts and villages

Principle 7: Indigenous people Screening result: **No risk**
Explanation: In West Africa, several groups identify as indigenous peoples due to their historic occupation of the Sahara and the Sahel, their continuous adherence to economic and cultural systems of pastoralism and their ongoing marginalization from the political economy. These peoples include the Tubu, the Fulani, and Bassaris. During the full project development process, a data collection questionnaire was developed and shared with the thirteen countries. The tool has allowed the identification of the ethnic groups in each of project intervention area (link). The assessment of the data led to the identification of socio-professional groups rather than indigenous people or tribes in the project areas. Thus, the project will not affect any indigenous group but will promote the respect of the rights and responsibilities set forth in the United Nations Declaration on the Rights of Indigenous People. It should also be noted that the project will consider the most vulnerable and marginalized groups as well as people living with disabilities. The consultative approach will be a continuous process during activities execution and the FPIC process will be applied throughout the whole project duration.

Principle 8: Involuntary resettlement Screening result: **No risk**
Explanation: The project will work with communities in their locations on a voluntary basis. The SRI / CRRP practices will be part of communities' normal cultivation process and will not cause a delay in cultivation or constitute a constraint in access to land and assets. Even in the absence of the project, the farmer will apply his traditional method and receive his usual earnings. Therefore, with the approach supported under this project no physical and economic displacement is foreseen, and impact will be nil. The project benefits will occur at the individual plot.

Principle 9: Protection of Natural Habitats Screening result: **Potential risk** (in relation to activities under Output 2.1.1)
Explanation: The project will be implemented on thousands of sites spread across the ECOWAS region. Despite this large geographic coverage, the site selection criteria applied by the countries took into account, among other things: the fragility of the ecosystem, the presence of a protected area, national or international interest areas. The project will undertake the CRRP/SRI technique in the already existing individual farmers' fields and plots. Adopting the SRI technique is voluntary by the rice farmers and will be applied on their own lands. The gains through the adoption of the technique are so important that they could lead some people to convert other lands to rice cultivation.
Despite these measures, the greatest risk identified during the consultations are that the activities may lead expanding the farms to wetland areas (especially mangrove), resulting in degradation and wetland removal, as well as the degradation of riverbanks. In addition, the proposed project will be undertaking commercialization of harvested rice and its sub-products. It will also organize demonstration and trainings sessions directly in the field, which may present a slight risk for the surrounding natural habitats. Degraded areas will be restored with natural vegetation in case that will happen.

As mitigation measures, it is planned to (i) include training on sustainable land development and soil preparation methods including zero or minimum tillage, (ii) organize awareness trainings to discourage conversion of virgin forest to crop land, and to prevent people from draining mangroves for rice paddies and vegetable farming.

Principle 10: Conservation of biological diversity Screening result: **Potential risk** (in relation to activities under Output 2.1.1)
Explanation: As part of the implementation of the project, new agricultural practices, may represent a form of disturbance for the flora and can affect the biological diversity. Although, the protection of ecosystems and their biological diversity are an essential objective of the project, converting land for rice production may affected the biological diversity. The training modules will be developed in order to guide the populations in the selection of new lands for rice cultivation to avoid the negative effects on the environment. In fact, CRRP as a methodology protects, improves, and regenerates the natural resources and does not imply the introduction of a new invasive species. The project implementation will result in a multitude of environmental benefits, including improved soil health, water-saving, reduced emissions in greenhouse gases, reduced use of chemical fertilizers and pesticides, and improved biodiversity.

During the implementation, follow-up and monitoring of the execution of activities related to the protection and management of ecosystems will be undertaken. In fact, pre-surveys of the proposed areas will be conducted to avoid sensitive habitats that have high diversity of flora and fauna. Promotion of awareness sessions, capacity building and exchange visits to strengthen the efficient management of natural resources will also be undertaken.

Principle 11: Climate change Screening result: **No risk**
Explanation: Rice farming is one of the GHG emission sectors and the project may increase that. Proposed project activities aim to enhance the resilience of ecosystems and populations to climate change through improving the resilience of rice production with the implementation of the CRRP/SRI technique. Training session on how to apply the alternate wetting and drying irrigation methodology for rice paddies to reduce CH4 emission and how to improve nutrient management, including the retention of rice residues, are in fact essential components of the CRRP approach.

Principle 12: Pollution prevention and resource efficiency Screening result: **Potential Risk** (in relation to activities under Output 2.1.1)
Explanation: Intensification of agricultural production most often increases the use of pesticides and chemical fertilizers. In the absence of a regulated and integrated approach for pest and diseases management, the efforts for increasing rice production could expand the use of harmful pesticides. The use of chemicals is targeted to control various pests, fungal and bacterial diseases, and other crop pests. In zones with irrigated rice production, water will accumulate and carry the agricultural pesticides and various toxic residues. The Use of fertilizers may contribute to water pollution, soil salinization, alkalisation and acidification. In addition, minor risks related to rice harvesting, threshing, milling, parboiling, storing and commercialization of rice by polluting soils or creating wastewater or solid waste are also possible.

As mitigation measure, the project intends to promote efficient use of natural resources and to help farmers to adopt new agricultural practices such as improved soil management, practices that strengthen the resilience to climate change emphasized under output 2.1.1. The planned activities will not generate pollution and loss of resources. To the contrary, it will contribute to sustainable land management, efficient water use and prevention of water pollution. Because SRI plants are healthier and stronger and the humidity in the plant canopy is reduced, pest and disease attacks decline, and pesticide use can be limited or omitted entirely. Furthermore, the use of chemical fertilizers and pest control will not be encouraged or supported by the project, but instead manure, compost and organic pest control remedies will be promoted.

Principle 13: Public Health. Screening result: **Potential risk** (in relation to activities under Output 2.1.1)
Explanation: Rice farmers are usually prone to water-borne diseases. Rice cultivation may lead to an increase in water- or vector-borne diseases (such as cholera and Malaria), and in the proliferation of insects near the farm. It is mandatory to raise awareness and support mechanisms to implement awareness for disease management and control, especially for Malaria and Bilharzia. If the project did not take proactive measures, this could have negative impacts on public health. This project will contribute to improve health conditions of the rice farmers and communities with the CRRP/SRI technique where irrigation water use is optimized and reduced up to 50%. The increased income generated by the introduction of the SRI technique can be used for other household needs such as schooling the children, accessing health care, and/or investing in other economic activities.

Ebola outbreak in Guinea constituted a high risk that can encourage the displacement across borders and abroad. The project has been developed in line with the national sanitary regulations related COVID-19 and provision has been made to cope with other disasters such as Ebola during the implementation phase.

Principle 14: Physical and cultural heritage Screening result: **Potential Risk** (in relation to activities under Output 2.1.1)
Explanation: Expanding rice farms may lead to the loss and disturbance of cultural resources such as sacred forests and archaeological sites. In regard to cultural heritage, the introduction of new rice farming practices may experience some resistance from communities and the Chief. The project aims at enhancing the know-how of the rice farmers and supporting them in adopting CRRP/SRI as an innovative methodology that builds on traditional and local knowledge and is reinforced by ecological best practices.

Consultation process will continue during the implementation of the project through awareness campaigns to communities on how the CRRP/SRI as an innovative methodology will enhance the traditional knowledge and lead to increased incomes.

Principle 15: Land and soil conservation Screening result: **No risks**
Explanation: The region's landscapes are affected by degradation, particularly in the fast-growing agricultural lands where natural vegetation cover has been removed, and fragile soils have been exposed to wind and water erosion. Since 1975, West African forests have declined from about 131,000 sq. km to just 83,000 sq. km. Much of that deforestation was driven by agricultural expansion, which doubled in area between 1975 and 2013. Traditional rice production is characterized by soil degradation and clearing of virgin forests or land. Through the approach proposed under CRRP, no damage to soil, vegetation and land resources are expected to occur. Sustainable intensification of land will reduce the need for further deforestation. Besides, SRI-CRRP is an agro-ecological and climate-smart agriculture approach that promotes land and soil conservation. In fact, by reducing the use of irrigation water by up to 50%, soil aeration is supported, which stimulates the root growth of the rice plants. Additionally, through organic matter-enriched soils, nutrient and water holding capacity in soils are improved, more carbon is stored, and beneficial soil biota support crop nutrient uptake and protect against disease. In addition, the project will undertake awareness raising on the impact of deforestation on the landscape and on agriculture.

Cumulative Impacts of the Project

In the long-term, the project has the potential to have an impact concurrent with other third parties the same resources which could result in a number of cumulative impacts, such as: i) deforestation due to the exploitation of forest resources to be converted into rice production, and ii) waste production due to multiple waste and dumping sites from uncoordinated organic fertilizer management.

The ESMP proposed by the project will ensure through monitoring that activities and their outputs meet permissible limits under national law and international best practice. The project will oversee to reduce negative impacts by implementing mitigation measures. The consultation with communities will be part of the ESMP monitoring to ensure that the impacts of planned project activities are well recorded and reported.

Unidentified Sub-Projects (USP): Methodology of Impact Assessment and Risk Management

Compliance with Adaptation Fund policies

All activities implemented under the USP modality will adhere to the AF Policies to which the RICOWAS Project is subject to. These policies include: (i) The Adaptation Fund Environmental and Social Policy rev. March 2016 (AF ESP), which sets out the requirements for IEs to assess and manage environmental and social risks in project implementation. The AF ESP defines the E&S Principles that AF projects abide by as well as defining the adoption of measures to avoid, or where avoidance is impossible to minimize or mitigate those risks during implementation. Any USP identified and implemented in the RICOWAS Project will, without exception, comply with the E&S Principles defined in the AF ESP ; (ii) The Adaptation Fund Gender Policy and Action Plan March 2016 (AF GP), which defines the objectives and principles that AF funded projects shall comply with in order to secure the uphold of women's rights as universal human rights, and in order to attain the goal of gender equality and the equal treatment of women and men. Any USP identified and implemented in the RICOWAS Project will, without exception, comply with the Main Principles defined in the AF GP.

The USP Policy for RICOWAS is furthermore informed and guided by the AF Guidance Document, published on May 2021, stating "*Further Compliance with the Environmental and Social Policy and the Gender Policy of the Fund: Update of the Project/Programme Performance Report and guidance for unidentified sub-projects*" (AFB/B.32-33/7).

Compliance with OSS Environmental and Social Safeguards

The Environmental and Social Safeguards (ESS) of the RICOWAS Project, and inherently for the USPs, are assured through OSS policies and procedures which are based on the International Finance Corporation (IFC) Environmental and Social Sustainability Framework. This ensures that potential risks and impacts are iteratively identified, mitigated and monitored throughout the life-cycle of the Project.

The Environment and Social risk management is completed through two main stages: (a) Preliminary Risk Screening with respect to the ten Performance Standards (PS) prescribed in OSS E&S policy that all projects should comply with. This phase is implemented during project preparation and leads to a categorization of the project according to its risk level; (b) On-going Risk Screening of the project interventions during the implementation phase. Activity-wise risk management is governed by OSS' risk management procedure which is in line with the internationally recognized standards, and more specifically the ISO 31000:2009, Risk management - Principles and guidelines.

Operational procedures will be implemented to ensure a continuous screening of all project activities and interventions for the identification of arising risks and impacts.

Adherence to National Technical standards

Equally, for the compliance with the AF ESP and GP, with OSS ESS, and in line with these, the RICOWAS project is compliant with national laws, and adheres to all National Technical Standards that are applicable to the project. As such, all activities implemented as USPs will comply with these laws and standards.

All national laws and technical standards identified during the development of the FP and are applicable to the RICOWAS project have been listed in tables 19, 20, and 21 and will be subject to updating if and when necessary for activities with USPs. Any USP identified and implemented in the RICOWAS project will, without exception, comply with the identified national laws and technical standards of the 13 project countries. The USPs environmental screening and potential ESIA should be in line with the national laws and regulations as the activities will be executed at national level. If some of the USPs requires detailed assessments or specific ESIA the involvement of national authorities in charge of these aspects will be ensured.

Unidentified Sub-Projects (USPs) in the RICOWAS Project

The USP policy applies to activities that have been identified as USPs, and of which the detailed scale, scope and location, and other technical aspects are not yet fully identified at the time of full proposal development.

For the RICOWAS project, the USP policy will be applied to: (a) all activities related to the promotion and implementation of SRI and CRRP practices (activities under outcome 2.1); (b) activities related to the establishment and reinforcement of public-private partnerships and agricultural associations and cooperatives (activities under outcome 2.2).

As mentioned in the section (Part II.A), a rich database is already available and was developed under the SRI-WAAPP project that will also be elaborated further during implementation. This database is the results of the baseline assessment and various studies and reports previously developed. Also, as part of the project development process, baseline data was collected and verified through a detailed questionnaire specific to the planned project activities. In the same framework, activity 2.1.2.2 is one of the first activities to be carried out after the project launch. This will have a determining role in the USP protocol as it will provide and identify the details and modalities to be respected and implemented to ensure the successful execution of all project activities, especially those identified as USPs during the development of the project document.

Once the necessary clarifications and details related to the implementation of the activities identified as USPs have been provided through Activity 2.1.2.2, the EEs will conduct a specific and detailed environmental, social and gender assessment moving forward. This assessment will be done in accordance with national regulations and standards for conducting an assessment such as an EIA and under the supervision of OSS to ensure compliance with OSS and AF safeguards. The costs related to the environmental, social and gender assessment will be charged on the budget line of each activity as stated in the project detailed budget.

Procedures for identification and validation of USPs

Overall, in the ESMP for the RICOWAS project, procedures are defined in case significant risks are identified. As such, when impacts or risks are determined, activity-wide E&S assessment will be conducted which, in turn, will lead to the identification of activity-specific E&S management measures that need to be incorporated into the project execution. Identification, treatment and monitoring of identified risk and mitigation measures will be managed using a Risk Register. The process will be governed by the Risk Management Procedure of the AF and OSS.

Throughout all the project's phases, OSS will ensure a thorough identification of all the risks related to the USPs according to the 15 ESP. The identification and validation process will be launched during the different stages of project implementation. This aspect will be included in the different official project documents such as i) the project implementation manual (a chapter listing the responsibilities of the executing entities for this aspect and guidelines in line with OSS and AF standards and requirements will be formulated ; ii) the Procurement Plan (PP) and Annual Work Plan and Budget (AWPB) (a budget will be clearly identified for these activities) ; iii) the Terms of Reference for the recruitment of consultants/firms

for the elaboration of the different studies and iv) the concept notes of the workshops/trainings and meetings related to activities that includes USPs. Also, during the different supervision and audit missions that OSS will conduct in the project countries, the national and local project teams will be sensitized to this aspect.

During the assessments process to be undertaken in each specific project location for all USP for all ESP principles, a particular attention will be given to the identification of marginalized and vulnerable groups (beyond women and youth), indigenous people, ethnic groups, and socio-professional groups as well as child labor and SLM considerations.

For each Unidentified Sub-Project, ESIA will be carried out to predict and assess the potential environmental and social impacts and design appropriate mitigation, management and monitoring measures. The process will be in compliance with national standards, AF and OSS Policies and will include the following steps:

- **Screening**: It is a tool for predicting, understanding and assessing potential sub-project/activity impacts. In other words, it aims to determine if a sub-project/ activity is likely to have significant environmental and social effects. Aligning with the 15 principles of the AF, the purpose of Screening is to determine whether or not an EIA is required;
- **Scoping**: If a full ESIA is required, scoping establishes the studies that will be required as part of the ESIA process including the identification of data availability and gaps. It determines the appropriate spatial and temporal scopes for the assessment and suggests suitable survey and research methodologies;
- **Impact Prediction and Evaluation**: This is the main part of the ESIA and involves analyzing the impacts identified in the scoping to determine their nature, temporal and spatial scale, extent and effect. Impact analysis requires input from relevant experts, including agronomists, ecologists, biologists, sociologists and economists. Once the potential impacts are fully understood, it is necessary to judge the significance of each impact, to determine whether it is acceptable, requires mitigation or is unacceptable. Consultations with local stakeholders is vital at this stage, and particular attention should be given to vulnerable and disadvantaged communities and risks arising from involuntary resettlement. Successfully identifying and addressing significant impacts at this stage can be key to obtaining both a formal and informal license to operate;
- **Mitigation**: aims to eliminate or reduce negative sub-project/activity impacts through suggesting appropriate measures;
- **Environmental and Social Management Plan (ESMP) and its monitoring**: Also called an Environmental Action Plan (EAP), it defines resources, roles and responsibilities required to manage sub-project/activity impacts and implement mitigation measures. The ESMP forms a link between the ESIA and the Social and Environmental Management System/entity. The central elements of a ESMP should include a detailed description of the activities planned to mitigate impacts, a time line and identification of resources to ensure the ESMP can be delivered, and a communication plan that indicates how progress in the implementation of the mitigation measures will be disclosed. The ESMP should also define monitoring requirements or indicators to determine whether mitigation is successful or needs to be improved or changed;
- **Evaluation**: Also called The Environmental Impact Statement (EIS), is the physical report on the ESIA process and findings. The EIS should provide a clear review of potential impacts and how they have been or will be mitigated. The report often forms the basis of public consultation activities and is the document that is presented to regulatory authorities as the basis for decision making.

USPs exclusion criteria:

The approval of Unidentified Sub-Projects will be based on the application of the above described methodology. This will include the assessment of technical, economic, social, and environmental compliance with AF and OSS policies. Furthermore, in accordance with AF guidelines to define exclusion criteria for USPs, OSS takes into account the following:

- **Modified seeds:** It will be recommended to avoid the use of genetically modified seed varieties. Indeed, when applying the USPs protocol, the choice of seed varieties will be based on (i) the standards in force at the country level such as the official catalogue of species and varieties approved by each country (ii) the preferences of the farmers in each country (iii) the use of varieties resistant to drought, diseases and salinity (iv) the food preferences in each region (iiv) the use of local resilient seeds.
- **Water irrigation techniques**: The CRRP-SRI approach is a water efficient technique. The application of water-intensive irrigation techniques will be excluded in the framework of this project's activities. There will only be the promotion of resilient irrigation techniques. To this end, storage tanks and wells will be installed to support rice farmers for irrigation in the project intervention areas. These infrastructures will be screened according to the USPs methodology and non-viable will be avoided.
- **Energy-intensive irrigation techniques:** The project will promote the use of Renewable Energy (RE) sources for irrigation activities (pumping and others). The application of the USPs methodology described above will exclude the use of non-renewable energy sources, which will create potential environmental and social risks, and will ensure a thorough assessment of the potential risks that may arise from irrigation activities.
- **Irrigation with poor quality water:** Knowledge of the rate of decrease of nutrients from soils resulting from poor water quality application is essential for long-term planning of rice crop production while minimizing the impact on groundwater quality. In light of the above, a USP will not be characterized and categorized as a USP

based on the use of poor water quality as this is a regional project with shared aquifers and shallow ground water.

- **Use of heavy machinery:** Based on USP categorization, heavy machinery will not be considered and the application of EIAs during project implementation will be taken into account as part of the ESMP developed and baseline to be updated accordingly. Impacts such as soil compaction leading to increased density of the soil, reduced air volume and a reduced ability to drain off surplus water as well supporting terraforming leading to land dereliction will be avoided.
- **Land Tenure System (LTS)**: No USPs that requires land acquisition with significant resettlement impact, will be eligible for support under the RICOWAS project. To minimize land acquisition and its impacts: (i) the consultative process that is constantly ongoing and a collaborative approach to identify the suitable spots to be utilized for the SRI practices will be strengthened, (ii) there will be negotiated agreements with beneficiary farmers/affected owners and communities for usage of land, and (iii) there will be no significant adverse environmental or social impact from the USPs. The project will thus consider this LTS and apply it where necessary but not limit it as a USP due to the fact that the 13 countries have different systems taking into account the administrative angle.
- **Displacement of populations**: A wide and well-structured consultative process involving local authorities, communities and marginalized groups representatives already done during the project development phase will be implemented. This will be the approach RICOWAS project is adopting to avoid displacement and livelihoods loss during execution of project activities and USPs taking into account the AF standards and the ESMP.
- **Areas affected by acute social conflicts**: At the project inception phase the baseline study will among others assess the security aspects in the project zones and will refine the selection criteria of site selection to avoid areas where social conflict could impede the execution of the project activities. Thus the USPs in such areas will not be considered.
- **Use of chemical fertilizers and bio-pesticides**: The SRI-CRRP practices are promoting the use of organic fertilizers and bio-pesticides. To this end, under activity 2.1.1.3. and activity 2.2.1.4 the project will assist farmers in promoting the production of organic fertilizers by farmers and will establish PPPs to ensure the sustainability and viability after the project end. Given that the composting technique and location of the production unit is not yet known the project will ensure the compliance with the AF and OSS ES standards using the USPs compliance methodology and will avoid the techniques that could have any negative environmental and social impact.

Project-level Grievance Mechanism

The proposed project will utilize the existing OSS grievance mechanism to allow affected populations to raise concerns that the proposed project is not complying with its social and environmental policies or commitments.

OSS has established grievance mechanism through its grievance procedures, which is an independent mechanism whereby those who have suffered injury, resulting from a project financed or implemented by the OSS may file a complaint. The grievance mechanism, which is made available to stakeholders in OSS website, is part of the environmental and social policy to address compliance as well as lodging USPs identified and grievance cases that may arise during implementation by OSS where a public guideline defines the complaint resolution mechanism. It aims to establish an effective dialogue between those affected by the financed project and all interested parties, to resolve the problem(s) at the origin of a request, without seeking to assign responsibility or fault to any of these parties. This mechanism meets the following criteria:

- Legitimate: enabling trust from the stakeholder groups for whose use they are intended, and being accountable for the fair conduct of grievance processes;
- Accessible: being known to all stakeholder groups for whose use they are intended, and providing adequate assistance for those who may face particular barriers to access;
- Predictable: providing a clear and known procedure with an indicative time frame for each stage, and clarity on the types of process and outcome available and means of monitoring implementation;
- Equitable: seeking to ensure that aggrieved parties have reasonable access to sources of information, advice and expertise necessary to engage in a grievance process on fair, informed and respectful terms;
- Transparent: keeping parties to a grievance informed about its progress, and providing sufficient information about the mechanism's performance to build confidence in its effectiveness and meet any public interest at stake;
- Rights-compatible: ensuring that outcomes and remedies align with internationally recognized human rights;
- A source of continuous learning: drawing on relevant measures to identify lessons for improving the mechanism and preventing future grievances and harms;
- Based on engagement and dialogue: consulting the stakeholder groups for whose use they are intended on their design and performance, and focusing on dialogue as the means to address and resolve grievances.

At OSS level

The grievance mechanism is coordinated and managed by the OSS environmental and social committee (OESC). Affected communities and other stakeholders which will be affected by the project can submit complaints to the OSS, the IE of the present proposal, by mail, email, fax or phone at the address. If necessary, complainants may also refer the matter to the Ad hoc Complaint Handing Mechanism (ACHM) of the Adaptation Fund.

Sahara and Sahel Observatory Boulevard du Leader Yasser Arafat BP 31 Tunis Carthage	Adaptation Fund Board Secretariat Mail stop: MSN P-4-4-400 1818 H Street NW Washington DC 20433

1080 Tunisia Tel: (+216) 71 206 633/634 Fax: (+216) 71 206 636 Email: doleances@oss.org.tn or boc@oss.org.tn	USA Tel : 001-202-478-7347 Email : afbsec@adaptation-fund.org

At the project level

The National Executing Entities are the contact point for any project related complaints from stakeholders in each country. The national project management, with the support from the Regional Executing Entity, should respond promptly and appropriately to a complaint with a report made to the OESC. Where the complaint cannot be managed at the project level, the NEE or REE will direct the complainants to complete a complaint form for submission to OSS. The complainants will be advised to provide complete information, so OSS can properly assess and address the complaint. It will be the responsibility of the NEE and REE, under the control of OSS, to ensure that all relevant stakeholders are adequately informed of the grievance mechanism. This mechanism will be made available and widely diffused during the launching workshops and during the meetings and trainings. The guideline of grievance mechanism will be made available on the project and the regional executing entity website (CRoS-RICE/IER). The procedures on how to submit the complaint are available on the website of the OSS or directly at Guide traitement doleances. If the OESC finds that a complaint is eligible, the OESC composes an internal and/or external expert team to investigate the case and propose options for the complainant to consider.

Table 5: Main channels per country

Country	Complains reception
Regional	Institut d'Economie Rural Rue Mohamed V Bamako Tel (+223) 20223775 Website : www.ier.ml
Benin	(1) National Platform of Professional and Farmers' Organizations (PNOPPA) (2) Platform of Civil Society Actors in Benin (PASCiB)
Burkina Faso	(1) Village Committees
Côte d'Ivoire	(1) Producer organizations; (2) Local authorities
Gambia The	(1) Farmer to extension agent; (2) Extension agent to RAD
Ghana	(1) Community chiefs/palace (2) Community assembly members
Guinea	(1) Community radios (2) Village meetings
Liberia	(1) Community chiefs/palace (2) Community assembly members
Mali	(1) Local authorities (Town hall, Regional/Provincial Councils)
Niger	(1) Local authorities, (2) Technical services
Nigeria	(1) Local authorities
Senegal	(1) Administrative authorities, (2) Customary authorities
Sierra Leone	(1) Local authorities
Togo	(1) Community chiefs/palace, (2) Justice

This should be updated during the launching workshops

Comments and complaints management is an essential part of any structure or organization's commitment to be accountable to its stakeholders. From this point of view, the project will undertake information and awareness sessions for communities and other stakeholders to let them know about the availability to take any action, if necessary, to improve the quality of its intervention and improve the level of social acceptability.

Complaint Handling Process:

Filing a complaint: Any person or community affected by the project activities can file a complaint or claim through several forms and in several ways. In accordance with the principle of accessibility and depending on the context, the method of filing complaints will be diversified: *i) At the national or regional level,* complaints will be addressed directly to the OSS or to the AF via the contacts presented above and via social networks; and *ii) At the local level,* complaints can be addressed to local authorities or the NEEs. Contacts of NEEs and REE will be made public at the beginning of the project execution.

The mechanism will use all possible means and channels (traditional and modern) to receive complaints or claims (anonymous or not). These will include, among others: i) telephone calls, ii) self-referral during supervision missions, iii) facts noted during meetings or field visits, iv) use of social networks (WhatsApp, etc.), project website, project email address, OSS website, or v) mailed letters that can also be deposited via complaint boxes in the localities of the project zone.

Receipt and registration of complaints**:** this is ensured by the NEE, which is responsible for receiving all complaints related to the project activities and impacts. Complaints received will be recorded upon receipt and the traceability procedure will be established. They are generally classified into 2 groups: (a) Non-sensitive complaints related to the implementation process, including choices, methods, results achieved; and (b) Sensitive complaints generally concern personal misconduct such as corruption, sexual abuse, discrimination.

The NEE will send a formal acknowledgment (by email or letter) within a maximum of one week. In this, the recipient will be informed of the next steps and if necessary, he/she will be asked to provide clarifications or additional information for a better understanding of the problem.

Complaint handling**:** involves verifying the eligibility of the complaint to the mechanism and ensuring that the complaint is related to the project's activities or commitments. The aim will be to establish the link between the facts denounced and the project's activities and impacts. The eligibility assessment will also determine whether the case should be dealt with under the project-specific grievance mechanism or referred to other mechanisms (whistleblowing, etc.).

In the case of unfounded complaints**,** it is essential to conduct the necessary investigations to preserve the project's reputation. This task is the responsibility of the REE and the NEEs. Unfounded complaints include among others those that lack necessary information or are the result of rumours or malicious persons, which may harm the proper conduct of the project. Public complaints or accusations broadcasted to a wider audience that are considered unfounded complaints, will be addressed at IE and REE and NEEs, and may be followed by a formal statement.

In the case of well-founded complaints, two kind of responses can be applied: (i) direct response and action to resolve the complaint; and (ii) broad and thorough audit, and joint investigations, dialogues, and negotiations could be conducted to reach a substantial resolution. This may involve extending the team to national and local experts.

Following the audit and investigations, a contextually appropriate and formal explanatory response is given to the complainant. It should include the procedures to be followed by the NEE to manage the complaint or propose the appropriate bodies to be contacted for cases that does not fall into their responsibilities.

ENVIRONMENTAL AND SOCIAL RISK MANAGEMENT PLAN AND MEASURES IN LINE WITH THE AF ESP

E&S Management Plan

The tables below present the environmental, climate and social management plans. For each of the potential overall risks described in Section 5, the plans indicate the potential impact, recommend mitigation measures, identify who is responsible for implementation of the mitigation measures, and the budget. The plans have been developed with inputs from a broad range of stakeholders consulted through questionnaires during the project preparation process. The recommended mitigation measures apply mostly to all countries, based on where more information was available. A copy of the ESMPs should be made available to all programme staff, participating institutions and other key stakeholder representatives as well as used in community awareness-raising and training activities.

Table 6: Environmental and Social Risk Management Measures in line with the AF ESP

E&S principles Checklist	Potential impacts	Mitigation Measures	Indicators	Responsible	Cost (USD)
1- Conformity with the law	• The project is in full compliance with the countries policies, standards and laws. With an environmental risk category of "B", the project adheres to ensuring that all safeguards are in place to ensure that the activities of the investment do not exacerbate environmental degradation. .	• The fully identified project activities do not generate risks related to conformity with the law so there are no mitigation measures to plan.			
2- Access and Equity	• Risk of insufficient access of the project by a segment of the population • Elite capture in allocating project benefits • Lack of interest to participate in project activities	• Selection criteria will be developed by considering practicality and feasibility, willingness to apply the project approach, exclusion from other previous development initiatives, potential synergies with other current development initiatives, and the presence of committed youth. • Project beneficiaries will be selected through few phases, including (1) screening of potential beneficiaries during consultation with the rice producer organizations and communities, (2) face-to-face meeting and visit to the farm of the beneficiary in order to assess her/his skills of farming and readiness to accept the project terms. • To ensure the equal participation of refugees, women, youth, elderly and other potentially vulnerable groups, dedicated consultations and working groups with these groups will be organized to provide ample space for the consideration of the specific needs of these stakeholder groups. • Close monitoring of the project beneficiaries to assure equal access of men; women, youth and the most vulnerable. • A grievance redress mechanism would support community members and stakeholders to submit any complaint.	• Nb of selection criteria agreed on • Nb of workshops • Nb of participants to these workshops and gender distribution • Nb of complaints	OSS IER/CRoS-Rice 13 EEs	140,000 USD It is incorporated in the investment cost of the project (*baseline, trainings et workshops*)
3- Marginalized and vulnerable groups	• Lack of land ownership may affect negatively some vulnerable groups	• Marginalized people who do not have land will be given priority for access to other project activities such as PPP. The project will also closely monitor the targeting of all project beneficiaries to ensure equal access of refugees, internal displaced people, women, youth and the most vulnerable. • Explain explicitly, transparently and unambiguous during the launching process the project targeting and scaling up mechanism. This should be translated into the local languages so that everybody will be carried along. • Provide priority to marginalized people who do not have land for access to other project activities such as PPPs	• Nb of KAP conducted • Awareness sessions to explain the project in local languages during each launching workshops • % of refugees/internally displaced people involved on the project • % of PPP beneficiaries without land • Nb of complaints	OSS IER/CRoS-Rice 13 NEEs	42,000 USD It is incorporated in the investment cost of the project (*launch, M&E*)
	• Some project activities could increase inequalities and hamper the livelihoods of project beneficiaries	• KAP will be conducted in each country to collect feedback from the population including marginalized groups • Grievance mechanism			
4- Human rights	• The project activities do not generate risks related to human rights.	• The project activities do not generate risks related to human rights so there are no mitigation measures to plan. • Grievance mechanism			
5- Gender Equality and	• Women's status and representation may limit their meaningful participation in project activities and benefiting it outcomes	• Ensure the presence of women and young people in workshops and trainings.	• % of women and youth participating in workshops and trainings	OSS IER/CRoS-Rice 13 NEEs	20,000 USD It is incorporated

Women's empowerment		• A Gender Assessment Action Plan have been developed to ensure that women are meaningfully engaged in project activities and realize an equitable share of project benefits • Communication and sensitization of the population on the gender issue to ensure gender parity in PPP. • Specific activities and innovative equipment will be developed for easier use by women and youth (engendered tools) • Grievance mechanism.	• % of women beneficiaries of PPP • % of women in the POs • Nb of complaints		in the investment cost of the project (*Baseline, communication plan, PPP and workshops*)
	• The majority of those involved and benefiting from the project's field agricultural activities will be men who are mostly landowners	• Women will be specifically targeted to benefit from PPP. This will enhance their access to finance and enable them to generate income, contributing directly to their financial empowerment.	• % of women beneficiaries' PPP resources	OSS IER/CRoS- Rice 13 NEEs	
6- *Core Labour Rights*	• In rural areas where the presence of the state is not very strong, late or unpaid salaries or remuneration non- compliant with the countries labour legislations and laws may occurs as well as Child labour.	• Check during the field visits and trainings the presence of Child labor; • Communication and awareness raising about Child labor. • Grievance mechanism.	• Nb of checking report • Nb of awareness sessions • Nb of complaints	OSS IER/CRoS- Rice 13 NEEs	3,000 USD It will be part of the training, technical assistance and M&E
7- *Indigenous People*	• The planned activities will not affect the indigenous people	• The project activities do not generate risks that trigger this principle so there are no mitigation measures to plan. • Grievance mechanism			
8- *Involuntary Resettlement*	• The project activities do not conduct to involuntary resettlement	• The project will train communities on their own lands so no mitigation measures for resettlement is planned			
9- *Protection of natural habitats*	• Expanding of farms to wetlands, riverbanks and other vulnerable ecosystems such as mangroves.	• The project will be implemented in existing farming lands and will have no harm on natural habitats • Follow-up of the implementation of all activities related to the protection and management of ecosystems and natural habitats. • Awareness sessions to local populations on good environmental practices and the protection of natural habitats.	• Nb of monitoring reports including specific section on activities related to the protection and management of ecosystems • Nb of awareness sessions on the protection of the ecosystems	OSS IER/CRoS-Rice 13 NEEs	3,000 USD It will be part of the training, technical assistance and M&E
10- *Conservation of biological diversity*	• New agricultural practices may represent a form of disturbance for the flora and can affect the biological diversity. • Minor impacts induced by commercialization of harvesting of rice and its sub-products, organization of demonstration and trainings sessions on the field, etc. • Use of low quality of rice seeds and plants	• The defined interventions (CRRP) will not affect the biological diversity. It is mainly about sustainable agricultural practices • Include training on sustainable land development and preparation methods including zero or minimum tillage • Organize awareness to discourage clearing of virgin forests for cropping and draining of mangroves for rice paddies and vegetable farming. • Establishment of local nurseries to produce high quality and adapted to SRI	• Surface (ha) of areas under CRRP • Nb of meetings and training organized on sustainable land • Nb of training topics on the protection of the ecosystems • Nb of established local nurseries	OSS IER/CRoS-Rice 13 NEEs	3,000 USD It will be part of the training, technical assistance and M&E
11- *Climate change*	• Emission of greenhouse gases: the approach promoted by the project activities do not generate risks related to climate change. The proposed measure will enhance the positive impacts of the project	• The proposed CRRP will have a co-benefit on carbon sequestration with optimal use of water for rice production • Training session on how to use alternate wetting and drying irrigation method to reduce CH4 emission and how to improve nutrient management including the retention of rice residues	• Nb of meetings and training organized on how to drain rice paddies	OSS IER/CRoS- Rice 13 NEEs	

12- Pollution prevention and resource efficiency	• Rice intensification may lead to an accurate use of pesticide and chemical fertilizer	• Awareness session on the danger of the use of chemical fertilizers and pesticides • Promotion of the use of manure, compost and organic pest control remedies	• Nb of awareness sessions on manure, compost and organic pest control remedies • % of project beneficiaries using the manure, compost and organic pest control remedies	OSS IER/CRoS- Rice 13 NEEs	3,000 USD It will be part of the training, technical assistance and M&E
13- Public Health	• Rice cultivation may lead to water- or vector-borne diseases (such as cholera or Malaria) increase, and the proliferation of insects near the water points	• Raise awareness and support mechanisms to prevent and control spread of water related diseases such as Malaria and Bilharzia among the program workers and local communities	• Nb of awareness sessions on diseases • Nb of participants in these sessions and gender distribution	OSS IER/CRoS- Rice 13 NEEs	3,000 USD It will be part of the training, technical assistance and M&E
	• COVID-19 can favour the displacement across borders and abroad. Ebola outbreaks in Guinea constitute a high risk that can hinder the implementation of activities	• Follow the national sanitary regulations and provisions made to cope with other disasters such as Ebola and COVID-19 during the implementation phase.	• Nb of information sheet on the epidemic situation based on WHO publication about its spread • % of compliance with national regulations regarding hygienic measures, permitted behaviour in terms of meetings and travel restrictions		
14- Physical and Cultural Heritage	• The introduction of new rice farming practices may face the resistance may experience from communities and the Chief	• Awareness raising sessions on how the CRRP/SRI as an innovative methodology which will enhance the traditional knowledge and supporting them to increase their incomes	• Nb of sessions organized	OSS IER/CRoS-Rice 13 NEEs	3,000 USD It will be part of the training, technical assistance and M&E
15- Soil and land conservation	• Some activities may lead to soil degradation and clearing of virgin forest or land	• The proposed CRRP (SRI+SLWM) will have a co-benefit on carbon sequestration with sustainable land use • Raise the local population's awareness to strengthen the sustainable management of soil and land • Reduction of water use for irrigation • Composting production will contribute to increase soil quality and fertility	• Surface (ha) of areas under CRRP • Nb of awareness sessions on sustainable management of soil and land • % of water use in the irrigated plots • Nb of composting units created	OSS IER/CRoS-Rice 13 NEEs	3,000 USD It will be part of the training, technical assistance and M&E

Cumulative Impacts of the Project

Potential impacts	Mitigation Measures	Indicators	Responsible	Cost (USD)
• Potential to have negative impacts (concurrent with third-party activities) on the same resources	• Consultations and coordination to ensure that implementation and management have reduced cumulative impacts	• Meetings, • Trainings/workshops	IER/CRoS-RICE 13 NEEs Interested stakeholder	3,000 USD It will be part of M&E

Analysis of Alternatives

The traditional approach to rice farming in the region has been by default organic farming; this has been primarily due to a lack of agrochemical availability. Based on the analysis of the approach thus far, the outcome has been to focus on high-yielding rice. This has environmental implications of increased agrochemical use, the exhaustion of already poor soils and the excessive clearing of natural forest. Based on this analysis the project decided to use climate resilient rice production instead of pursuing maximum yields through high-input intensification.

Under other projects in the region, farmers were encouraged to abandon the destructive shifting agricultural practices. The abandonment of slash-and-burn agriculture will be encouraged through the promotion of climate-resilient rice production. Slash-and-burn agriculture is practiced by the extremely poor farmers and involves the slashing and burning of forestland to grow rice. Cultivation of rice in the mangrove areas is becoming popular because of the inherent fertility of the mangrove swamp. This has severe consequences with loss of mangrove, which can lead to flooding and storm surges. The project will discourage the cultivation of land in the mangrove dominated wetland areas.

ENVIRONMENTAL MONITORING PROGRAM

The ESMP monitoring program presents the indicators to monitor the mitigation and improvement measures. The following actors will undertake this:

Regional Implementing Entity (RIE)

All E&S monitoring activities will be conducted under the supervision of the E&S committee of the implementing entity (OSS), which will send monitoring reports to the Adaptation Fund. In accordance with the ES policy of the Adaptation Fund, project monitoring and evaluation by the implementing entity must take into account all identified environmental and social risks and impacts. OSS will carry out monitoring and evaluation missions and will ensure the proper execution of the project according to the project schedule and that the funds are allocated for activities planned. In the event of a grievance, the Environment and Social Committee of OSS (ESCO) will clarify the situation and find the appropriate solutions to the problems posed. The annual reports to be submitted by OSS to the Adaptation Fund on the project implementation will include a section on the status of implementation of the ESMP and how the E&S risks/impacts are avoided, minimized or mitigated. The reports shall also include a description of the shortcomings and make corrections. The mid-term and final evaluation reports will also include an assessment of the project's performance in relation to E&S risks and grievance management.

Regional Executing Entity (REE)

The REE will be responsible for the supervision of the 13 NEEs activities related to monitoring the ESMP at local level and for submission of the ESMP report to OSS. This report will take into account the management of the 15 principles of the Adaptation Fund. This report should include the grievance management. On a quarterly basis, the REE will gather the reports from the NEEs, who will rely on a bottom-up feedback system with community inputs. In order to ensure a relevant monitoring, regular field visits will be organized i) to inspect and verify the efficiency of the mitigation measures and ii) to check the extent of the foreseen impacts. Given that this is a regional project, the impacts may also be regional and the limited expertise of the NEEs might not be sufficient to monitor these impacts adequately. The REE and the RIE will carry out regular field missions for close monitoring of risks, impacts and mitigation measures, especially those with a regional connotation. In this context, the involvement of all implementing and executing entities is necessary to ensure adequate monitoring of mitigation measures at the local, national and regional levels. The ESMP report should be submitted to OSS on a yearly basis.

National Executing Entities (NEE)

The NEEs will be responsible for coordinating and monitoring environmental and social indicators. The NEE will also be in charge of analysing data, managing local information systems and supervising the baseline establishment at the beginning of the project. The NEE will prepare quarterly reports and submit them to the REE.

Local Communities

The ESIA monitoring will also include a community-based component. In fact, the project plans to carry out training and capacity building sessions for the benefit of local agents and communities, in data collection and monitoring. Communities will be informed about the activity risks and will be involved in the implementation and monitoring of mitigation measures.

Table 7: Roles and Responsibilities of EM Program

Actor Involved	*Responsibility/Role*
Implementing Entity (OSS)	OSS will be committed to adherence to AF standards and ESP principles and will implement mitigation measures as part of the ESMP.
Regional Executing Entity (REE)	Monitor and disseminate the ESIA / ESMP, in particular its grievance mechanism, among relevant stakeholders and beneficiaries. Ensure that the implementation of the project complies with applicable national and standard regulatory frameworks. Monitor the implementation of ESMP activities and evaluate the effectiveness of the mitigation measures put in place.
National Executing Entities (NEE)	Each NEE will ensure the day-to-day implementation of the project and ensure regular monitoring, identifying any new potential risks for society and / or the environment during the project implementation, so that measures of support and appropriate attenuation can be implemented to be adopted on time.
Local Communities/ Project Partners	Provide information on potential new social / environmental risks that may arise during the implementation of the project. Assist in the implementation and monitoring of mitigation measures based on their expertise.

As part of the monitoring of the implementation of the RICOWAS ESMP, it is important to carry out an annual monitoring and evaluation mission of the application of the environmental measures foreseen in the ESMP in order to detect any unforeseen impacts. The reports produced by the national technical structures should be transmitted to the structures involved in the implementation of the ESMP as well as to the FA.

The costing of the measures took into account the most important elements of the environmental management plan. The gender and gender issues will be respected in carrying out the different project activities in accordance with the E&S policy of the FA and the OSS. Moreover, in the case of a problem related to Environmental and Social Management, the population has at its disposal a grievance mechanism relating to the project through which it can express its claims. Given this, the total cost of implementing the ESMP for interventions in the framework of the implementation of the RICOWAS project activities is incorporated in the investment cost of the project.

CAPACITY STRENGTHENING PROGRAM

A successful mainstreaming of climate change and the ESMP into implementation of the project requires the strengthening of institutional capacities, in particular those of REE, NEEs, Farmers Organization and Women Organizations. Moreover, there is a strong need for context-specific, in-situ training sessions for farmers, and others in the value chain, for example on CRRP and SLWM, to improve their resilience to deal more effectively with climate-related weather events. The table below shows the cost of the capacity building program for these actors.

Table 8: Stakeholder capacity strengthening program

Topic	Target entities	Implementing entities	Indicators	Timing	Cost (USD)
Community sensitization in field	Farmers organizations Farmers	14 EE Extension services	Nb of training sessions Nb of trained persons	Throughout the project	No additional budget
Data gathering and use of tools for data analysis	13 NEE Extension services	REE	Nb of training sessions Nb of trained persons	Annually	20 000
Reporting and monitoring implementation of ESMPs	14 EE Extension services	OSS	Nb of training sessions Nb of trained persons	Project start	15 000
Conflict resolution and grievance management mechanisms	14 EE Extension services	OSS	Nb of training sessions Nb of trained persons	Project start	15 000

ANNEXES

Complaint form

This complaint form can be filled out by typing to enter the requested information. When completed, you may print and sign, or you may upload a photo of your signature (instructions provided below) and e-mail the completed form to doleances@oss.org.tn

Complainant information	
Name	
On behalf of	
Phone	
E-mail address	
Do you request that identity be kept confidential? ☐Yes ☐No	
Complaint	
Subject	**…….....** **……...** **……** **……** Project name …… ……... Project location (Country, Village, etc.) …… ……...
Details of the complaint (include nature of the infringement)	
Supporting documents (if any)	
Which results you wish to be achieved (optional)	
Reserved for Social and Environmental Committee	
Registration number	
Received by	**Date**
Nature of the complaint	
Conditions of admissibility	**Admissible ☐ Non-admissible ☐**
Reserved for the specialized commission	
Reasoned opinion	
NOTES	

1. This form is to ensure that the complaint is received, key information is provided and action is initiated for investigation.
2. The "Complainant" may not be a person, the request can be initiated by a letter sent to a newspaper, an article or the Internet.
3. Complaints may be submitted by mail, fax, e-mail, or hand delivery to the OSS.
4. The "Details" must include a brief description and may refer to a letter or any other detailing document. Complaint may include any other information that s/he consider relevant
5. If the supporting documents are provided, it is important that they are registered to be examined during the investigation and to avoid any subsequent complaint alleging a concealment of pieces, even if it is not intentional
6. Under the "expected result", the complainant can specify the expected outcome after filing complaints such as: disciplinary action, cancellation decision etc.
7. It is accepted that the ON maintains a register of all complaints received indicating the results of the survey in the "registration number".
8. The person receiving the complaint must sign and date the form.
9. When an investigation request is made, the person's name assigned to the investigation and the date on which he/she receives the complaint are recorded

Signature: Date:

OBSERVATOIRE DU SAHARA ET DU SAHEL
SAHARA AND SAHEL OBSERVATORY

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Annex 3 Gender Assessment and Action Plan

OVERVIEW OF RICOWAS PROJECT

Project background

West Africa is the rice production basket of Sub-Saharan Africa, producing over two thirds of its rice. Rice is a staple crop grown in West Africa for more than 3500 years with the domestication of African rice (*Oryza glaberrima*). Produced by low-income smallholders across the entire region, rice plays a key role in regional food security for rural and urban populations. In recent years, increasing demand stemming from population growth and steady increase in annual per capita consumption (combined at 5.93 percent per year from 2010-2017; with per capita consumption in 2017 as high as 164 kg in Sierra Leone and 150 kg in Guinea) has outpaced production (4.1 percent per year for the same time period), leading to ever-increasing rice imports from Asia, accounting for 46 percent in 2017. This places a heavy burden on government budgets and exposes the region to the volatility of world market prices. This became apparent in 2008, when world market prices tripled in less than four months, resulting in riots (e.g. Liberia, Senegal) over a staple food that the majority of population could not afford anymore. In response, the Economic Community of West African States (ECOWAS) launched a regional Rice Offensive in 2013 with the goal to achieve rice self-sufficiency by 2025.

The untapped potential to increase rice production is very high, based on currently low yields, under-utilized land and the availability of climate-smart rice production techniques. By using the climate-resilient rice production approach, the Rice Offensive can address critical challenges simultaneously: respond to increasing rice consumption needs, strengthen livelihoods of rice farming communities, allow for diversification of crops as well as other economic activities, improve the national economic well-being, free-up hard currency previously used for rice imports - for other national needs, and contribute to political stability. All in all, this will allow to withstand and adapt to the imminent climate change threads to this key economic sector, and free human, environmental and financial capitals to tackle other pressing adaptation priorities. In addition, it was noted that the yield of rice increased by 33.22 percent over the period 2007-2017 while that of corn increased by only 5 percent over the same period. Other cereals such as millet and sorghum have seen their yield decline over the same period. These figures reflect the importance of rice production in the region.

West Africa has been identified to be particularly vulnerable to climate change due to the combination of naturally high levels of climate variability, high reliance on rainfed agriculture, and limited economic and institutional capacity to cope with climate change.

Given this challenge, OSS, in partnership with IER/CRS-RIZ, is developing a regional response: The project entitled RICOWAS will be implemented in the thirteen ECOWAS countries (Benin, Burkina Faso, Côte d'Ivoire, The Gambia, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo). It will build on existing human and institutional capacity, and the achievements of the regional project "Improving and Scaling up the System of Rice Intensification in West Africa" (SRI-WAAPP), which was commissioned and supervised by the West and Central African Council for Agricultural Research (CORAF).

Project Objectives

The global objective of the project is to improve climate resilience and increase rice system productivity of smallholder rice farmers across West Africa using a climate-resilient rice production approach. More specifically the project will:

- Strengthen the resilience and capacity of smallholder rice farmers and other rice stakeholders in the region to use agro-ecological and sustainable land and water management strategies that respond to the climate change threats in their respective localities;
- Assist farmers to implement and scale-up Climate-Resilient Rice Production (CRRP), and to participate in other economic activities of the rice-value chain;
- Support a communication platform and engage in advocacy to promote efficient exchange of knowledge and expertise among diverse stakeholder groups in West Africa and beyond;
- Facilitate the establishment of a coalition of partners at national and regional levels for the scaling-up of CRRP.

The project will benefit 153,131 rice producers, including 53,814 (37 percent) women in the region. The table below summarizes the data disaggregated by country.

Table 1: Project intervention areas

Country	Regions	Districts	Communes	Total population	Total Direct Beneficiaries (= Rice Producers)	Men	Women	Women	Total Rice area
	Numbers	Numbers	Numbers	Numbers	Numbers	Numbers	Numbers	%	ha
Benin	4	9	23	2,432,899	7,128	3,299	3,829	54	7,061
Burkina Faso	6	17	22	7,748,307	6,830	3,923	2,907	43	2,142
Côte d'Ivoire	25	32	32	1,050,242	3,392	2,869	523	15	3,199
The Gambia	4	6	18	252,501	8,485	1,575	6,910	81	2,122
Ghana	7	16	54	12,800,659	13,173	10,246	2,927	22	10,176
Guinea	4	6	6	540,215	5,600	4,050	1,550	28	2,200
Liberia	6	14	35	1,379,688	13,620	4,602	9,018	66	2,741
Mali	4	10	11	521,016	18,164	15,439	2,725	15	9,403
Niger	4	8	9	571,405	10,981	10,519	462	4	3,241
Nigeria	5	5	15	2,458,044	30,000	20,000	10,000	33	15,000
Senegal	11	23	102	2,073,541	14,245	6,094	8,151	57	6,213
Sierra Leone	4	10	38	1,674,078	15,000	13,585	1,415	9	3,000
Togo	5	17	31	2,234,710	6,513	3,116	3,397	52	4,742
Total	89	173	396	35,737,305	153,131	99,317	53,814	37	71,240

Description of project sites

The project will be implemented in rural zones of the thirteen countries. The process adopted to identify the project zones in each country was for the National Executing Entities (NEE) to propose the zones based on the i) national priorities for rice production, ii) the climate change threats to those zones, and iii) the identified adaptation strategies to be implemented and scaled-up. Based on all this information provided during the concept note stage, the proposed areas were confirmed or refined based on selection criteria such as, vulnerability assessment of population in regard to climate change threats to the national rice sectors.

The consultation workshops have highlighted that women, youth, refugees, internal displaced people and people living with disabilities are the main marginalized and vulnerable groups in the region. These peoples are the unlikely to have access to land and to participate actively to the project. The process of identifying project beneficiaries involves (i) the formulation of selection criteria and priorities and (ii) consultations with rice producer organizations and local authorities as well as potential communities. Selection criteria will consider practicality and feasibility, willingness to apply the project approach, exclusion from other previous development initiatives, potential synergies with other current development initiatives, inclusion of women and the presence of committed youth.

METHODOLOGY

This gender assessment combines an in-depth analysis of gender gaps in agriculture and rural sector policy and institutions, based on thorough document analysis, use of available sex disaggregated data and gender sensitive indicators, and a gender aware participatory policy diagnosis in each of the thirteen countries. The review of documentation included strategies and policies, as well as existing national gender and agriculture data and reports. The assessment was informed by the following key documents: (i) key policy documents of the agricultural and rural sectors in each country; (ii) ECOWAS Gender Policy and Supplementary Act relating to Equality of Rights between women and men for Sustainable Development in the ECOWAS region; (iii) national and international instruments on gender equality or women empowerment.

A questionnaire was filled out by the national facilitator of the National Executing Entity (NEE) to gather accurate information on gender issue in the project areas. The main purpose of the questionnaire was to seek the beneficiaries' points of view and to collect information for a better design of the project with a focus on involving vulnerable groups, including women and youth.

Key informant interviews were conducted with a total of 728 stakeholders in the project zones of all thirteen countries to provide additional information to support the desk review and to improve the quality of the data. The outcomes of the questionnaire and interviews were discussed and validated during national consultation workshops in the thirteen countries.

FINDINGS OF THE GENDER ASSESSMENT

Institutional framework promoting gender aspects in thirteen countries

International protocols and frameworks ratified by countries in support of gender equality, women's empowerment and Human Rights

The following table summarizes the main international and commitments of the thirteen countries

International
UN Declaration on Human Rights (1948)
Protocol II Additional to the Geneva Conventions of 12 August 1949 on the Protection of Victims of non-international Armed Conflict
UN International Covenant on Economic, Social and Cultural Rights (1966)
UN Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) (1979)
UN International Covenant on Civil and Political Rights
Convention on the Rights of the Child (1989)
Vienna Declaration and Program of Action from the Vienna World Conference on Human Rights (1993)
Beijing Declaration and Platform for Action (1995)
UN Security Council Resolution 1325 on Women, Peace and Security (2000)
Convention on the Rights of Persons with Disabilities (2008)
Regional
African Charter on Human and Peoples' Rights (1981)
African Charter on the Rights and Welfare of the Child (1990)
African Union's Protocol to the African Charter on Human and People's Rights on the Rights of Women (Maputo Protocol, 2003)
Solemn Declaration of Gender Equality in Africa (2004)
ECOWAS Agricultural Policy (ECOWAP/CAADP) (2008)
AU Gender Policy (2009)
AU Agenda 2063 (2014)

National frameworks, policies, plans and programs on gender equality

Country	Policies, plans and programs on gender equality
Benin	• Constitution of Benin of 1990: prohibits discrimination based on race, sex and religion, and grant men and women equal economic and social rights as citizens. Article 26 establishes the general principle of equality between men and women, and Article 6 proclaims the equality of Beninese citizens of both sexes. • National Policy for Gender Promotion (2009) Aims to achieve gender parity between the sexes, within the larger context of sustainable development. • Strategic Guidelines for Development (2011). This espouses promotion of gender inequality, women's empowerment, and improved social protection within the larger framework of development.
Burkina Faso	• Constitution of Burkina Faso of 1991: establishes that all individuals are equal, regardless of gender. • Law No. 043/96/ADP of November 1996 on the Prevention and Punishment of FGM. • National Gender Policy (2009). • Gender Quota Act (2009): stipulates that 30 percent of candidates on electoral lists must be women. However, as a result of the 2015 elections, only 11 percent of parliamentarians are women (compared to 19 percent in 2012). • Law No. 034-2009/AN of 16 June 2009 on rural land tenure: establishes that managed land shall be granted to women. • Law No. 034-2012/AN of 02 July 2012 on agrarian and land reorganization.
Côte d'Ivoire	• Constitution of Côte d'Ivoire of 2016, which enshrines the principles of gender parity in the labor market and equal opportunities in employment and elected assemblies in articles 36 and 37. • Law adopted by the parliament on 02nd of August 2019 requiring political parties to present a quota of at least 30 percent women on the lists of candidates for single-member and multi-member elections. • Law No. 2013-33 of 25 January, 2013 on marriage in Côte d'Ivoire as amended by Law No. 2019-570 of 26 June 2019 on marriage. • Law No. 2015-635 of 17 September 2015 on amendment of Law 95-696 of 7 September 1995 on Education.
Gambia	• Women's Bureau and NWC (1980). • National Policy for the Advancement of Gambian Women (NPAGW 1999-2009). • Women's Act (2010). • Gender Mainstreaming and Women Empowerment Strategic Plan (2010). • Gender Empowerment Plan, 2007–2011.
Ghana	• Constitution of Ghana of 1992 (Article 17) – the directive principle of state policy – prohibits discrimination based on gender.

	• Criminal Code Amendment Act 1998 (Act 554) criminalization of female genital mutilation through an amendment. • Domestic Violence Act, 2007, Act 732 to address violence against women. • Intestate Succession Law of 1985, amended in 1991, aimed at providing a uniform intestate law applicable throughout the country, especially when a spouse dies intestate. • Labour Act 2003, Act 651, section 68, which reiterates the right to equal pay for equal work, without distinction of any kind.
Guinea	• Constitution of Guinea of 2010 guarantees all citizens equal rights to political, economic, social and cultural opportunities regardless of gender and prohibits sex-based discrimination. • National policy on women promotion. • Poverty Reduction Strategy Paper 1 and 2. • National Literacy and Non-formal Education Policy.
Liberia	• The National Gender Policy - promote gender equitable, socio-economic development and improve national capacities for enhanced gender mainstreaming in the national development processes. • Liberia's gender-based violence National Action Plan. • The National Forestry Reform Law, 2006.
Mali	• Creation of the Ministry for the Promotion of Women, Children and the Family in 1997 as the main government institution responsible for women's empowerment and gender equality. • National Policy for Gender Equality, adopted in 2010. • Gender and Development Thematic Group" (GT/GED) was established to facilitate dialogue between the government, development agencies and civil society to support the policy's implementation. • Agricultural Orientation Law of 2006 takes a strong approach to gender equity, food sovereignty and support for small-scale farming. • Gender Quota Act (2015): requires that at least 30 percent of elected or appointed officials be women.
Niger	• Constitution of Niger of 2010 guarantees all citizens equal rights regardless of gender and prohibits sex-based discrimination. • National Gender Policy was adopted in 2008, along with a decade-long plan (2009- 2018) for its implementation. • Law n° 2000-008 du 07 June 2000 amended on 2014 requires that 15 percent appointed officials and 25 of elected be women.
Nigeria	• Constitution of Nigeria of 1999 provide the fundamental principle of equality. Section 17 provides that the state social order is founded on the ideals of freedom, equality and justice. Section 15:2 expressly prohibits discrimination on the grounds of origin, sex, religion, status, ethnic or linguistic association or ties. • National Gender Policy. • National Gender Policy in Agriculture 2019.
Senegal	• National Gender Equity and Equality Strategy for the 2005-2015 period (SNEEG 1), which was updated in 2016 (SNEEG 2) to cover the period 2016-2026. • Constitution of Senegal of 2001 under Article 7 guarantees equality between men and women.
Sierra Leone	• Constitution that guarantees equal rights of all Sierra Leoneans irrespective of diversity, gender, age, religion, ethnic group and so on. • The Agenda for Change and Agenda for Prosperity emphasize the importance of reforms and programs to promote gender equality, including through improved access to capital and training for women. • The Decentralization Policy and the Local Government Act (2004). • The National Land Policy has been developed, which makes provision for tenure security and land administration. It proposes eight strategies to promote women's rights to land and property.
Togo	• Constitution of Togo of 1992: prohibits discrimination based on race, sex and religion, and grant men and women equal economic and social rights as citizens (article 2). • Family code 1980 provided women with set of laws for their empowerment. • The Penal Code of 2015 qualifies as economic violence the constraints imposed on women to deprive them of or restrict their financial independence (art. 237). • Law No. 2013-008 of March 22, 2013 on the Electoral Code includes new provisions intended to revise the Electoral Code and promote gender parity in elected positions.

Demographic and socio-economic characteristics

This analysis is conducted for all thirteen countries, identifying human development, education and gender gap index. It has to be considered that women's response and ability to cope with climate change issues depend on the robustness of their underlying health and wellbeing and on the extent of their control over economic resources and access to economic and financial resources.

Table 2: Gender indicator of the thirteen countries (Human development report – 2019)

Countries	Human development	Gender inequality		Gender development index		Expected years of schooling	
	Rank	Value	Rank	Value	Group[35]	Female	Male
Benin	158	0.612	148	0.855	5	11.4	13.8
Burkina Faso	182	0.594	147	0.867	5	9.1	9.4
Côte d'Ivoire	162	0.638	153	0.811	5	9.0	10.9
The Gambia	172	0.612	148	0.846	5	10.0	9.8
Ghana	138	0.538	135	0.911	4	11.4	11.6
Guinea	178	NC	NC	0.817	5	8.0	10.8
Liberia	175	0.650	156	0.890	5	9.2	10.4
Mali	184	0.671	158	0.821	5	6.8	8.1
Niger	189	0.642	154	0.724	5	5.7	7.2
Nigeria	161	NC	NC	0.890	5	9.4	10.6
Senegal	168	0.533	130	0.870	5	8.9	8.2
Sierra Leone	182	0.644	155	0.884	5	9.7	10.6
Togo	167	0.573	145	0.822	5	11.5	13.8

Benin

Benin is one of the poorest countries in the world, ranking 150th out of 175 countries in terms of GDP per capita. The population is estimated at 11.5 million people in 2018. According to the 2016 Human Development Report, Benin ranked 163rd out of 188 countries surveyed on the Gender Equality Index. Around 40 percent of the population lives below the income poverty line (World Bank 2015). Although the country exhibits gender parity in labor force participation (% ages 15 and older): 73 percent of men and 70 percent of women are employed (UNDP, 2015), the latter lag behind on education attainment (% ages 25 and older): 31 percent of men as compared to only 16 percent women have received 'some secondary education; average years of schooling is 13.7 years for men versus 10.5 for women. In the Educational Attainment, sub index of the Global Gender Gap Index (WEF, 2017). Benin is among countries surveyed on the reduction of gender gap in education indicator having closed less than 60 percent of the existing gap. Thus, these different enumerations point towards a trend of women entering the job market on lower technical and educational capacity, which limits them to low-paying and informal jobs, lack of social security, and stable income sources. Among the unemployed, young adults form the bulk: 72 percent of the unemployed are 35 years or younger (World Bank, 2015)

Burkina Faso

The population of Burkina Faso is estimated at 17.9 million people in 2014, of which around 51 percent are women. Nearly half (46.2 percent) of all households are headed by women. According to the 2016 Human Development Report, Burkina Faso ranked 182nd out of 189 countries surveyed on the Gender Equality Index. This situation is the result of inequalities based on perceptions and social practices particularly in rural areas that restrict women's rights and reduce their access to economic and social opportunities in relation to men, such as financial inclusion or political commitment (AfDB, 2019). According to the 2014 Multi-sectoral Continuous Survey, 40 percent of the population lives below the income poverty line. The National Institute of Statistics and Demography (INSD) reveals that poverty is mainly rural in Burkina Faso (more than 92 percent of the poor live in rural areas). Individuals living in households headed by women under 45 years of age and the ones headed by polygamists are generally poorer than others are. The poverty rate for female-headed households is 11 percent higher than for the ones headed by men.

The enrollment rates for boys and girls are almost equal at the primary education level and these changes at the secondary and university levels: in the latter, the average enrollment rate for boys is 35 percent and 32 percent for girls. Literacy rates for children aged 15 to 24 are higher for boys (56.8 percent) than for girls (43.8 percent). Unequal access to education limits women's opportunities in the area of skilled employment while they are highly integrated in the informal

[35] Countries are divided into five groups by absolute deviation from gender parity in HDI values. Group 1 comprises countries with high equality in HDI achievements between women and men (absolute deviation of less than 2.5 percent), group 2 comprises countries with medium to high equality in HDI achievements between women and men (absolute deviation of 2.5–5 percent), group 3 comprises countries with medium equality in HDI achievements between women and men (absolute deviation of 5–7.5 percent), group 4 comprises countries with medium to low equality in HDI achievements between women and men (absolute deviation of 7.5–10 percent) and group 5 comprises countries with low equality in HDI achievements between women and men (absolute deviation from gender parity of more than 10 percent).

sector. Women are responsible for all the production, processing and marketing of their agricultural products. The number of hours of work per week in rural Burkina Faso is 96 hours for women while that of men is 56 hours.

Côte d'Ivoire

Côte d'Ivoire has an estimated population of 25.8 million in 2019 (National Institute of Statistics), 51.7 percent being male and 48.3 percent female, and therefore a sex ratio of 107 men per 100 women. 75.5 percent of the population lives in forest areas and 49.7 percent in rural areas. The population is also relatively young with 36.2 percent being between 15 and 34. In 2016, the fertility rate remains high with an average of 4.6 children per woman, with differences between rural (6.0 children) and urban (3.4 children) areas.

The 2017 report on the implementation of the NDP indicates that Côte d'Ivoire has achieved generally satisfactory macroeconomic performance according to the International Monetary Fund, and that the economy is resilient to endogenous and exogenous shocks. Despite this positive economic performance and the gradual strengthening of its stability, the country remains classified as a low human development country with a ranking of 162nd out of 189 countries and poverty remaining high (46.9 percent, 2015). In addition, the illiteracy rate for people over 15 years of age is 56.1 percent. Proportion of women concerned is 63 percent and that of men 49 percent. As a result, the average length of schooling in 2015 was 4 years for women compared to 6.2 years for men. Education remains key if a country wants to achieve gender equity. According to the World Bank, women's participation in the labor market stood at 64 percent in 2015, mainly in the informal sector.

The Gambia

The population of The Gambia is estimated at 2.35 million in 2019, with an annual growth rate of 2.8 percent (World Bank, 2021) and an average household size of 8.3. About 50 percent of the population lives in rural areas and women constitute 51 percent. One in five households is headed by a female, mainly because of the migration of males to urban areas and overseas. Women's poverty is closely linked to their high illiteracy level (73 percent), the absence of economic opportunities, inadequate access to economic resources, including credit, land ownership, skills and support services. About 67 percent of the population is aged below 25 years (2009 National Youth Policy). In 2018, Gambia's value on the Human Development Index was 0.496, positioning it at 172 out of 189 countries and territories. Gambia had a GII value of 0.620 and thus ranked 150th out of 162 countries. Gambian young women lag behind the young men with an illiteracy rate that hovers around 20-30 percent. According to the Human Development Report 2019, 30.7 percent of adult women have reached at least a secondary level of education compared to 43.6 percent of their male counterparts.

Women account for around 50 percent of the total labor force in the country and 70 percent of unskilled laborers. Around 42 percent of female employment is in agriculture against 22 percent of male employment. 84.6 percent of women are considered in vulnerable employment against 71 percent of males, and only 14 percent as wage - and salary-workers against 29 percent of male. However, The Gambia has achieved important progress with regard to women's education with primary completion rising from 63 percent in 1999 to 73 percent in 2016, higher than 80 percent males in 1999 dropping to 68 percent in 2016 (FAO, National Gender Profile).

Ghana

The total population of Ghana, in 2019 is about 30.42 million, with males comprising 48 percent and the remaining 52 per cent made up of females (World Bank Open Data, 2021). In all localities, the proportion of females is higher than that of males. The estimated number of households in the country is 6.6 million, with a mean household size of 4.0, compared with the 4.4 figure given in the 2010 Population and Housing Census. Household sizes are generally larger in rural areas of Ghana (4.5) than in urban ones (3.6). The proportion of male-headed households (69.5 percent) is higher than that of female-headed ones (30.5 percent).

According to the 2019 Human Development Report, Ghana is in the league of countries with medium human development. The HDI for Ghana was 0.611 and this score ranks Ghana in 138th position out of 189 countries. For the Gender Inequality Index, Ghana ranked at 135th position, implying that the country needs to do more to improve its GII rating. The 2010 National Population and Housing Census (Ghana Statistical Service, 2013) indicates that the proportion of employed males is slightly higher than that of employed females, except in the case of services and sales (31.4 percent for females and 10.2 percent for males), and elementary occupations (7.5 percent for females and 4.3 percent for males). The Ghana Living Standards Survey Six corroborates these findings, revealing that the proportion of females (31.3 percent) engaged in services and sales work is more than three times that of males (9.2 percent).

Guinea

The population is estimated at 12.7 people in 2019 (World Bank). Women, of whom 46 per cent were of reproductive age, accounted for 51.7 per cent of the population. Guinea ranked 178th of 189 countries in the 2019 Human Development Index Statistical Update, with 62 percent of the population living in multidimensional poverty. The consequences of widespread poverty, food insecurity and malnutrition, poor access to basic public services, socio-political instability, persistent gender inequalities, climate shocks and high rates of population growth are widely felt by the country's 11.9 million inhabitants, and social, economic and food instability were exacerbated by the outbreak of Ebola virus disease in 2014/2015. Although the government of Guinea has taken actions to boost gender equality, significant challenges persist. Child marriage is widespread among girls, reducing girls' education and resulting in among the highest rates of early childbearing worldwide.

Unequal access to education limits women's opportunities in the field of skilled employment while they are highly integrated into the informal sector. In addition, labor force survey data indicate that women are overly represented in informal own-account work and the unemployment rate 7.4 (6.3 for men).

Liberia

In 2019, the total population was estimated at 4.94 million and Liberia was estimated to have a population growth of 2.4 percent. Liberia is ranking at 175 out of 189 countries in the human development category for 2019. This is a composite measure reflecting inequality in achievement between women and men in three dimensions: reproductive health, empowerment and the labor market. Women make up 54 percent of the labor force in formal and informal sectors and continue to be challenged by gender inequalities that marginalize them from equal employment across the productive sectors. When employed, they are not given equal remuneration in line with their male counterparts. Survey reports indicate serious gender imbalances in the representation of women in the public sector.

The country's literacy rate, disaggregated by region and gender, shows that men in both rural and urban areas are more educated than women. The literacy rate for women in rural areas is 26 percent, compared with 58 percent men, and 62 percent for women in urban areas, compared with 81 percent men (Demographic and Health Survey, 2013). The literacy rate among adult men and women is 70 percent and 40 percent respectively. The difference is much larger among the older generation, as only 17 percent of women aged 45-59 are literate, compared with 62 percent of men. Unequal access to education between boys and girls is an underlying cause of the high illiteracy rate among women and girls. Cultural barriers, such as preference for educating boys rather than girls, early or forced marriage, as well as sexual and gender-based violence, which can lead to teenage pregnancy, all undermine the education of girls. Work burdens for girls and women, coupled with responsibilities for taking care of the sick, also hinder girls' school attendance rate, and affect the gender gap in secondary school attendance rates in both rural and urban areas.

Mali

The country of Mali is an agro-sylvo-pastoral land with about 19.66 million inhabitants, of which 51 percent are women. The vast majority of the population (80 percent) lives in rural areas where the national electrification rate in 2016 was 19.39 percent (39 percent national, 86 percent in urban areas). Statistics on total energy consumption in the country in 2016 show that women account for 77 percent of all biomass use. Mali's HDI value for 2019 is 0.427, positioning it at 184 out of 189 countries and territories. The 2019 female HDI value is 0.380, significantly lower than the 0.471 for males, resulting in a GDI value of 0.807. In terms of gender inequality, it is one of the most unequal countries in the world: Mali has a GII value of 0.676, ranking 158 out of 162 countries in the 2018 index.

Similar to other countries in the region, women and girls in Mali have less access to education than men and boys. The adult literacy rate for women is 25.7 percent, whereas the rate for men is 46.2 percent. The proportion of adult women who have reached at least a secondary level of education (7.3 percent) is less than half than the percentage for their male counterparts (16.4 percent). While 78.2 percent of school-age boys and 66.1 percent of girls are enrolled in primary schools, only 48.3 percent complete the primary school cycle. In some areas of the country, less than 36 percent of enrolled children are girls, one of the widest gender gaps in the world. Women make up 38.4 percent of the economic active population (EAP) in Mali, and of these, 74 percent are in the agriculture sector. However, these figures are misleading because the definition of EAP includes paid labor, and a study by the African Development Bank found that 77 percent of rural women working in agriculture declared that they have never received any remuneration (AfDB, Profil Genre).

Niger

By 2019, Niger's population was estimated at 23.31 million inhabitants; it is expected to reach 34.5 million in 2030 and more than triple in 2050 to 69 million. Women account for more than half of the population (52.4 percent), and this share has actually increased in the last seven years according to data from the National Statistical Institute. Female headed households made up 16 percent of the households in Niger according to data from the Demographic and Health Survey in 2012. Women's fertility rate is one of the highest in Africa: 7.6 children per woman and can reach nine per woman in regions such as Maradi and Zinder. Niger was ranked 189 out of 189 countries on the 2019 HDI, with a value of 0.354. During the 1990-2017 period, Niger's HDI value went from 0.210 to 0.354, corresponding to an increase of 68.5 percent. As for the GDI, in 2019, the female HDI was 0.317 in Niger while the value for male was 0.391, leading therefore to a GDI value of 0.812. These disparities present a challenge for development, particularly in areas of illiteracy, mortality, morbidity, access to assets, sexual violence and early marriage. Women, especially in rural areas, face higher unemployment levels and carry a heavy burden of work such as collecting water and firewood, agricultural work, preparing meals or caring for children.

Gender inequality is high in Niger: the country ranked 154 out of 160 countries on the gender inequality index in 2019, with a GII value of 0.649. Its ranking on the OECD Development Centre's Social Institutions and Gender Index, which is a cross-country measure of discrimination against women in social institutions (formal and informal laws, social norms, and practices) across 180 countries, is similar: Niger ranks 153rd out of 159 with a SIGI value of 0.4415, which is very high. Niger is on a list of thirteen Sub-Saharan African countries with a high level of gender discrimination based on the SIGI. The literacy rate of women aged 15 years old and higher is very low, particularly in rural areas where it was 11 percent in 2014. Long-standing traditions attach less value to educating girls than boys, as demonstrated by a high propensity of illiterate women compared to men, with respective percentages of 75.5 and 67.8. The gender gaps are also

reflected in inequalities in enrollment and completion of education: the primary Gross Enrollment Rate was 77.8 percent in 2017, with 83.3 percent for boys and 72.1 percent for girls. The percentage for girls had increased over the last four years, from 64.8 percent in 2013 to 72.1 percent in 2017. Similar percentages are found for primary school completion rates: 83.3 percent for boys and 72.1 percent for girls; the national average is 80.3 percent. Around 67.5 percent of women participate in the labor market, compared to 90.7 percent of men. On average active women are employed for fewer hours compared to men (28 for women and 43 for men) and receive lower wages.

Nigeria

The population of Nigeria was estimated to be 201 million people in 2019, with a population growth rate of 2.6 percent. Women account for 48.8 percent of the population. The ratio between the urban and rural population is 48.3 percent to 51.7 percent. The issue of internally displaced persons has become a major problem in Nigeria's northeast region due to in urgency by the Boko Haram Sects. Within this scenario, data shows that women are over-represented among the Internal Displaces People (IDP).

According to UNDP (2016), Nigeria's HDI value for 2019 was 0.539, which places the country in the low human development category, positioning it at 161 out of 189 countries and territories. Nigeria has high and rising levels of inequality. UNDP reported in 2019 that the proportion of people living below the national poverty line rose from 65.5 percent in 1996 to 69.0 percent in 2010 and then has fallen to 46 percent in 2015. Poverty is higher in rural areas (73.2 percent) than in urban areas (61.8 percent).

Nigeria ranks 18 out of 52 Africa countries in the Gender Empowerment Index, with a mean score of 66.2 in the overall economic opportunities index. This indicates that women can explore obtainable resources at their disposal to register a business, sign contracts and open a bank account in the same way as men. The Department for International Development (DFID, 2012) reported that Nigeria's 80.2 million girls and women have significantly worse life chances than men, or their counterparts in comparable societies. Some 54 million Nigerian women live and work in rural areas, where they constitute 60 to 70 percent of the rural workforce.

According to UNDP (2015), more than 1.5 million (8.1 percent) Nigerian children aged 6 to 14 are currently not in school, a situation that has earned Nigeria a ranking as the world's largest out-of-school children country. More than one-third (38 percent) of Nigerian women and 21 percent of men aged 15 to 49 have no education. Only 17 percent of women and men have attended primary school. More than one-third (36 percent) of women and nearly half of men have attended secondary school. Less than 10 percent of women and 14 percent of men have attended tertiary education. Nigeria ranks 32nd out of 52 African countries in terms of equality in the human development education subcategory. Women represented 42 percent of the total labor force. The employment ratio of men and women in urban areas is 42.37 percent, while the employment ratio of men to women in rural areas is 63.58 percent. The main employment sector is wage labor, household enterprise activities or farming (National Bureau of Statistics 2013).

Senegal

Senegal has a population of about 16.3 million, of which 51 percent is female. More than half of households live in rural areas. The heads of households are mostly men; women head only 15 percent of households. Children, women and the elderly are the most vulnerable to climate shocks and to their harmful consequences. Although Senegal enjoys relative political stability, it faces several development challenges. The country's HDI value for 2019 is 0.512, which places it in the low human development category and 168th position out of 189 countries. Between 1990 and 2019, Senegal's HDI value increased from 0.377 to 0.512, an increase of 36.5 percent. In 2018, the country had a Gender Inequality Index score of 0.523, slightly above the average for sub-Saharan Africa. It ranked 130th out of 160 countries.

The percentages of women with some secondary education and employed women are below the regional average. Literacy rates are 66 percent for men and 40 percent for women. In urban areas laws protecting women are generally respected, but in rural areas, traditional and religious practices such as early and forced marriage prevail, leading to girls dropping out of school, reduced economic productivity and continued gender inequality, which contribute to widening the hunger gap (WFP, Senegal country strategic plan 2019-2023). The share of female labor force in total labor force has been increasing over the past two decades at a faster pace in Senegal than in the rest of sub-Saharan Africa. The growth was particularly notable between 2006 to 2011, when women's share in the total labor force participation rate jumped from 35 percent to 38 percent, and the female-to-male employment increased by 14 percentage points.

Sierra Leone

The World Population recorded Sierra Leone's population as 7.81 million in 2019. From 2004 to 2015 the population has increased from 4,98 million to 7,09 million, representing an average annual growth rate between 2004 and 2015 of 3.2 percent, compared to 1.8 percent from 1985 to 2004 and 2.3 percent from 1974 to 1985 (SPHC, 2015). The country HDI value for 2019 was 0.452—in the low human development category—positioning the country at 182 out of 189 countries and territories (UNDP, 2019). Between 1980 and 2019, Sierra Leone's HDI value increased from 0.255 to 0.420, an increase of 59.4 percent or an average annual increase of about 2.4 percent. The GII for Sierra Leone reflects gender-based inequalities in three dimensions – reproductive health, empowerment, and economic activity. The GDI for the country is 0.871 (UNDP, 2019), in the low human development category.

Girls' access to education is improving in Sierra Leone. The country has made great strides in addressing the traditional practice of boy to girl preference to education. There is almost parity in the number of boys and girls enrolled in primary

school, but retention and completion of education remains a challenge with high drop-out rates for girls and low enrollment in secondary school.12 The statistics reveal that the literacy rate amongst the youth is 59.3 percent for females and 75.8 percent for male. The gross enrollment for in primary is 100 percent, 36 percent in senior secondary school and 8 percent in tertiary (UNDP, 2016). Rural poor predominantly work in the informal sector, evident in the fact that informal employment remains important, persistent and on the rise. There are evident challenges to informal employment. 'Agriculture – including forestry and fishing, crop farming, and animal production – is the largest economic sector, employing 59.2 percent of the employed population' (SPHC, 2015). The quality of work for poor people in this sector needs to be improved, through vocational training and education, micro-and small-enterprise development and access to credit. Working conditions must be improved and the poor needs to be guaranteed social security coverage. Women represent 49.2 percent of the total labor force as most of them are engaged in the agriculture sector.

Togo

Togo's population is estimated at 8.08 million in 2019, of which 51 percent is female. With nearly 60 percent of its populace under the age of 25 years and a high annual growth rate attributed largely to high fertility, Togo's population is likely to continue to expand for the foreseeable future. Reducing fertility, boosting job creation, and improving education will be essential to reducing the country's high poverty rate. The heads of households are mostly men; women head only 15 percent of households. Children, women and the elderly are the most vulnerable to climate shocks and to their harmful consequences. The 2020 Human Development Report presents the 2019 HDI (values and ranks) for 189 countries and UN-recognized territories, along with the IHDI for 152 countries, the GDI for 167 countries, the GII for 162 countries, and the MPI for 107 countries.

In 2008, Togo eliminated primary school enrollment fees, leading to higher enrollment but increased pressure on limited classroom space, teachers, and materials. Togo has a good chance of achieving universal primary education, but educational quality, the underrepresentation of girls, and the low rate of enrollment in secondary and tertiary schools remain concerns. According to the 2014 Demographic and Health Survey, men have a higher level of education than women. Indeed, 32 percent of women aged 15-49 have no education level compared to 11 percent of men in the same group of ages. It should be noted that the proportion of women (47 percent) who cannot read at all is significantly higher than that men (19 percent)

GENDER VIS-A-VIS PROJECT ACTIVITIES

Country analysis

Benin

Gender and rural agricultural labor: Agriculture and commerce alone mobilize more than 2/3 of the workforce, regardless of gender. Indeed, 37.5 and 36.4 percent of employed women work in agriculture and commerce respectively. About 41 percent of women aged 15 to 34 work mainly in agriculture. Important differences exist by region and the proportion of women is higher in the hills where more than 50 percent of women live mainly from agriculture.

Gender and land: In Benin, women often lack decision-making power over what they produce or plant, and commercialization of their traditional products can lead to loss of access and takeover by men, rather than empowerment. As a general trend, their earnings are often reserved primarily for household expenditure – leading to lack of accumulation for any entrepreneurial or economic activity.

Gender and agricultural value chains: At the production level, the complementarity between the actors of both sexes no longer needs to be demonstrated. The different rice production systems (irrigated and non-irrigated) make more intensive use of family labor. The statistics available on a total workforce of 7,081 producers distributed among 296 groups show 3,927 women against 3,154 men, i.e. a percentage of 55 percent of women. The female contribution to the family labor force requested in the production link is estimated at around 70 percent of the total labor force self-supplied by households. Unfortunately, it is only in the southern and slightly central region that this workforce is better paid. In the field of processing (parboiling and milling), the rice processors are mostly women in the rice production villages (or sub-prefectures). They are helped in their task by millers. The role of transformation is very important in the local rice sub-sector because it is these actors who put the rice in its marketable form.

Gender and rice production in the project zones: The rice sector has a strong involvement of men and women as well as young people. In the absence of reliable statistics, the presence of women in the rice sector is very pronounced. They are equally active in production, processing and marketing. In the central and northern regions, women play an important role in parboiling, processing and marketing of rice. In the south, they are involved in sorting milled rice in mini rice mills. At the level of the marketing link, they are in the majority both in the collection and sale of paddy and in the marketing of the finished product. A visit to the various markets of the rice production areas clearly demonstrates the dominance of women in this link. The rice-growing activity is therefore an activity where women are present at the level of the various links. It is important to underline that at the level of the production link; women often benefit from low soil fertility plots.

Burkina Faso

Gender and rural agricultural labor: The agro-forestry-pastoral sector employs nearly 90 percent of the population and accounts for 33.7 percent of GDP in 2016 (ADB, OECD, UNDP, 2017). Women account for 52 percent of household farm workers and work several hours on family land before attending to their own fields, whose crops are for home consumption or sale. The General Agricultural Census indicates that small ruminant breeding is practiced by 42.2 percent of women. As for fishing activities, women are present in the processing and marketing of fish (AfDB, 2019).

Gender and land: Access to land ownership remains a challenge for women in Burkina Faso. Even though they represent over half of the agricultural labor force, they account for less than 40 percent of landowners. When they are landowners, their decision-making power remains limited. Only 14 percent of female landowners have a say in the sale of their land, compared to 32 percent of men, because of customary law and community land management practices. Female-headed households have less access to more advanced agricultural equipment: 96 percent of such household use traditional tools (hoes and dabas, among others), while 21.5 percent of male-headed households in a comparable situation use ploughs.
Gender and agricultural value chains: From production to processing to disposal, gendered patterns of behavior condition men's and women's jobs and tasks, the distribution of resources and benefits derived from income generating activities in the chain, and the efficiency and competitiveness of value chains in the global market. i) Households and Markets Interact in Ways that Affect Access to Land, Labor, and other Assets; ii) Social Institutions Reflect Social Norms, leading to a Gender-differentiated Labor Force; and iii) Legal Frameworks Embody Social Beliefs, e.g., inheritance laws and property rights that restrict people's ability to access and accumulate wealth according to gender categories.
Gender and rice production in the project zones: Rice is almost exclusively produced by women. But men are the bulk of the landowners. The girls have a tiny part in rice production because they participate in activities on a temporary basis (they use their free time to carry out activities such as transplanting, weeding, drying and winnowing). Married women participate more in rice production activities because it is they who accompany the men throughout the campaign. Their activities are cooking, transplanting, weeding, transporting piles of rice after harvest, drying, winnowing). Widows participate daily in rice production activities from start to finish as they are the ones who inherit the land to care for the children after the death of their husbands. Without support, these women find it difficult to access agricultural inputs.

Côte d'Ivoire

Gender and rural agricultural labor: In agriculture, women and men have different contributions to adapt on speculation and socio-cultural contexts. In general, people are involved in export crops and high value-added perennial crops. Women, on the other hand, are involved in both perennial and food crops. At the level of agricultural operations, men are in charge of all operations related to tree felling and land preparation, while women are more involved in self-employment, seeding, weeding and other field maintenance. Women agricultural producers are sometimes found individually or in cooperatives. There are many women's organizations; up to 254 with more than 13,000 members in some regions (ANADER, 2017). In agriculture, 90 percent of the working population is made up of women. According to the World Bank, women's participation in the labor market stood at 64 percent in 2015, mainly in the informal sector.
Gender and land: Access to land is based mainly on customary rules rather than positive law. These customary rules are not generally to the advantage of women. Indeed, traditionally, women in most customs have only indirect access to land. They generally benefit from land acquired through the intermediary of a third party (usually a man: husband, lineage chief, other relative with the consent of the spouse, etc.) for their production, but have no control over resources. They are allocated degraded and remote land, which still has an influence on the working time already spent on household. In the project area, it was noted that for the creation of their own plantations, customary practices exclude them from inheritance tax in the majority of the potential regions of the project.

Given the importance of women in agricultural work, it is necessary to improve their access to land and productive capital as well as their agricultural income to address some of the gender issues. This requires strengthening women's productivity to make them a powerful leader. In addition, ensuring secure land rights for women and men, promoting sustainable land management and alleviating poverty is necessary.
Gender and agricultural value chains: In Côte d'Ivoire, women play a central role in the supply chains, especially in crop production, food crops and market gardening. Food production in Côte d'Ivoire represents about 70 percent of agricultural added value. At the production level, the workforce is generally "family-based", with a workload shared between men, women and children. The woman's work consists of sowing, weeding, harvesting, transporting, storing, managing the attic and processing. Men contribute to the plot preparation work (weeding, cleaning, etc.), which can have a greater impact on deforestation and forest degradation, and also contribute to the uprooting of tubers at harvest time. On the commercial side, women are more represented than men. Despite this, they perceive fewer financial resources from their efforts than men. The marketing of agricultural products (cassava, vegetables) is still informal. Women's productions are fragmented, and their associations and cooperatives are not strong enough to organize the marketing of their members' productions and influence prices and marketing methods. In addition, difficulties in accessing credit and poor financial education are exacerbating these marketing problems. Associations and cooperatives are not financially capable of buying their members' production for cash and then marketing it.
Gender and rice production in the project zones: Women are strongly present in the rice sector both at the production level and at the local rice retail level. They are traditionally present in post-harvest operations (threshing, winnowing) and they practically have a monopoly on the retail trade of local rice in the markets in most of the production areas. Thanks to the organization of school canteens, we have 1,200 women's groups for rice production and supplying 5,230 school canteens across the country. However, several shortcomings were noted in the activities of these women in the sector, particularly at the organizational level (organized in small informal groups).

The Gambia

Gender and rural agricultural labor: Males and females are very differently employed and their contribution to various sectors have changed a lot. In 1998, 57.4 percent of female employment was in agriculture compared to 37.5 percent of male employment. In 2017, such contribution has decreased to 42.4 percent of female employment and 21.7 percent of male employment. Strict divisions of labor also apply traditionally to animal husbandry and fisheries. As is the case in large parts of Africa, women are in charge of small ruminants and chicken while men deal with cattle for reasons of

prestige. This gender division is slowly breaking down with women moving into groundnut production and men being engaged in growing improved rice, with the introduction of NERICA rice varieties to a point of dominance in upland farming systems. The majority of women farmers are unskilled agrarian wage earners and are responsible for about 40 percent of the total agricultural production in the country. Their massive contribution does not translate to the desired improved social status for women. Their productive activities are mainly subsistence-based and for home consumption. Women are also active in horticultural production that generates relatively good income. However, income gained from such activities is often ploughed back into maintenance of the household. Their limited capacity and skills to embark on viable agro-based and entrepreneurial activities, lack of ownership and control over resources such as land and modern agricultural equipment, coupled with the triple roles of women, impede all efforts for rural women to graduate into the mainstream livelihood economy.

Gender and land: In the Gambia, in general, there is still a gap on land ownership between men and women. In total, 30.7 percent of men own land against 20.7 percent of women. Women own land mostly jointly with someone (15.4 percent) and only 4.4 percent own it alone against 15 percent of men. Most farmers in The Gambia are small holders. On average, the farm size is 1.3 ha. This can be a critical barrier for technology adoption. The small size of the farm also illustrates the subsistent nature of agriculture in The Gambia. As expected, the average agricultural land is smaller for female headed households (0.8 ha) compared to male headed households (1.4 ha) (Gambia 2015 IHS). The system of land ownership in the rural areas is traditional land tenure system. This allows men to own a greater proportion of the land currently being used for agricultural purposes. As a result, in many communities, women farmers can access land but not control or own the land. The inequalities created by the traditional land tenure system among men and women in terms of control and ownership disadvantage women farmers from accessing credit to acquire necessary agricultural inputs such as fertilizers, pesticides/insecticides, and quality seed. Since women farmers only have yearly user rights on the land as a result they can only grow (perennial crops) thus depriving them of the possibility for engaging in agro-forestry.

Gender and agricultural value chains: Until recently, the value addition sub sector in The Gambia has been underdeveloped. However, recently, with the support from some donor agencies, a few products are being processed for value addition. In addition, the food-processing sector is gradually growing particularly among the urban women agro-processors who are mainly engaged in processing cereals, fruits and forest products for retail sales. The Food Technology Services Unit, which is the technical arm of the Directorate of Agriculture, is also engaged in capacitating both rural and urban processors (mainly women) with the required skills in food processing and preservation with a view to enhancing their capabilities in value addition for food and nutrition security in The Gambia. The Government's ambition is to transform the agricultural sector, with individual households and communities moving from subsistence to farming as a business.

Gender and rice production in the project zones: Traditionally gender division in agricultural production has been the modus operandi. Men are generally engaged in upland mechanized cropping, usually groundnut, maize and millet while women are mainly engaged in rice cultivation using intensive labor methods. However, this gender division is slowly breaking down with women being engaged in groundnut production and men being engaged in rice production with the introduction of NERICA rice varieties to a point of dominance in upland rice production. Rice is a labor-intensive crop the cultivation of which under difficult lowland conditions continued to be dominated by women. They are the most active in rice production, but both can access land for rice production and all rice growing zones are commonly considered women's' areas. Men usually assist in clearing virgin lands for women and or delisting irrigation canals before start of the season, women are disadvantaged in accessing productive resources such as (land, farm inputs, fertilizers, seeds, access to credit and agricultural extension technical support), compared to male farmers.

Ghana

Gender and rural agricultural labor: Agriculture is the main source of employment for both rural women and men, though rural women are also extensively employed in the wholesale retail, marketing, tourism and manufacturing sectors. Agriculture employs 45 percent of the labor force, albeit with weak linkages between agriculture and industry. It is committed to ensuring gender equity in access to productive resources, such as labor. According to FAO (2012), the overall labor force (both agriculture and non-agriculture) participation rate in Ghana is 71 percent, and it is higher in rural than in urban areas, for both men and women. Rural women enter employment between the ages of 25 and 34, while men enter earlier, aged between 15 and 24. In rural areas, the delay of women entering the labor force does not appear to be due to higher engagement in education or training. Rather, it may be a result of higher involvement in domestic activities. Young men may be joining the labor force earlier due to greater access to land and other productive resources. Education, access to assets and cultural bias may be some determinant factors of this phenomenon, which has implications in terms of future employment. Despite the increased participation of women in rural agricultural labor markets, they are disadvantaged compared with their male counterparts. Women constitute a significant proportion of family workers. They are less likely to engage in wage employment than men, and when they do, they are more likely to hold part-time, seasonal and/or low-paid jobs in the informal economy.

Gender and land: In Ghana, men and women do not have equal access to land, even where legislation has removed gender barriers to land ownership. In most situations, women's access to land and other property generally occurs through a male relative in local areas. In common with the gender division of labor, the gender division of private property is regarded as natural, and therefore not to be questioned. Women's effective exclusion from the possession and control of land is largely the basis of their subordination and dependence on men in Ghanaian local communities. The gender and agriculture baseline report of 2014 revealed that access, control and ownership of land is highly inequitable in its distribution, with women at a disadvantage. The gender gap in land has implications for the food security and income generation prospects of female farmers. It is therefore important that concrete decision to be taken to eliminate or

substantially reduce gender gaps, such as patriarchal practices and other barriers faced by women, especially on land issues. Interaction with key stakeholders in the agriculture sector confirmed that land ownership and tenure security among female farmers is a challenge.

Gender and agricultural value chains: The actors along and within agricultural value chains are men, women, youth and PLWD. Competitive and viable agricultural commodity value chains are therefore key for promoting equity in agriculture and the rural sector. This is because men and women play different gender roles across agricultural commodity value chains, with differing levels of benefits due to the uncompetitive nature of current agricultural commodity value chains in Ghana. Many women are operating in the weak segments of the chain, which are characterized by low returns on their investments. The key gender issue affecting the overall performance of agricultural commodity value chains in Ghana is unequal access for women to productive resources, such as land and credit. In most farming communities, women do not own land and are mostly given marginal lands by their male counterparts. Since they are unable to access credit to invest in the purchase of inputs, they inevitably produce poor yields. Linked to this is the fact that men generally dominate the production segments of agricultural commodity value chains, with women operating in the marketing segments, where they appear to have a competitive advantage.

Gender and rice production in the project zones: Although men dominate rice production in all the ecologies, at specific locations in Ghana, women dominate. Married women mostly join their husbands who are mostly owners of the land to farm. In the processing and marketing sectors, women are the major actors at the small to medium scale levels. Within the marketing chain, the main categories recognized are importers wholesalers, retailers and consumers. Generally, three categories of marketers are recognized:

- Wholesalers: These are rice traders operating in large shops, selling mostly in large quantities of 25 or 50 kg bags. They operate in the big cities and function as intermediaries between importers and retailers.
- Retailers: Retailers procure rice from wholesalers and sell to consumers. They sell rice in bags of various sizes, as well as in bowls and tins.
- Itinerant Rice Traders: These traders buy mainly paddy or milled rice from rice producing communities. The paddy is assembled and milled at central points for sale to local traders or retailers. On a relatively small scale, farmers mill their paddy and sell to traders or local retailers.

Guinea

Gender and rural agricultural labor: Women represent 67 percent of the economically active population nationally, but they continue to face significant challenges in access to and control over productive resources and land, and bear a high burden of responsibility for agricultural, unpaid household and informal work. Women lack access to livelihood options and financial and health services, and their participation in decision-making at the household, community and national levels is limited. Guinea has the second highest prevalence of female genital mutilation in the world, with more than 97 percent of girls and women aged 15 to 49 years having undergone the procedure. More than 50 percent of women are married before the age of 18.

Gender and land: Conflict over rights to land and natural resources is common, particularly in areas where herders compete with sedentary farmers, where mining operations are established, and where refugees fleeing violence in neighboring countries have relocated. Some portions of the population, including displaced people, refugees, and migrants to urban areas, have limited access to land. Women and former slaves are rarely landowners; they depend on use-rights received through relationships with male relatives and former — masters. Agriculture is dominated by subsistence-level farming. Many of Guinea's formal land laws and policies recognize customary land rights but lack implementation. Under the Land Code, rights must be registered, but state land administration institutions lack capacity and resources to support registration. The Rural Land Policy calls for formalization of customary rights but lacks implementing regulations and programs. Most of Guinea's land is unregistered and governed by customary law: rights to this land are vulnerable to transfer by the state or privatization. Women are responsible for nearly 80 percent of the country's food production, but only a small percentage of women own land in Guinea. Instead, women obtain use-rights to agricultural land through their husbands and sons, and they are usually dependent on those relationships to maintain their rights of access to land.

Gender and agricultural value chains: In Guinea, women are more likely to be the decision makers for sales and transformation, while men primarily control the revenue from these sales.

Gender and rice production in the project zones: At the production level, women play a large role in soil preparation, sowing, weeding and harvesting activities. In forest regions, the male / female parity is more marked in soil preparation. In Maritime Guinea, women are responsible for transplanting and weeding in rice cultivation mangrove. In Upper Guinea, where horse-drawn rice cultivation is developed, women are often called upon for weeding. In addition to the family field, women and their organization can get involved in their own farm. In processing and marketing, women rank first. Thus, they are collectors/steamers. These women drain most of the products marketed by producers and steam them before shelling. The rice obtained, of good behavior, allows a husking yield of more than 70 percent and benefits from a quality premium on the markets.

Liberia

Gender and rural agricultural labor: Women constitute the majority of smallholder producers and the agricultural labor force in general. According to the country's 2008 PRS, women produce some 60 percent of agricultural products, carry out 80 percent of trading activities in rural areas and play a vital role in linking rural and urban markets through their

informal networks. Women's participation in key areas of agriculture, mainly cash crop production and natural resources is constrained by a rigid gender division of labor. Men usually dominate cash crop production, mainly through commercial farming. In the production of food crops, women are responsible for planting, weeding and harvesting, while men are in charge of brushing, felling, clearing and fencing. At the start of the agricultural cycle, men usually carry out clearing and felling of land in groups, through communal arrangements (World Bank, 2012). The inability of female-headed households to contribute to communal labor inhibits them from using the land, as this is generally the reason given by community leaders for not granting women access to land.

Gender and land: Liberia had weak and unclear property rights, due to the history of land rights in the country. Customary land ownership rights were not recognized or were treated as less important than private deeded land. Land ownership has alternated between communities and the state, and less than 20 percent of the country's total land is privately titled and registered. A number of efforts have been made by GoL to address the situation. Commercial contract enforcement has proved a challenge for the Government. In 2011, the Government established a separate Commercial Court to help clear the backlog of cases and improve contract enforcement. In spite of these initial efforts, Liberia is ranked number 176 out of 183 countries, in terms of ease and cost of registering property. Rural communities engaged in agricultural practices mostly work on community land that is protected by customary land rights. The land rights policy stipulates that "the customary land rights of groups, families, and individuals within the community will be decided by the community in a way that is fully representative and accountable to all community members, including women, youth, and minorities". The prevailing situation, in which either communities or the state controls land, very little consideration is given to women. In patriarchal societies and communities, men are involved in the decision-making structures regarding community and/ or state land. Although the policy states that women should be part of management committees, they are mainly given less important roles and do not make direct decisions on land issues. The system is still open to exploitation by men, who believe that women should not be accorded the same rights as themselves to own or access land. Rural women are still faced with challenges linked to land inheritance, ownership and access, as well as to resources on land, such as water, which are crucial for agriculture.

Gender and agricultural value chains: Marketing channels are poor in rural Liberia, and limited to surrounding villages or neighborhoods, due to the inadequate infrastructure discussed earlier. In value chains, women and men have different responsibilities in the different stages of production. The division of labor implies that there is gender specific knowledge along value chains. In addition, there is often conflict between men and women over rights to access and ability to control productive resources – land, inputs and information.

Gender and rice production in the project zones: As in most African countries, there is a clear division of labor between men and women in agriculture in Liberia. According to the Comprehensive Food Security and Nutrition Survey, it is estimated that women supply almost 43 percent of the labor for food crops production. Whereas men represent 35 percent of general agriculture labor force. However, in rice, women contribute 36 percent of the total labor While women do most of the weeding and harvesting of rice crop, the men provide most of the labor for clearing and preparing the land. According to the CAAS-Lib Cross-Cutting Issues report (2007), 50 percent of rural women in Liberia are actively engaged in agro-processing, compared to only 25 percent of rural men. In addition to agro-processing, women are clearly the dominant actors in marketing and trading of agricultural produce in the country, comprising 80 percent of all actors in this area and accounting for the majority of micro creditors in rural and urban areas.

Mali

Gender and rural agricultural labor: Malian women play a major role in agricultural production and are responsible for subsistence farming, while men participate in both subsistence and commercial agriculture. In terms of the provision of labor, women and men work side-by-side in almost all the agricultural tasks on the land, while men are responsible for marketing the agricultural products. Men (either fathers or husbands) mediate and control Malian women's access to resources and their contribution to agriculture goes largely unrecognized. Even women who have access to assets rarely have control over them.

Gender and land: Women, 78 percent of whom live in rural areas, are at a disadvantage regarding access to land, financial services, training and markets. They account for 70 percent of food production but hold only 10 percent of land use rights and 8 percent of land ownership titles. Women are also heavily involved in unpaid household work. According to the Ministry of Women, women's access to agricultural sector credit stood at 12 percent of total credit allocated. A major determinant of gender disparity is lack of access to land. The government owns most of the land and in the traditional system of land use; men are more likely to have access to land than women. Traditionally, women cannot own land in Mali. They can cultivate or use land temporarily, but land can be taken back from them at any time. This discourages women from investing in land improvements. Women often form associations and request that community land or land owned by a specific owner be allocated to them for their collective use.

Gender and agricultural value chains: Trade is a significant activity for both men and women. In the marketing of the four most important cereal value chains in Mali (millet, sorghum, rice and maize), women are less involved. This situation can be explained by the fact that they are not major producers of cereals due to their poor access to factors of production. Women are rather heavily involved in the marketing of agri-food products. The marketing of cereals involves several stakeholders. Farmers, collectors, wholesalers, semi-wholesalers and retailers, carry out marketing functions with other agents providing various services such as transport and storage. The grain marketing structure involves a large number of collectors from the growing areas, themselves linked to the wholesalers who are in fact the engine of the system because they buy large quantities of grain cereals and supply the markets. Wholesalers do not buy directly from growers, with the exception of very large producers who can supply them directly. Stakeholders in the value chain, made up mostly

of women, are now organized into cooperatives and federations with a view to improving the organization of processing and marketing of shea products. Income from the sale of shea represents up to 90 percent of the cash income of women in its production areas. The shea value chain benefits from a relatively high rural growth multiplier effect as it is often sold for cash in weekly markets to earn money that will be used to purchase the ingredients needed to make the sauces served with meals cereals, medicines, school supplies (including school fees).

Gender and rice production in the project zones: The state ensures fair access to agricultural land resources for the different categories of farmers and agricultural promoters. However, preferences are granted to women, young people and groups declared vulnerable in the allocation of plots in areas developed with public funds. In general, 10 to 20 percent of developed land is reserved for women and young people. The criteria for the allocation of plots of a group of populations are set by regulation.

Niger

Gender and rural agricultural labor: Women make up more than 70 percent of the Niger's workforce in the agricultural sector. Gender inequalities affect productivity levels: Backiny-Yetna and McGee (2015) found that plots managed by women in Niger produce 19 percent less per hectare than plots managed by men. The main determinants contributing to gender productivity gap in Niger are (i) access to farm labor; (ii) the quantity and quality of inputs; and (iii) land ownership and characteristics, with men owning more land and enjoying higher returns to ownership than women. Women's relatively lower participation in leadership outside the household, as measured by group membership and public speaking, is also considered as a key element that affects their agricultural productivity. Their low productivity levels are also likely to affect their resilience. A study on resilience in Niger found that female-headed households are less resilient than male-headed households. Furthermore, approximately one out of three women (36.2 percent) owns land compared to more than half of men (55.3 percent). Due to inequalities in access to productive resources, such as land and financing, female-headed households have been found to be poorer and more vulnerable to food and nutrition security.

Gender and land: Inheritance of agricultural land in Niger is subject to three categories of law: Islamic, modern and customary law. Not all categories consider women equally. Islamic law recognizes that women may inherit land but gives one share of land to female heirs against two shares to male heirs. As a consequence, only 3,041 ha (4 percent) out of the 73,345 ha of irrigated land identified in Niger in 2004 are operated by women. In Niger, women, especially widows, are the main victims of agricultural related property grabbing including land, farm implements and inputs, discriminatory attitudes and practices that favor male-dominated land tenure system and reinforce existing gender disparities (UN Women, 2018).

Gender and agricultural value chains: Overall, women are less integrated in value chains than men. Their lack of mobility and therefore access to markets, to which are added the standards imposed by society, their limited level of education, their lack of working capital are all obstacles to their interaction with actors in the supply value chain. They are often excluded from horizontal links (relations within the same stage of the chain, for example, with an organization, a group of producers, a support group, etc.) as well as vertical links (relations with actors of the stages located upstream and downstream of the chain, such as buyers, suppliers, etc.) (GIZ, 2014). In the value chain circuit, women are more involved in the low-value link, particularly collection, primary processing, simple employees, while men are predominant in high-value-added activities such as installation and the use of equipment, management positions, wholesale buyers of agro-sylvo-pastoral products. Women suffer from real inequality due to social norms, their lack of training and literacy, their domestic workload and their low agro-pastoral production due to the land problem.

Gender and rice production in the project zones: Currently, there is a very low proportion of women as heads of rice farms and in the decision-making bodies of member cooperatives. The married or widowed woman can benefit from their husband's plots, but the work causes their children or hired labor to do the work. In terms of processing and / or marketing, the development of rice cultivation has received an indelible imprint from women parboilers. They generally participate in the processing (through parboiling) and marketing of paddy rice. These women are located in the river valley particularly in the areas of Tillabéry, Niamey and Gaya where they are grouped into groups or unions of women steamers.

Nigeria

Gender and rural agricultural labor: In many parts of Nigeria, men have a claim over women's labor, but women do not have a similar claim over men's labor. For example, women in male-headed households are obliged to work in fields controlled by men, which take precedence over their own. Similarly, women face difficulty in obtaining sufficient labor during peak activities. They are also unable to hire labor, due to cash shortage. Women engage in agricultural activities and provision of food for both subsistence and commercial purposes, just like their male counterparts. They are also involved in processing and marketing of agricultural products, as well as decision-making for pricing of goods and commodities and household welfare. Men dominate in most activities involving drudgery, such as land preparation, clearing, weeding, transport and wholesale operations along the value chain.

Gender and land: According to the British Council (2012), women own 4 percent of land in the North East, and just over 10 percent in the South East and South West. The World Bank (2014) reported gender disparity in plots managed by men and women in northern and southern zones. Key gender differences exist in land size, fertilizer use, labor and other household characteristics. In the northern zone, plots managed by women produce 27 percent less (in terms of gross value of output) per hectare than plots managed by men. Similarly, in the south, plots managed by women appear to produce substantially less per hectare than plots managed by men. The majority of land is owned by men, since they have more rights to land ownership than women. Despite the roles played by women in agriculture and society, and the critical nature of land for production, women are often discriminated against in land ownership, especially in the case of inheritance. In rural communities, inheritance is seen as the prerogative of men and constitutes a determinant in land

ownership. This is the result of culturally embedded discriminatory beliefs and practices, both in customary and formal land tenure systems (Emeasoba, 2012). There is a need for the Federal Government to articulate legislation on property and land rights protecting personal safety and gender equality. Land ownership and control in Nigeria is still dominated by men in terms of average land size apportioned to farming activities with widespread gender disparity (men 7.5 ha, women 0.8 ha).

Gender and agricultural value chains: An analysis of the cassava value chain in Nigeria from a pro-poor and gender perspective of farming households in southwest Nigeria shows that 36.7 percent of men were involved, compared with 79.3 percent of women (Apata, 2013). Women are also involved in the sale of packaging materials used for most crops and processed foods, such as garri, maize and yam flakes. Men exclusively play the role of intermediaries, across the value chain. Women are less closely involved in wholesale, being more active on the retail side, especially in open-air markets. Women find it more difficult to enter the wholesale market due to limited education, funds and low social status. Interventions are needed to improve the efficiency and equity of the value chain, and thereby maximize the benefits received by its participants. Imbalances in economic and management empowerment limit women's participation, income and control of household expenditure.

Gender and rice production in the project zones: In the project intervention areas, it has been noted that men are more involved in tilling the land, while women are involved in planting, weeding, processing and trading. Both men and women are engaged in rice harvesting and threshing. Women play a major role in domestic rice processing. While about 20 percent of women rice farmers are engaged in production, about 80 percent of them are engaged in both processing and rice trading.

Senegal

Gender and rural agricultural labor: Because of their status considered inferior, women have less access to the labor force than men in the exploitation of their plots. This explains why they mostly farm small areas of around 0.4 ha while men farm an average of 1.3 ha (2015 figures). In addition, women do not manage to maintain their plots properly not only because of the overload of domestic work and lack of sufficient labor for tillage, but also because of their poor access to agricultural inputs such as than phyto-sanitary products (herbicides, etc.) and agricultural equipment; and this, despite their participation in agricultural work up to 62.6 percent in rural areas. On the other hand, men, because of their status as head of the family, are able to mobilize the family workforce. They control 93.6 percent of cultivated areas against 6.4 percent for women, with the exception of rain-fed rice cultivation practiced in the regions of Kolda, Sédhiou and Ziguinchor where women farmers operate 62.7 percent of the plots.

Gender and land: In Senegal, the existing disparities in terms of access to land, largely in favor of men, can be explained, by customary practices and religious influences, which have established social norms and values governing the modalities of access, use and ownership's transfer modes of cultivable land. Access to land remains a crucial issue in the lives of rural women who are most involved in agricultural production chains. To access land, women are forced to resort to various processes, the most common of which are access through borrowing from the family and / or through women's organizations, loans and rentals. Thus, the analysis of statistics disaggregated by sex shows a persistence of disparities in access to land. Indeed, 13.8 percent of women own their plot against 86.2 percent for men; 23.2 percent of women rent the land against 76.8 percent for men; 40.7 percent of women borrow land against 59.3 percent for men; and 14.3 percent of women rent out against 85.7 percent of men in 2014 (DAPS).

Gender and agricultural value chains: As per agricultural value chains, women are less integrated and play the least qualified roles than men because of their low levels of literacy and education, their low income and their limited access to factors of production (capital, land) and financing. They are often simple employees while the men occupy the managerial functions. They also dominate the activities generating higher added value thanks to their strong purchasing power allowing them to acquire means of production. For the crop production sub-sector, at the level of the various links in the agricultural value chains, women are more present in the work of sowing or transplanting and harvesting, in the processing, conservation and marketing of agricultural products while men are more involved in the supply of inputs and production (phyto-sanitary treatment, watering, soil preparation, spreading of manure).

Gender and rice production in the project zones: In the targeted regions, producers made up mostly of women do the hulling and packaging mainly for home consumption in addition to paddy production activities. Service activities such as the sale of inputs, processing and marketing are almost non-existent as distinct segments. The tillage is carried out manually by the men in Lower Casamance and by women in Middle Casamance and in the Fatick area. Women carry out sowing, nursery maintenance, transplanting and all cultural operations up to the post-harvest stage.

Sierra Leone

Gender and rural agricultural labor: The employment structure of Sierra Leone has not changed much in the last 25 years. Women represent about 49.2 percent of the employed population force. About 63 percent of women are employed in agriculture against 56.4 percent of men, meanwhile 4.9 percent of women are employed in the manufacturing or secondary industry against 12.2 percent of men. In the formal or service sector, women comprise 28.5 percent with being men having 23.3 percent. Although gender inequalities are challenging to quantify in the agricultural sector, there are gender differences in access to land, market and technology, the inexistence of non-contractual agreement in formal markets. The informal market were women predominantly work have no work benefits, as there is no adherence to labor laws regarding maternity leave, wage gap, issues of violence, health and safety for rural women (World Bank, FAO & IFAD, 2009). In addition, casual or temporary workers in poor communities, most likely women, do not have access to medical, unemployment benefits and pension. This gender difference in employment could be attributed to discriminatory practices that accord less value to women's labor in society. Society has also ascribed a reproductive role to women and

productive roles to men, so it is no surprise that women are disadvantaged in paid employment, or where they are employed, work under deplorable situations.

Gender and land: Sierra Leone have a dual system of land tenure: the communal land system where land is vested in the Government and the customary land system where land belongs to a particular family in the community. In the Provinces, women's access to land is determined by traditional and religious customs that remain deeply rooted in patriarchal value. The tenure system in Sierra Leone lacks proper legal definitions and clear allocation procedures of property rights in land, owing mainly to the unwritten nature of customary law. This creates confusion and legal insecurity (country profile, gender land rights database). Cultural and local practices discriminate against women when it comes to ownership of land, and in rural areas these practices are often more powerful than the written law, which allows women to own land. Sierra Leone society practices patrilineal inheritance, so land is generally passed down from father to son. In situations where fathers do not have sons, the brothers, nephews or other male relatives inherit the property. Women (daughters) do not usually inherit land in rural areas, even though they are of the same lineage. This practice is associated with the belief that since daughters are married off to another family or community and since wives are part of the responsibility of the husband, giving land to women entails that it will be controlled by the husband and his lineage. This practice is responsible for land disputes between men and women, such as those between brothers and sisters upon the death of parents, and between a husband and his first wife once he marries a second wife, or if a couple divorces. In addition, women face the risk of losing control over the land when their husband dies or if they divorce. Male children from the marriage inherit the land but if there are no children and if a woman remarries into her late husband's family, she can continue to cultivate the land. A woman who returns to her patrilineal family regains her rights to land for cultivation from the male head of her family (country profile, gender land rights database).

Gender and agricultural value chains: With regard to the value chain, women and men have different responsibilities along the chain of production. The division of labor implies that there is gender specific knowledge along the value chain of production. The challenge to this is that neither women nor men may have a complete knowledge of all the different steps in the value chain. In addition, within the value chain, there is a conflict between men and women in terms of right to access and ability to control productive resources – land, input and information. Women producers are predominantly found in the horticulture sector. This is attributed to a number of factors but is primarily because women's reproductive roles within their families' limits their being able to undertake management of medium- or large-scale commercial farms, compared to men. This implies that rural women have limited opportunity to access the formal sector in urban and developed markets. The increased demand for high value products such as vegetables could have been an opportunity for women, however, the same is undermined by women's lack of control over their agricultural production, processing and marketing.

Gender and rice production in the project zones: There is a clear gender dimension in rice production, processing and marketing. Men are mostly involved in brushing, felling and land preparation, while women are heavily involved in planting and weeding. Harvesting is almost equally shared between the sexes while processing and marketing of rice is predominantly done by women. The rice market is now dominated by four importers, three of whom operate as a cartel. Entry is restricted mainly by the capital requirements of the trade. The system of marketing domestic rice, which is dominated by women, is quite traditional involving Assemblers, Wholesalers and/or Itinerant Merchants and Retailers.

Togo

Gender and rural agricultural labor: In the agricultural sector, women are present at all stages of production. They contribute to weeding, sowing, harvesting, and storage, processing of products and marketing (MPASPF, 2006: 32). In Togo, rural women generally cultivate two different plots. Their "personal" plot that they obtain after marriage, generally small areas whose income is used to feed the family (GIZ, GFA, ProSeCal, 2016) was the "common" or family farming operation on which, only men exercise absolute power over both the direct and effective enjoyment of the fruit and the distribution of tasks, especially in the event of a polygamous marriage. When it comes to the organization of work on the family farm, men and women play different roles. Man is primarily responsible regardless of his land status, owner or not. He therefore manages the land, decides on the crops to be cultivated, the areas to be cultivated and the working periods of each member of the household on his various fields. It is he who also manages the family and outside labor, in particular its use in the family fields placed under his authority. He is also the one who manages the expenses, harvests and income of these fields. It also deals with the production of the main food crops (maize, yam, sorghum, cowpea, etc.), cash crops (coffee, cocoa, cotton, oil palm, teak, etc.) and all the others crops that could provide him with sufficient income.

Gender and land: In Togo, land generally belongs to individuals or to communities and groups of families. Individuals can access land by several modes. Access to land ownership is either permanent (inheritance, purchase, gift) or temporary (rental, usufruct, sharecropping, mortgage) (CAFE, PASCRENA, 2014). From a legal standpoint, two land tenure systems coexist in Togo. In accordance with the Land Ordinance of February 6, 1974, land can be held either by title to land or under customary law. This ordinance places customary law on an equal footing with registered property rights. Access to land does not appear to be a major problem for women and men since exploitable land is available for both sexes. Thus, according to the National Agricultural Census of 2013, few agricultural households do not have plots: 2.2 percent or 11,225 households including 3,903 households managed by women (1.7 percent). On the other hand, more than half of households (55.5 percent) own between one and four plots regardless of the sex of the household head, with respectively 75.4 percent of female-headed against 51.1 percent of male ones. 411,382 households headed by men own at least one plot compared to 85,992 for women. Available data shows that in 2011, about 25 women for every 100 men owned land or farms in rural areas (IDISA, 2012). The 2013 National Agricultural Census shows in particular that female

heads of household have smaller plots than their male counterparts. The concentration of agricultural households according to the size of farms is, for men, in the range of 1 to 3 hectares and, for women, in the range of 0.5 to 2 hectares.

Gender and agricultural value chains: The agriculture sector is relatively inefficient and generates little specific added value. It is weakly integrated into the markets and generates little on-site transformation. Women producers are economically disadvantaged. State investments have made it possible to increase food production, but shortcomings persist with regard to sustainable and efficient production systems, technical and organizational skills and innovative business models. In the distribution of roles, in general, we note a certain survival of traditional practices of sharing roles, even with regard to occupations at the level of collective activities of cooperatives. Women are more often assigned fewer physical tasks (cooking, drawing water, watering, drying crops, sorting products, watering / feeding poultry, etc.), unlike men who engage in more strenuous activities (space planning, wood cutting, transplanting, transport / weighing, etc.). Women mainly provide the transformation component in value chains. They transform soybeans into flour, cheese and milk. The women do the processing of pineapple by hand into juice. When it comes to the semi-industrial processing of pineapple into juice and dried fruit, there is a large female workforce in small agribusiness companies generally managed by men.

Gender and rice production in the project zones: In Togo, the agricultural sector remains the area where the female workforce is more present. In general, it represents nearly 60 percent of agricultural workers and as much in the rice sector. As in all other crops, production activities that require force (clearing, plowing, weeding) are mainly provided by men. Harvesting and post-harvest activities including shelling are mostly carried out by women and to some extent children. The marketing of rice is the preserve of women. Very active in production areas and operating in the informal sector, they collect and distribute white rice, as wholesalers and retailers. The men who no longer have a monopoly on access to land own most of the rice farms. However, thanks to various programs to promote income-generating activities for women and especially rural women, it is not uncommon today to see women set up in rice production.

Gender issues surveyed over stakeholder consultations

Main constraints	Lack of land ownership Lack of equipment Absence in decision making bodies Lack of opportunities for value-chain development
Support needs	Operational capacity building (equipment): power tillers, weeders, seeders, trans-planters, harvesters, threshers Capacity building for climate-resilient rice production Capacity building programs to empower women in entrepreneurship, alternative means of subsistence and business plan design
Labor Division for Rice Farming - Suggestion for project design	Consultations showed that women find it difficult to secure access to land and financial opportunities. The suggested activities are: - Development of activities not requiring land ownership - Strengthen the organization of women's groups - Set up dedicated funding for women

Common barriers to gender balance and equity in rice production in the thirteen countries

Social and cultural norms in the thirteen targeted countries impose several constraints on women. The **gendered division of labor** in the households place the burden of securing water and fuel supplies, as well as caring for children and the elderly entirely on women, leaving them with very little time to engage in income-generating activities or to further their education. Women's high burden of unpaid care and domestic work leave them less able than men to invest their time in agricultural work, particularly in polygamous households. Even in countries where women's right to own land is legally recognized, the majority of the land continues to be owned, passed on to (inheritance) and controlled by men. These norms reduce the amount of time that women have available for their own plots and their likelihood of investing in higher-value, higher-maintenance crops. Women often lack security of tenure for the land they cultivate and are therefore often unable to benefit from extension services and access to finances to invest. It also makes them less likely to plant high-value crops.

Almost every country has created a **national gender policy or strategy** as described in section 3.1. However, legislation that discriminates against women still exists. In practice, gender is usually considered as an after-thought and gender policies are often not implemented effectively. Patriarchy and lack of political will, a conflicting tripartite legal system of civil, customary and Sharia laws, coupled with scarce resources impede the effective implementation of any gender responsive legal and regulatory framework. In some countries, attempts by the state to introduce laws promoting equality and gender equity in the past were met with strong resistance from religious organizations, as was the case in Niger and Mali in relation to the Family Code. However, through communication and advocacy actions carried out by civil society organizations, projects and programs implement activities that take into account gender equality and equity.

The project will have to consider these constraints related conflicting tripartite legal systems and patriarchal systems deeply rooted in religious and customary social standards and use the same channels (community and customary) to implement the activities. **The aim will not be to challenge social norms, but to gain acceptance of the project's**

principles of intervention and specifically address the needs and priorities of women and marginalized groups in each of the selected countries and regions.

Commonly held beliefs on the roles of men and women, social norms and customs, and culture form the platform upon which rules governing the operation of formal systems are built, including **producers' associations** and microcredit institutions. It is hardly surprising, given the dominance of patriarchal ideologies, which laws and regulations often remain gender unequal. Thus, beyond being restricted by cultural expectations and ideologies regarding their activities, women are also disadvantaged by laws, which preclude or constrain their access to land, productive inputs and finance.

An important limitation to developing the **rice sectors value-chain** in West Africa, is the lack of sufficient long-term financing. Beyond financing, numerous challenges were highlighted by the questionnaires from countries. The challenges are related to the need for: i) holding down per-unit costs throughout the value chain (including at the farm level); ii) financial incentives for farmers for careful drying and storage of paddy to ensure better processing outcomes; iii) improved systems for paddy aggregation and assured delivery to processors; and iv) improvements in wholesaling, packaging and marketing of milled rice.

GENDER ACTION PLAN

In the thirteen countries in this project, women play a fundamental role in rice cultivation and therefore, any effort to strengthen the climate resilience in this sector must take measures to ensure that the support and benefits offered reach women and that they actively engage in the process. This gender action plan for the RICOWAS Project has been designed precisely to promote gender principle described in the AF gender policy such as balance, equity, mainstreaming, and empowerment. According to the regional context, the project has set a quota of 40 percent of the activities under the each of the component to be allocated to women. It will also contribute to inclusive employment strategies, increase women's opportunities in the labor market and raise the living standards of vulnerable groups, including women. Finally, and most importantly, it will increase their access to agricultural techniques and technologies and build their capacity to use climate resilient farming practices. The country assessments above indicate a series of common factors that must be taken into account in the project's design and implementation to ensure that it is effectively strengthening women smallholder farmers' resilience to climate change:

- **Gendered division of labor:** Cultural beliefs and norms govern daily life in the rural areas. Women are expected to assume full responsibility for housework and care for the family, which is unpaid, and certain norms limit their engagement in economic activities outside the home. Only a small percentage of women have paying jobs or own small businesses. They lack financial resources to invest in machinery, technologies and crops that bring higher returns.
- **Property rights and control over assets:** Due to cultural beliefs and practices, only a minority of women own land and few have adequate and stable access to land and agricultural inputs. The lack of assets in their names is an important impediment in developing viable businesses and in obtaining loans, as they have nothing to offer as collateral. This remains a major challenge and prevents financial institutions from providing loans.
- **Lack or no awareness of financing opportunities and new instruments** (like SRI). Rural women generally lack knowledge on the financial options available to them with the financial institutions as men control the resources. This is mainly due to lack of financial education and prevailing social and cultural norms. Women have very little to no understanding of climate risk transfer (agricultural insurance), which could strengthen their resilience to climate shocks depending on the intensity and magnitude.
- **Lack of education:** Women in rural areas in West Africa have lower education and literacy levels than men, and birth rates are high. They also lack access to knowledge and information to develop their own businesses.
- **Lack of participation:** Because of increased competition and uncertainties in domestic (and export) markets, female producers need to engage in collective processes to better i) manage their assets, ii) access services, inputs, credits and markets, and iii) contribute more effectively to decision-making with value-chain partners. The development of strong economic organizations can enable poor women to overcome high transaction costs, limited scales of production, poor access to a variety of resources and lack of political and bargaining power as individuals.
- **Value chain:** Women producers' organizations may contribute to develop innovative approaches to product development, processing and marketing, which can help poor women without key productive assets (such as land) to enter value chains. In addition to the obvious economic advantages of such strategies, members of these creative groups, particularly women, improve self-confidence and their status in the community.

The Gender Action Plan summarizes the project interventions identified to address the gender gap in the selected countries.

Gender Action Plan for the RICOWAS project

Components/Outcome/Output/Activity		AF Gender Principle	GAP Actions	Indicators
Component 1: Strengthen human and institutional capacity in climate-resilient rice production (CRRP)				
Output 1.1.1	Activity 1.1.1.1. Analysis of the impacts of climate change on rice production in West Africa	Representation and participation	▪ Ensure that women/girls are represented during workshops; ▪ Interview of women during the studies ▪ Use sex disaggregated data	% of women participants in workshops Nb of women interviewed
	Activity 1.1.1.2. Regional validation workshop and dissemination of analysis	Participation, representation		
	Activity 1.1.1.3. Development of rice sector adaptation action plans for climate change to be integrated to the Rice Offensive Strategy (ROS)	Participation, representation		
	Activity 1.1.1.4. Regional validation workshops and dissemination of the rice sector adaptation plan	Participation, representation		
	Activity 1.1.1.5. Development and dissemination of rice sector briefs and methodologies to integrate climate change adaptation to rice value chain	Participation, representation		
Output 1.2.1	Activity 1.2.1.1. Support the development of SRI-CRRP adapted practices, rice growing equipment and tools	Participation, representation, equity and access	▪ Ensure that women/girls are among the researchers ▪ Develop equipment adapted to women and girls ▪ Use sex disaggregated data	Nb of written from women Nb of equipment adapted to women
	Activity 1.2.1.2. Establishment of a regional technical group to review the advancement of SRI and CRRP best practices	Participation, representation, equity and access		
Output 1.2.2	Activity 1.2.2.1. Undertake capacity needs assessment	Participation, representation	▪ Ensure that women/girls are represented during workshops ▪ Use sex disaggregated data ▪ Ensure that timetables, places and resources take care of women needs and constraints	% of women participating in field visits and meetings
	Activity 1.2.2.2. Undertake demonstration field visits at national and regional levels to share and exchange good practices	Participation, representation, equity and access		
	Activity 1.2.2.3. Acquisition of necessary logistics material to support field implementation	Participation, representation, equity and access		
	Activity 1.2.2.4. Support the process of upscaling the REE and strengthening its capacities to promote SRI-CRRP in the region			
Output 1.2.3	Activity 1.2.3.1. Undertake Training-of-Trainer (ToT) workshops on SRI- CRRP	Participation, representation, equity and access	▪ Ensure that women/girls are represented during trainings ▪ Use sex disaggregated data ▪ Ensure that timetables, places and resources take care of women needs and constraints	% of women participating in field visits and meetings
	Activity 1.2.3.2. Develop, revise and produce training materials and modules for SRI, SLWM and other relevant CRRP technical topics	Participation, representation, equity and access		
	Activity 1.2.3.3. Support farmer field implementation of CRRP by extension institutions with adequate materials and resources			

COMPONENT 2. Assist farmers to scale-up CRRP				
Output 2.1.1	Activity 2.1.1.1. Support the adoption and scaling-up of best practices of SRI in farmers' fields	Participation, representation, equity and access	▪ Ensure gender inclusiveness and deliberately of at least 37% participation of women and girls as the main beneficiaries of project interventions ▪ Dedicate training sessions to women, which are adapted to their needs and constraints; ▪ Design gender focused/inclusive training plans. ▪ Use sex disaggregated data; ▪ Ensure that timetables, places and resources take care of women needs and constraints	% of women attending to trainings % of women benefiting equipment and assistance
	Activity 2.1.1.2. Promote and assist farmers in executing SLWM practices in association with their SRI fields.	Participation, representation, equity and access		
	Activity 2.1.1.3. Promote and assist farmers in rice seed and organic fertilizer production.	Participation, representation, equity and access		
	Activity 2.1.1.4. Provide farmers with technical expertise to implement best practices for CRRP	Participation, representation, equity and access		
	Activity 2.1.1.5. Provide farmers access to equipment and tools to implement SRI-CRRP			
Output 2.1.2	Activity 2.1.2.1. Develop and test data tracking methodology and mechanism on the implementation of SRI and CRRP	Participation, representation	▪ Use sex disaggregated data;	
	Activity 2.1.2.2. Implement the baseline study on rice production and value-chain characteristics,	Participation, representation		
	Activity 2.1.2.3. Provide agents of national institutions and extension services, researchers and smallholder rice farmers with the expertise to use the data tracking methodology	Participation, representation, equity and access		
	Activity 2.1.2.4. Update the data analysis and CRRP tracking database annually and publish its key performance indicators and results on the project website			
Output 2.2.1	Activity 2.2.1.1. Establish networks and create partnerships between private companies and producer cooperatives	Equity, Mainstreaming, empowerment	▪ Ensure that women are targeted accessing diversified production and processing opportunities; ▪ Ensure that timetables, places and resources take care of women needs and constraints; ▪ Use sex disaggregated data;	Nb of women accessing diversified production and processing activities Nb of women beneficiaries of production and processing equipment
	Activity 2.2.1.2. Generate PPP for the supply of innovative agricultural equipment and their provision to farmers	Equity, Mainstreaming, empowerment		
	Activity 2.2.1.3. Generate PPP for threshing, processing, packaging and marketing of climate-resilient rice for vulnerable groups of the project (especially women and youth)	Equity, Mainstreaming, empowerment		
	Activity 2.2.1.4. Generate PPPs for the supply of organic fertilizers, and rice seeds produced by smallholder farmers.	Equity, Mainstreaming, empowerment		
Output 2.2.2	Activity 2.2.2.1. Reinforce and assist in the establishment of agricultural associations and cooperatives	Equity, Mainstreaming, empowerment	▪ Ensure equitable participation and representation of women and men in	Nb of training sessions dedicated to women
	Activity 2.2.2.2. Provide and reinforce advisory services to agricultural associations and cooperatives	Equity, Mainstreaming, empowerment		

	Activity 2.2.2.3. Provide assistance to agricultural associations and cooperative in accessing and managing agricultural credits and subsidies	Equity, Mainstreaming, empowerment	cooperatives, associations and saving groups; ▪ Ensure that women benefit from processing equipment; ▪ Ensure equitable participation and representation of women and men in all stages of the value chain.	Nb of women accessing all stages of value chain
COMPONENT 3. Strengthen communication, advocacy and partnerships to scale-up CRRP				
Output 3.1.1	Activity 3.1.1.1. Development of a communication strategy and plan.	Participation, representation, equity and access	▪ Focus on gender when developing the communication strategy; ▪ Dedicate awareness campaigns to women conducted by women and adapted to their needs and constraints; ▪ Ensure that women access project results, best practices and lessons learned ▪ Ensure that timetables, places and resources take care of women needs and constraints; ▪ Use sex disaggregated data	% of women reached by the communication strategy Nb of climate change and CRRP awareness campaigns dedicated to women Nb of written and non-written knowledge products e.g., documents on lessons and best practices from project interventions distributed to women Nb of case studies and lessons learned from women documented and shared among women and men
	Activity 3.1.1.2. Development of a user-friendly web-based platform for SRI and CRRP methods			
	Activity 3.1.1.3. Production of documents, videos, radio shows, maps.			
	Activity 3.1.1.4. Organization of knowledge-sharing events and exchange visits at local, national, regional and global level including Asia, Latin America and other parts of Africa.	Participation, representation, equity and access		
	Activity 3.1.1.5. Writing, dissemination and presentation of policy and advocacy briefs on climate adaptation strategies and project impact for rice production and its role in adapting to climate change.			
Output 3.2.1	Activity 3.2.1.1. Setting up of operational mechanisms for information-sharing, networking, and coalition-building for the scaling-up of CRRP	Participation, representation, equity and access	▪ Ensure that women/ girls are represented during field visits; ▪ Use sex disaggregated data	% of women participating in the meetings and field visits
	Activity 3.2.1.2. Development of national networks that integrate all SRI and CRRP activities.	Participation, representation, equity and access		
	Activity 3.2.1.3. Organization of annual national events on rice and its linkage with climate change in West Africa	Participation, representation, equity and access		

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Annex 4 Cost Effectiveness Analysis

Study Report for Full Proposal

Cost-Effectiveness Analysis of the RICOWAS Project

INTRODUCTION

Rice is a staple crop in West Africa and largely produced by low-income smallholders across the entire region. Rice plays a key role in regional food security for rural and urban populations. In recent years, increasing demand stemming from population growth and steady increases in annual per capita consumption has outpaced production leading to ever-increasing rice imports from Asia, accounting for 46% of total rice consumption in 2017 (FAOSTAT, online data base; Styger and Traoré, 2018). This places a heavy burden on government budgets and exposes the region to the volatility of world market prices. In response to that, a regional initiative called "Rice Offensive", which was launched by the Economic Community of West African States (ECOWAS) in 2013, is aimed at achieving rice self-sufficiency by 2025.

West Africa has been identified to be particularly vulnerable to climate change and has already experienced significant changes over past 50 years, with temperature increases from +0.5 to +0.8 °C between 1970 and 2010, with an increase in the number of warm days and warm nights, a decrease in number of cold days and nights. Precipitation exhibited higher seasonal and spatial variations, resulting in delayed onsets and early retreats of the rainy seasons, and in increased frequency of heavy rainfall events (Sultan and Gaetani, 2016).

Climate change forecast indicate that temperatures in West Africa will rise between +1.5°C to 3°C by 2050, and between 3°C and 6°C by the end of the 21st century, with the greatest warming in the Sahel. There is also a highly likely increase of frequency of hot days, as well as long-lasting heat waves (of +6 to 28 days) with higher increase in the eastern part of West Africa by 2050. The patterns in precipitation change are less clear, with an uncertainty ranging between – 30% to +30% for the West African region. But most models predict decreasing rainfall for the Western Sahel, and especially for the last three decades of the century, West Africa average rainfall is predicted to decline with a longer dry spells, increase in frequency and intensity of extreme precipitation, and shorter rainy season and growing seasons. Sea levels along the coast of West Africa will continue to rise between 13 cm and 56 cm over the course of the century (IPCC, 2014; Riede et al, 2016; Sultan and Gaetani, Sylla et al, 2016; 2016; USAID, 2018).

Without adaptation measures, estimated reductions in rice yield across West Africa range from 5-25% and up to 80% depending on location and rice system. The combined effects of climate change impacts, population pressure and human activities, will increase the pressure on the natural resources, resulting in land degradation and overexploitation, which in turn threaten rural livelihoods and economic development (Jalloh et al, 2012; Van Ort and Zwart, 2018).

In response to these challenges, the RICOWAS project will be implementing a climate-smart rice production approach that aims at a triple win. It not only targets adaptation but also the increase in crop productivity and the mitigation of greenhouse gases. The project will develop and implement the Climate-Resilient Rice Production (CRRP) approach, which is based on the System of Rice Intensification (SRI) methodology in combination with location-specific sustainable land and water management practices (SLWM), and if indicated with integrated pest and disease management (or IPM).

By implementing CRRP, critical economic, social and environmental challenges can be addressed simultaneously: CRRP will respond to increasing rice consumption needs, strengthen livelihoods of rice farming communities, allow for diversification of economic activities along the rice value chain, improve the overall national economic well-being, free up hard currency – previously used for rice imports - for other national needs, and contribute to political stability. CRRP is built on an integrated soil and water management approach that helps to restore and maintain land productivity. This is done through appropriate practices, which will enable land users to maximize the economic and social benefits of the land while maintaining or improving the ecological support functions of the land resources. (TerrAfrica, 2009, cited by UNCCD, 2019)

The regional RICOWAS project entitled "Scaling up of Climate-Resilient Rice Production in West Africa, RICOWAS" will be implemented in 13 ECOWAS countries: Benin, Burkina Faso, Côte d'Ivoire, Gambia, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo. The Sahara and Sahel Observatory (OSS) is the Regional Implementing Entity, and the Regional Executing Entity is the ECOWAS-sponsored Regional Rice Specialization Center (CRS-RIZ/IER-Mali), working in partnership with Cornell University, USA (Climate-Resilient Farming Systems program).

The global objective of the RICOWAS project is to **improve climate resilience and increase rice system productivity of smallholder rice farmers across West Africa using a climate-resilient rice production approach**. More specifically the project will:

- Strengthen the resilience and capacity of smallholder rice farmers and other rice stakeholders in the region to use agro-ecological and sustainable land and water management strategies that respond to the climate change threats in their respective localities.
- Assist farmers to implement and scale-up Climate-Resilient Rice Production (CRRP), and to participate in other economic activities of the rice-value chain.

- Support a communication platform and engage in advocacy to promote efficient exchange of knowledge and expertise among diverse stakeholder groups in West Africa and beyond.
- Facilitate the establishment of a coalition of partners at national and regional levels for the scaling-up of CRRP.

In order to achieve these specific objectives, the RICOWAS project will be structured around three main components:

- Component 1: Strengthen human and institutional capacity in CRRP
- Component 2: Assist farmers to scale-up CRRP
- Component 3: Strengthen communication, advocacy and partnerships to scale up CRRP

The project will build on existing human and institutional capacities and on the achievements of the SRI-WAAPP regional project "Improvement and Scaling up of the System of Rice Intensification (SRI) in West Africa - SRI-WAAPP 1st phase (2014-2016)". SRI-WAAPP was coordinated by the National Center for Rice Specialization (CNS-RIZ/IER/Mali), with the supervision of the West and Central African Council for Agricultural Research and Development (CORAF/WECARD) and under the institutional umbrella of ECOWAS. It was financed by the World Bank.

ALTERNATIVES CONSIDERED FOR THE COST-EFFECTIVENESS STUDY

The RICOWAS project will create significant economic, social and environmental benefits and impact at the household level, the community level, the national as well as the regional level.

This cost-effectiveness analysis will assess two alternatives:

- Alternative 1: The alternative to the RICOWAS project of no-project-intervention, or the continuation of the sectoral approaches in rice production as currently underway in West Africa.
- Alternative 2: The economic, environmental and social benefits that the proposed RICOWAS interventions are expected to create in respect to rice productivity increase and livelihood improvements, environmental protection, mitigation benefits and adaptation to climate change.

Additional alternatives, not considered in the analysis:

The most important alternative rice production systems to the conventional, flooded paddy systems in West Africa include i) the System of Rice Intensification (SRI), ii) the Alternate Wetting and Drying (AWD) system, iii) the aerobic rice system and iv) the direct-seeded rice systems. All these systems strive to lighten the environmental footprint of rice production by reducing the use of irrigation water. They also target the reduction of input costs, most importantly costs for irrigation and labor. When considering yield, water saving and net return, the SRI system outcompetes the other systems clearly (Table xx). The cost-effectiveness analysis will compare the SRI system with the conventional system. Comparing the performances of the other systems regarding yield, water savings and net return is shown in Table 1.

Table 1: Comparison of yield, water use and net return for four alternative rice systems to the conventional, flooded paddy rice system (at 100%)

Rice System	Yield (%)	Water use (%)	Net return (%)
Conventional, flooded paddy rice	**100**	**100**	**100**
Aerobic rice	50-85	45-50	57
Direct seeded rice (DSR)	90	80	115
Alternate Wetting and Drying (AWD)	75-95	60-75	105-135
System of Rice Intensification (SRI)	130-180	50-80	195

(Sources: Bouman et al. 2005; Carrijo et al. 2017; Geethalakshmi et al. 2011; IRRI. 2016; Kumar and Ladha. 2011; Lampayan et al. 2015; Mandal et al. 2015; Nie et al. 2012; OSS 2021; Parthasarathi et al. 2012; Yamano et al. 2016; Yao et al. 2012.)

The alternatives that are considered in the analysis are further described hereby:

- **Alternate Wetting and Drying system (AWD)** adopts – as does the SRI systems – intermittent flooding regime of the rice paddies, which allows up to 50% of water. The other crop production practices – contrary to SRI - remain the same as under the conventional system. This includes: planting older and multiple seedlings/hill, spacing the hills more closely to each other, and using chemical fertilizers. Compared to the SRI system, the practices of the AWD system result in less robust plants with limited tillering, shallow root growth, and being more drought and stress prone. Water saving and GHG reduction are the main benefits, while yields are most often declining or similar to flooded rice. For farmers with access to enough water, this method is not very attractive. Adoption challenges are reported in the literature. The

AWD method can therefore not compete with SRI-CRRP. (Carrijo et al. 2017; Geethalakshmi et al. 2011; Lampayan et al. 2015; Mandal et al. 2015; Parthasarathi et al. 2012; Yamano et al. 2016; Yao et al. 2012.)

- **Aerobic rice** production system is based on non-puddled, well-drained and non-saturated soils with specifically bred varieties. This system can save more water than the other systems and focuses on labor reduction. The yields are significantly lower and so are the net returns for the farmers compared to the other systems. The importance of this system has been limited, especially in Africa. (Bouman et al. 2005; Geethalakshmi et al. 2011; Mandal et al. 2015; Nie et al. 2012; Parthasarathi et al. 2012)
- **Direct seeded rice system** differs from the dominant method of transplanting as establishment method. It is either based on seed broadcasting (often a traditional method with low yields), or line seeding into wet or dry soil. The seed rates can vary but are often 10 times higher than with SRI. The main benefit of direct seeding lies in the reduction of labor. Yields are often slightly inferior to conventional rice, but with lower production costs the net return is often higher with direct seeding compared to conventional production (Geethalakshmi et al. 2011; Kumar and Ladha. 2011; IRRI. 2016; Mandal et al. 2015; Yamano et al. 2016; Parthasarathi et al. 2012). For the RICOWAS project, modified direct seeding integrating SRI principles can be considered in places where farmers have the opportunities for mechanized seeding and weeding, and where they cultivate larger fields.

It is important to note that there is never a one-size-fits-all system that works for all farmers in their different environments and conditions. The project will remain open to innovate and to integrate technical components from other systems to SRI, as they show potential and respond to farmers' interests and needs. CRRP is a variety-neutral approach, the use of **climate-smart rice varieties** is therefore complementary and not considered to be an alternative to CRRP. Used together, they will boost the benefits for productivity and climate adaptation even further. The CRRP approach will further increase the benefits of the SRI system through its integrated soil, water, pest and disease management and increase the resilience of the West African rice systems to adapt to climate change.

Alternative 1: RICOWAS project is not implemented

If the RICOWAS project is not implemented, CRRP and SRI are not scaled-up, and adaptation measures in rice production are insufficient and lacking.

> **Climate change impact on rice production without adaptation**

Without adaptation measures, estimated reductions in rice yield across West Africa range from 5-25% and up to 80% depending on location and rice system. The largest decreases of 40% to 80% are mapped for irrigated rice cultivation in the Sahel zone in the hot dry season, which is attributed to reduced plant photosynthesis at extremely high temperatures. In the same area in the wet season (slightly cooler), irrigated rice yields were predicted to decrease by around 40%. (von Ort and Zwart, 2017; Figure 1). In the Sudanian and Guinean climate zone, where rainfed systems dominate, rice yields will especially be affected. In the coastal areas, rice will be highly sensitive to the combination of increased temperature, humidity and rainfall intensity. It will become more vulnerable to pests and disease that thrive in warmer, wetter conditions, such as the rice gall midge, rice weevil, and bacterial leaf blight. In low-lying coastal areas, a relatively small rise in sea level can result in rice land inundation, followed by salinization of the land and the freshwater.

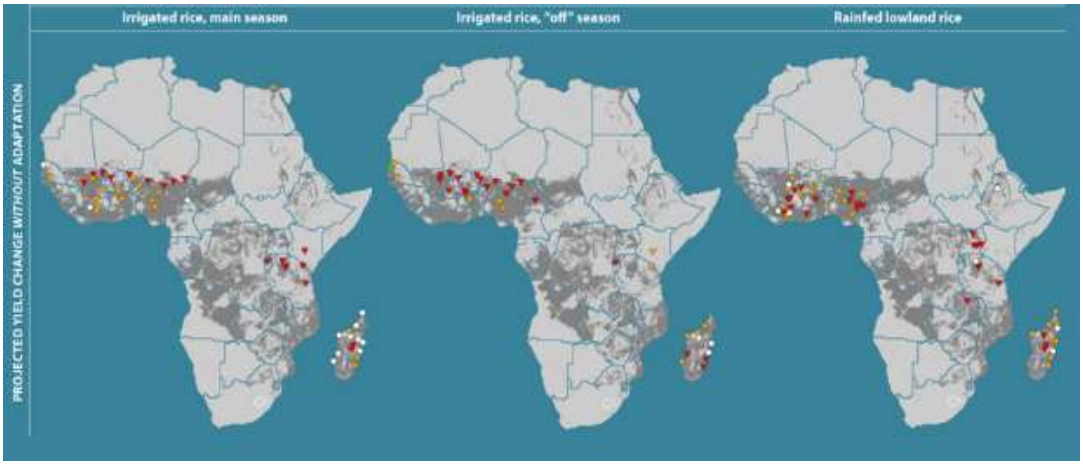

Figure 1: Projected yield change for rice production between 2000 and 2070 (based on IPCC RCP scenario 8.5) without adaptation measures, for irrigated rice in the main season and off-season, and for rainfed lowland rice production (van Oort and Zwart, 2017)

> **Vulnerability of current rice production practices and approaches**

The widespread and common rice production practices in West Africa are either traditional, marked by low yields, or those that depend on irrigation water use and on agrochemical inputs, which are often neither affordable for smallholders nor environmentally sustainable.

Vulnerability of current rice production systems are characterized as follows:

- High dependency on high-volume water usage at high frequency, low water use efficiency
- High dependency on agro-chemical inputs (fertilizers and pesticides)
- High dependency on newly bred rice varieties
- Difficulties to distribute quality seed to farmers
- Little attention paid to farmer developed technologies and innovations; little support provided to reinforce locally adapted and efficient solutions, e.g. traditional soil and water management practices, locally adapted crop varieties and cropping practices.
- Minimal attention and support to good agronomic practices, soil fertility management and agro-ecological approaches in rice production

With farmers trying to cope, it can be expected that pressure on natural resources will increase, be it on vegetation, soils or water, leading to overuse, degradation, potential conflicts, rural exodus and international emigration. To mitigate these effects, introducing adaptation measures and strengthening resilience is a necessity.

Environmental impact:

- Overexploitation of water resources
- Soil and land degradation, declining land productivity
    - Loss of soil organic matter, deteriorating soil structure, loss of soil water holding capacity
- Biodiversity loss within the production landscape
- Vulnerability to drought and extreme weather events increases, as resilience to withstand negative impacts is weakened

Social impact:

- Fluctuation and uncertainty in total crop production increases vulnerability of farming communities
- Food insecurity and hunger will increase
- Farmers might abandon agriculture, rural exodus, migration
- Political instability might ensue

Economic impact:

- High input costs for farmers, increase in financial debts, reduces ability of investments in new economic opportunities, reduces wealth of farming communities
- Crop yield decline and crop yield fluctuation from year to year, depending on rainfall
- Crop failure
- Loss of income, loss of food security
- Price increase of staple crop impacts urban population negatively
- Rice imports need to increase

> **Rice sector policies and strategies deficient in an integrated approach to climate adaptation**

Although climate change is a major concern in the current thinking and narrative of agricultural development in West Africa, adaptation measures have not been systematically addressed and integrated in the agricultural policies and strategies. In many of the key documents, climate change adaptation is hardly mentioned. Often the documents refer only to the promotion of varieties that are adapted to certain climate threats. The implementation of climate resilient methods and available adaptation strategies are often only lightly considered and presented in disconnection to each other. An integrated, holistic approach to develop climate-resilient healthy agricultural systems on the foundation of SLWM does not seem to be well developed yet. The current focus remains on input-oriented agricultural development. This can be witnessed in the following documents of the main rice policies in the region:

- The Regional Rice Offensive (ECOWAS, 2019)
- The National Rice Development Strategies (accessed under https://www.riceforafrica.net/)
- The Continental Investment Plan for accelerating Rice Self-Sufficiency in Africa (CIPRiSSA). In this plan, solutions are based on distributing seeds of improved varieties, agro-chemicals, promote modern agricultural mechanization, and setting-up irrigation schemes. Climate change is not addressed or even mentioned in this strategy. No adaptation and mitigation measures are proposed. The plan advocates for yearly investments from 318 million to 372 million per country, with largest portion of funds to be used for irrigation infrastructure and fertilizer acquisition (AfricaRice, 2018).

Addressing the increasing negative impacts of climate change on rice production will require large sums of resources that will need to be spend, among others on:

- Emergency food aid (rural and potentially urban population)
- Subsidies to agricultural sector to maintain a certain crop production level
- Subsidies to keep staple food prices affordable

- Increase in imports of rice
- Disaster relief and rescue efforts in response to climate change calamities: among others:
  - Damages from flooding, storms, wildfires, heat
  - Damages to natural resources, various economic sectors, infrastructure, personal properties
- Restoration of land and water resources

Alternative 2: RICOWAS project is implemented: CRRP is scaled-up throughout West Africa

The proposed alternative to the current situation concentrates on the use of a new approach developed for this project called **Climate-Resilient Rice Production (CRRP)**. CRRP is based on the rice productivity increasing methodology of the System of Rice Intensification (SRI) and complemented with locally adapted and improved soil and water management practices as well as with integrated pest and diseases management methods that are critical for the adaptation to climate change.

> **The System of Rice Intensification (SRI)**

The System of Rice Intensification (SRI), an agro-ecological and low-input methodology for increasing rice productivity. It allows to increase yields by 20-50% and more, while using 90% less seed, 30-50% less water and 30-100% less agro-chemicals. Based on the principles of early plant establishment, reduced competition among plants, enriching soils with organic matter, and reduced water use, rice plants grow more vigorous and can better express their genetic potential compared to conventional approaches. Healthier and stronger plants with deeper roots can better withstand weather calamities such as drought, floods and strong winds and assure (at least some) production, while conventionally planted crops succumb more easily to these forces leaving farmers without reduced or no harvests. Introduction of SRI to West Africa started in 2000 and confirmed these advantages. With growing interest in SRI across the region, a regional project "Improving and Scaling up the System of Rice Intensification in West Africa" (SRI-WAAPP) was commissioned and supervised by CORAF/WECARD, as part of the West Africa Agriculture Productivity Program (WAAPP), supported by the World Bank under the institutional umbrella of ECOWAS. The SRI-WAAPP project ran from 2014- 2016 in 13 ECOWAS countries: Benin, Burkina Faso, Côte d'Ivoire, The Gambia, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo. The project benefited more than 50,000 farmers of which 31% were women. Yields increased in rainfed lowland and irrigated rice by more than 50%.

> **Benefits of SRI**

Over the past 20 years, SRI has been introduced and validated in over 60 countries in Africa, Asia, Latin America and the Caribbean. The benefits of SRI have been widely researched and reported (SRI-Rice, 2021a). They vary of course by location, but they can be summarized as follows:

- **Higher crop productivity**: The combined changes in crop management result in plant phenotypes which give greater crop yields and have more resilience to stresses. Rice yields are improved by 20-50%, and often by more. Better grain quality often earns a higher market price; and when the rice is organically grown, its price can be even higher (Styger and Uphoff, 2016).
- **Increased income:** Whether production costs and labor requirements for SRI methods are higher, equal or lower than in conventional rice production will depend on the comparison to the current practice, the degree of intensification, and the types of changes needed to move to SRI practices. But significantly higher yield increases with SRI translate in higher labor and input factor productivity, and therefore raise farmers' income in most cases by 50% or more with SRI adoption (Thakur et al. 2013; Kathikeyan et al. 2010).
- **Reduced water requirements and greater drought resistance:** SRI plants thrive with 30-50% less irrigation water compared to continuously flooded rice. Reduced competition among plants in combination with aerated and organic matter-enriched soils creates stronger plants above and below ground with larger, deeper, less-senescing root systems, which can resist drought and extreme temperatures better. Also, organic matter-enriched soils are able to store more water as well as nutrients. (Jagannath et al. 2013; Sridevi and Chellamuthu 2012; Chapagain et al. 2011; FAO 2005). How many kilos of rice can be produced for each cubic meter of water used (or **water productivity**) becomes a highly important parameter. Several research studies have shown that in respect to water productivity, SRI is the most efficient agronomic method with 0.43-1.02 kg of rice produced/m3, compared to the alternate wetting and drying irrigation method alone, resulting in 0.39 – 0.54 kg/m3, and compared to flooded rice with 0.25-0.44 kg/m3 (Styger, 2018).
- **Higher pest and disease resistance:** Stronger and healthier rice plants are less susceptible to pest and disease attacks. Given the much lower plant density with SRI, less humidity builds up within the plant canopy as air can circulate more easily among the plants. This provides pest and diseases with a less favorable environment compared to densely planted and continually flooded conventional rice paddies (Karthikeyan et al. 2010; Visalakshmi et al. 2014).
- **Greater resistance to rain and wind damage from storms.** SRI plants have thicker tillers and deeper roots, and in combination with wider plant spacing, rice plants have shown to resist heavy rain and strong winds better than

conventional paddy rice. A study in Japan reported that during a storm event, 10% of SRI field lodged compared to 55% of an adjacent conventionally managed field (Chapagain et al. 2011).

- **Improved soils:** With the SRI method, soils are improved through regular organic matter additions, such as compost, animal manure, green manures or crop residues. Organic matter enriched soils hold more carbon, nutrients and water. They can nurture a larger soil biodiversity, which supports nutrient and water uptake by the plants and can protect plants from certain diseases. **Fertilizer use efficiency is improved** when fertilizers are applied to organic-matter rich soils compared to degraded soils. Farmers can therefore reach the same fertilizing benefits with 30-50% less fertilizer and save on input expenses.
- **Mitigation of greenhouse gas emissions:** SRI management contributes to mitigation objectives by decreasing the emissions of greenhouse gases (GHG) when continuous flooding of paddy soils is stopped, and other rice-growing practices are changed.
    - Methane (CH4) is reduced between 22% and 64% as intermittent irrigation (or alternate wetting and drying, AWD) means that soils have more time under aerobic conditions (Gathorne-Hardy et al. 2013, 2016; Choi et al. 2015; Jain et al. 2014; Suryavanshi et al. 2013).
    - Nitrous oxide (N2O) emissions increase only slightly with SRI or sometimes decrease as the use of N fertilizers is reduced. No studies so far have shown N2O increases offsetting the gains from CH4 reduction (Kumar et al. 2007; Visalakshmi et al. 2014; Vermeulen et al. 2012; Gathorne-Hardy et al. 2013, 2016; Choi et al. 2015).
    - Total global warming potential (GWP) from rice paddies was reduced with SRI methods in the above studies by 20-30%, and up to 73% in one of the studies (Choi et al. 2015).
    - Rice production's carbon footprint is reduced to the extent that less fertilizer and fewer agrochemicals are used. GHG emissions from producing, distributing and using these inputs equal about 5-10% of the global warming potential (GWP) from all direct emissions from food production (Vermeulen et al. 2012).
    - Soil carbon sequestration contributes to reducing atmospheric CO2, while also restoring degraded soils, enhancing biomass production, and filtering and purifying surface and ground waters (Lal, 2004).

> **Benefits of the CRRP methodology**

As mentioned above, CRRP is based on the System of Rice Intensification (SRI) methodology and complemented with locally adapted and sustainable land and water management practices (SLWM) as well as with integrated pest and diseases management methods (IPM), that can play a critical role in the rice systems' adaptation to climate change. Implementing CRRP will not only increase overall rice productivity, but also reduce irregularity in rice production as influenced by year-to-year climate variability, and better withstand devastating weather events that could otherwise lead to crop failure. The environmental, economic and social benefits resulting from the resilience of the CRRP systems and its adaptive response to climate change in West Africa has not yet been quantified. It is nevertheless clear that the benefits that accrue from associating SLWM and IPM practices with SRI will lead to additional benefits to already occurring SRI benefits, thus reinforce the ability of the SRI methodology to address climate change threats. These benefits can either be stacked and added to the SRI benefits, but most likely they will create synergetic effects.
When and how severe abiotic and biotic stresses - such as drought, floods, storm damage, stressful temperatures, and pests and diseases – will occur, is difficult to predict and foresee. The RICOWAS project will be in a very unique position to monitor the CRRP systems' performance in the different climate zones of West Africa, through yield comparison studies and economic evaluations between CRRP/SRI and conventional rice fields. Based on these circumstances, the following cost-effectiveness analysis will concentrate on the System of Rice Intensification, based on results obtained from the implementation of SRI in West Africa. Additional benefits and externalities, which might be substantial, are at this stage not quantitatively included.

COST-EFFECTIVENESS STUDY FOR TWO ALTERNATIVES

The cost-effectiveness analysis will compare two alternatives i) rice cultivation in West Africa without RICOWAS, represented by the currently implemented conventional rice production practices (called Conventional or CONV in this analysis), and ii) the scaling-up of CRRP in West Africa with the RICOWAS project (called SRI).

It is undertaken at two levels:

- Rice plot level or household level: Cost/benefit analysis of CRRP and conventional methods at rice plot level for individual farmers
- National and regional level: Aggregation of expected RICOWAS project benefits at national and regional level.

> Rice plot comparison analysis

Production costs, return and benefit of the SRI method compared to conventional method at rice plot level are based on the detailed input costs and labor costs per hectare, paddy rice yield (kg/ha), revenue from the plot (yield x price) and the benefit from the plot (revenue – costs). Data was provided during the full proposal project preparation phase by the National Executing Entities. Results of analysis from the different countries are presented in table 1.

Table 1: Production costs, return and benefit of rice production when using the SRI method and when using the conventional method at the rice plot level.

	Paddy yield	Price paddy	Input cost	Labor cost	Total cost	Revenue (yield x price)	Benefit (revenue-cost)
	kg/ha	US$/kg	US$/ha	US$/ha	**US$/ha**	**US$/ha**	**US$/ha**
SRI Costing							
Benin	6,000	0.27	582	482	**1,064**	**1,642**	**578**
Burkina Faso	7,500	0.32	572	395	**967**	**2,395**	**1,428**
Côte d'Ivoire	7,000	0.29	558	365	**923**	**2,044**	**1,120**
Ghana	6,460	0.26	503	341	**844**	**1,674**	**829**
Guinea	5,500	0.40	989	600	**1,588**	**2,198**	**610**
Mali	7,000	0.31	394	589	**984**	**2,172**	**1,188**
Niger	6,500	0.33	155	511	**666**	**2,135**	**1,469**
Nigeria	5,000	0.42	303	682	**986**	**2,100**	**1,114**
Senegal	5,000	0.27	222	151	**373**	**1,369**	**996**
Sierra Leone	3,500	0.59	202	631	**833**	**2,054**	**1,221**
Togo	4,800	0.26	157	391	**548**	**1,226**	**678**
Average	**5,842**	**0.34**	**422**	**467**	**889**	**1,910**	**1,021**
Conventional Costing							
Benin	3,000	0.27	214	391	**605**	**821**	**216**
Burkina Faso	5,500	0.32	653	340	**993**	**1,756**	**763**
Côte d'Ivoire	4,000	0.29	150	349	**499**	**1,168**	**669**
Ghana	3,760	0.26	206	341	**547**	**974**	**427**
Guinea	2,500	0.40	272	400	**672**	**999**	**328**
Mali	5,000	0.31	542	523	**1,065**	**1,551**	**486**
Niger	5,000	0.33	347	493	**839**	**1,642**	**803**
Nigeria	4,000	0.42	350	471	**822**	**1,680**	**858**
Senegal	3,000	0.27	366	115	**481**	**821**	**340**
Sierra Leone	2,200	0.59	350	481	**831**	**1,291**	**460**
Togo	3,300	0.26	181	272	**453**	**843**	**391**
Average	**3,751**	**0.34**	**330**	**380**	**710**	**1,232**	**522**

The results presented stem from irrigated and rainfed lowland rice production systems in the different countries, which can explain some of the differences in yield level. Rice yields under SRI fluctuated between 3,500 and 7,500 kg/ha with an overall average of 5,842 kg/ha, whereas in conventional rice farming, yields varied between 2,200 and 5,500 kg/ha with an average of 3,751 kg/ha. SRI yields were therefore 56% higher compared to conventional methods, which are highly similar results to the SRI-WAAPP project findings (Styger and Traoré, 2018).

The production costs are divided into input costs and labor costs. Input costs for SRI were lower in 6 countries and higher in 5 countries compared to conventional production. The higher input costs under SRI can be primarily be attributed to the high cost of organic fertilizer in these countries. The use of organic fertilizer is not common in rice production, and access to sufficient quantity or the price of the organic fertilizer can be a problem. Producing cost-efficient organic matter to be used as organic fertilization will be a focus of the RICOWAS project. All other inputs costs were significantly reduced with SRI. Farmers used 90% less seed and only 50% of the chemical fertilizers in most countries compared to the conventional systems. Often farmers omitted the use of pesticides entirely with SRI. Thus, input costs were reduced with SRI by one third (compared to conventional methods) in the countries where organic matter was more affordable and better available.

Labor costs are about 20% higher with SRI compared to conventional farming. These higher costs are related to good soil preparation (with a focus of field levelling), transplanting and weeding where mechanical weeders were not available. In countries where mechanical weeders are used, labor use was reduced compared to manual weeding in conventional plot. It did not always compete where farmers combine herbicide use with manual weeding. Nursery management, uprooting time and transporting of seedlings was significantly reduced with the SRI system. Time of harvesting and threshing naturally increased with SRI based on higher yields.

Total production costs per hectare increased overall by 25% with SRI and was 889 USD/ha compared to 710 USD/ha with conventional methods, thus 179 USD/ha higher with SRI.

Revenue of the production was calculated by multiplying the yields with the average paddy price farmers receive in their respective countries. Looking at the average across all countries, farmers' revenue with 1 ha of SRI rice is 1,910 USD, whereas for the conventional plot it is 1,231 USD, indicating a difference of 678 USD/ha.

Benefit from rice production was calculated by subtracting the total costs from the revenue, which is shown in table 2. With SRI, the benefit a farmer makes is 1,021 USD from one hectare of land, whereas under conventional farming it is 522 USD, thus almost half. This indicates that a farmer gains 499 USD per hectare in addition to what he/she earns when cultivating

a conventional rice plot. Again, this is congruent with multiple cost-benefit analyses undertaken in West Africa and around the world by comparing the SRI income with conventional rice farming income (SRI Research Database, online).

Table 2: Comparison of benefits (USD/ha) obtained by using SRI method and conventional method of growing rice

	Benefit (revenue-cost) US$/ha	Benefit (revenue-cost) US$/ha	Additional benefit SRI compared to Conv US$/ha
	SRI	**Conventional**	**SRI - Conv**
Benin	578	216	**362**
Burkina Faso	1,428	763	**665**
Côte d'Ivoire	1,120	669	**452**
Ghana	829	427	**402**
Guinea	610	328	**282**
Mali	1,188	486	**702**
Niger	1,469	803	**666**
Nigeria	1,114	858	**256**
Senegal	996	340	**656**
Sierra Leone	1,221	460	**761**
Togo	678	391	**287**
Average all countries	**1,021**	**522**	**499**

The main conclusion from this analysis relates to the feasibility for farmers to undertake SRI, as the production costs can be slightly higher with SRI. Although farmers across the region are on board with SRI, they might not have sufficient resources at hand to grow SRI rice on 100% of their land. Farmers often use SRI on a section of their land, based on their means. In order to support the scaling-up of climate-resilient rice production and SRI, it is therefore critical for farmers to be able to access cost-saving techniques and labor-saving equipment, both of which is a focus of RICOWAS. It will allow farmers to fully embrace SRI and with that increase their wealth from rice production, while at the same time protect the environment and adapt to climate change.

> **Additional benefits for smallholder farmers created when adopting SRI/CRRP at the national and regional level**

The calculations of additional benefits obtained with SRI/CRRP at the national and regional level are shown in table 3. These are based on the target number of beneficiaries (row 1 in table 3) and hectares to be cultivated with CRRP methods (row 2) under the RICOWAS project. Although additional benefits/ha when using the SRI method compared to the conventional method were calculated at 499 USD/ha (see table 2), this number was reduced by 40% to 300 USD/ha for purpose of aggregation and taking into account risks and uncertainties. Further assumptions were made that in the first year of project implementation 10% of target rice area of the final target area will be planted with CRRP (row 7), in the second year that will increase to 25% (row 6), in the third year to 70% (row 5) and eventually reach 100% in year four (row 4). As these benefits occur on an annual basis, these total additional benefits were added up for the four years of the project (row 8). The total additional benefits that farmers will earn from implementing CRRP will reach by the end of the project 43.8 million USD (row 8), or 352 USD/farmer beneficiary (row 9).

> **Additional value of rice produced**

What will be the total value be of the additional rice produced at the project sites over the course of the project period? Based on the total rice area of 71,240 hectares under CRRP by the end of the project, calculations were made to estimate the additional rice produced by CRRP compared to current conventional rice farming (Table 4). The values for the yield differences between SRI and conventional rice farming for the rainfed systems and the irrigated systems were adopted from the final project results report of the SRI-WAAPP Project (Styger and Traoré, 2018). They are reported for each country in the table below. On average for all 13 countries, the yield differences between SRI and conventional rice farming for irrigated rice is 2.32 t/ha, and for rainfed rice 2,18 t/ha, respectively. Total additional rice produced by the end of the project is therefore estimated to amount to 358,650 tons of paddy rice, or 229,536 tons of milled rice with a total value of 114.77 million USD. The benefits will continue to accrue every year onward and are expected to proportionally increase as more farmers will adopt CRRP in West Africa, and therefore contribute to the regional Rice Offensive towards rice self-sufficiency.

> **Expected generated benefits by the project (Alternative 2) in comparison to no-project intervention (Alternative 1)**

An evaluation of expected generated benefits by the project (Alternative 2) was undertaken and compared with the absence of the project (Alternative 1). The results for each of the project outputs are presented in table 5.

Table 3: Additional benefits (USD) produced with the CRRP method compared to the conventional method, for the 13 countries, over course of the project period.

Row number				Benin	BF	CDI	Gambia	Ghana	Guinea	Liberia	Mali	Niger	Nigeria	Senegal	SL	Togo	Total/Average
1		Number of farmers	Number	7,128	6,830	3,392	8,485	13,173	5,600	13,620	18,164	10,981	1,200	14,245	15,000	6,513	124,331
2		All rice systems, number of hectares (ha)	ha	7,061	2,142	3,199	2,122	10,176	2,200	2,741	9,403	3,241	15,000	6,213	3,000	4,742	71,240
3	Total additional benefits for 100% rice area with SRI compare to Conv =300 USD/ha (60% of 499 USD)* (Target surface area in number of ha x 300 USD/ha)		USD	2,118,300	642,600	959,700	636,600	3,052,800	660,000	822,300	2,820,900	972,300	4,500,000	1,863,900	900,000	1,422,600	21,372,000
	Project additional benefit accumulation over 4 years (with % of target area cultivated)																
4		Total Year 4 (100% of land cultivated)	USD	2,118,300	642,600	959,700	636,600	3,052,800	660,000	822,300	2,820,900	972,300	4,500,000	1,863,900	900,000	1,422,600	21,372,000
5		Total Year 3 (70% of land cultivated)	USD	1,482,810	449,820	671,790	445,620	2,136,960	462,000	575,610	1,974,630	680,610	3,150,000	1,304,730	630,000	995,820	14,960,400
6		Total Year 2 (25% of land cultivated)	USD	529,575	160,650	239,925	159,150	763,200	165,000	205,575	705,225	243,075	1,125,000	465,975	225,000	355,650	5,343,000
7		Total Year 1 (10% of land cultivated)	USD	211,830	64,260	95,970	63,660	305,280	66,000	82,230	282,090	97,230	450,000	186,390	90,000	142,260	2,137,200
8	Total additional benefits for farmers during RICOWAS project		USD	4,342,515	1,317,330	1,967,385	1,305,030	6,258,240	1,353,000	1,685,715	5,782,845	1,993,215	9,225,000	3,820,995	1,845,000	2,916,330	43,812,600
9	Total additional benefits USD for each farmer during entire RICOWAS project (total benefits/total number of farmers)		USD/farmer over 4 years	609	193	580	154	475	242	124	318	182	7,688	268	123	448	352

* Although additional benefits/ha using SRI compared to CONV were calculated at 499 USD/ha, for the purpose of aggregation of numbers, 60% of 499 USD was applied, thus 300 USD/ha.

Table 4: Additional value of rice produced over the course of the RICOWAS project period

		Benin	BF	CDI	Gambia	Ghana	Guinea	Liberia	Mali	Niger	Nigeria	Senegal	SL	Togo	Total/Average
Number of farmers		7,128	6,830	3,392	8,485	13,173	5,600	13,620	18,164	10,981	30,000	14,245	15,000	6,513	153,131
Irrigated rice production															
	Rice area, number of hectares (ha)		1,801	2,024	2,065	4,840		1,490	7,688	1,205	10,200	1,688		1,459	34,460
	Additional production t / ha for SRI compared to Conv *		2.15	0.95	2.1	2.7		*2.38*	2.47	2.33	3.37	*2.38*		*2.38*	2.32
	Irrigated rice, total additional paddy production (tons)		**3872**	**1923**	**4337**	**13068**		**3546**	**18989**	**2808**	**34374**	**4017**		**3472**	**90,407**
Rainfed rice production															
	Rice area, number of hectares (ha)	7,061	341	1,175	57	5,336	1,900	1,251	1,715	2,036	4,800	4,525	3,000	3,283	36,480
	Additional production t / ha for SRI compared to Conv *	2.26	1.53	*2.18*	*2.18*	2.66	2.21	3.04	1.7	0.94	2.42	2.75	2.52	1.96	2.18
	Rainfed rice, total additional paddy production (tons)	**15958**	**522**	**2562**	**124**	**14194**	**4199**	**3803**	**2916**	**1914**	**11616**	**12444**	**7560**	**6435**	**84,245**
Mangrove rice production															
	Mangrove system, number of hectares (ha)						300								300
	Additional production t / ha for SRI compared to Conv *						1								1
	Mangrove system, total additional paddy production (tons)						**300**								**300**
All rice systems															
	All rice systems, number of hectares (ha)	**7,061**	**2,142**	**3,199**	**2,122**	**10,176**	**2,200**	**2,741**	**9,403**	**3,241**	**15,000**	**6,213**	**3,000**	**4,742**	**71,240**
	All rice systems, total additional paddy production (tons)	**15,958**	**4,394**	**4,484**	**4,461**	**27,262**	**4,499**	**7,349**	**21,905**	**4,721**	**45,990**	**16,461**	**7,560**	**9,907**	174,951
Total additional rice produced with RICOWAS (tons)															
	Total Year 4 (100%)	15,958	4,394	4,484	4,461	27,262	4,499	7,349	21,905	4,721	45,990	16,461	7,560	9,907	**174,951**
	Total Year 3 (70%)	11,171	3,076	3,139	3,123	19,083	3,149	5,144	15,333	3,305	32,193	11,523	5,292	6,935	**122,466**
	Total Year 2 (25%)	3,989	1,098	1,121	1,115	6,815	1,125	1,837	5,476	1,180	11,498	4,115	1,890	2,477	**43,738**
	Total Year 1 (10%)	1,596	439	448	446	2,726	450	735	2,190	472	4,599	1,646	756	991	**17,495**
Total additional paddy rice produced (4 years) in tons		**32,714**	**9,007**	**9,193**	**9,145**	**55,887**	**9,223**	**15,066**	**44,905**	**9,679**	**94,280**	**33,745**	**15,498**	**20,310**	**358,650**
Total additional milled rice produced (64% of paddy)		**20,937**	**5,765**	**5,883**	**5,853**	**35,767**	**5,903**	**9,642**	**28,739**	**6,195**	**60,339**	**21,597**	**9,919**	**12,998**	**229,536**
Value of additional milled rice produced (USD) (500 USD/ton)		**10,468,356**	**2,882,385**	**2,941,701**	**2,926,259**	**17,883,715**	**2,951,344**	**4,821,101**	**14,369,588**	**3,097,297**	**30,169,440**	**10,798,541**	**4,959,360**	**6,499,058**	**114,768,145**

* * SRI WAAPP Final project results (n=292)

Italic *estimated based on regional average*

Table 5: Comparison between benefits created by the project (Alternative 2) and no-project intervention (Alternative 1)

Project outputs	Cost US$	Benefits generated	Alternatives to project
COMPONENT 1: Strengthen human and institutional capacity in climate-resilient rice production (CRRP)			
Outcome 1.1. Climate change dimension in the regional Rice Offensive Strategy and the National Rice Development Strategies integrated			
Output 1.1.1. Climate change dimension and proposed actions integrated into the regional and national rice strategy documents	300,000	The project through the studies and policy dialogue will contribute to strengthen the knowledge on climate change impact in the ECOWAS region for the benefit of all stakeholders. Up to date, knowledge on climate change adaptation for rice production is still limited in the region. All the results will be available at national and regional levels.	The assessment is an important vehicle through which farmers, researchers, decision-makers and extension services are able to learn about climate change and how to adapt to it. Without this scientific basis, it will be difficult to convince the stakeholders to adopt and focus on new rice growing methodologies that are based on SRI, SLWM and IPM
Outcome 1.2. Key stakeholders operating in different climate zones and rice systems gained tools, knowledge and skills to successfully address climate-threats &implement CRRP in a sustainable way			
Output 1.2.1. Capacity of national and regional research centers strengthened	322,000	The project will strengthen the capacity of 14 research institutions (13 national and 1 regional) support field-oriented research on climate adaption, and support the production of scientific papers. It is essential to undertake adapted and field-based research on CRRP practices, in order to provide clear and scientific guidance for their adoption.	Not undertaking research on CRRP practices will weaken their potential acceptance and dissemination. The methods might not be well understood and thus not given the credit and evaluation they might deserve.
Output 1.2.2. Institutional capacity of the regional and national executing entities for project implementation strengthened	461,500	The capacity strengthening of the 13 NEE and 1 REE are essential to enable them to ensure their role in the coordination of activities. This is especially important, as the project brings together researchers, extension service, producers, private sector and decision-makers.	Without this support, the NEE and REE will find it very difficult to efficiently coordinate the project activities and be inclusive to all actors of rice value-chain.
Output 1.2.3. Extension institutions involved in the development and dissemination of SRI and CRRP strengthened	565,000	The project will work with research institutes, ministries and other stakeholders to develop a training curriculum. Extension service staff will receive in-depth training on CRRP and be equipped with training materials. They in turn will train around 124,331 in climate resilient rice production	Without the upscaling of the SRI/CRRP approach, farmers will continue with inefficient, input-based and non-sustainable practices leading to soil degradation, water overuse, chemical pollution, resulting in a rice production system that is highly vulnerable to climate change, leading to yield decline, crop failure and a decline in food security.
COMPONENT 2. Assist farmers to scale-up Climate-Resilient Rice Production CRRP			
Outcome 2.1. Smallholder rice farmers in the project zones successfully adopted SRI and CRRP practices, achieved higher rice productivity, and improved their incomes and livelihoods.			
Output 2.1.1. Smallholder rice farmers in the project zones strengthened their livelihoods by reducing production costs and improving rice yields through the adoption of SRI and CRRP	6,383,000	The project will support 124,331 farmers across the region in training and technical assistance to implement CRRP practices on 56,740 ha that creates on average an additional income of income of 282 USD per ha and farmer over the 4 years of project (total of approximatively 35.1 million dollars of additional income to farmers)	Without changing towards CRRP practices, farmers will continue to experience yield fluctuations and continuous yield reductions, while having insufficient capacity to adapt to climate change threats and calamities, which will lead to reduced food security and increased poverty.
Output 2.1.2. SRI and CRRP practices - adopted by smallholders in the project zones - monitored, analyzed and the results widely shared	815,000	A well thought out monitoring and evaluation system will support the project life cycle, institutionalize a culture of accountability, and promote good governance and management, all of which can inform and provide support to other programs in the countries and region to implement results-oriented CRRP actions.	Without a robust M&E system, the project will neither be able to document field results and lessons learned, nor adjust training modules for rice producers. This relates not only for internal use but also for public dissemination of findings and information. The project would not be able to respond to the information needs of OSS, the Adaptation Fund, and the governments in relation to the implementation of project activities, outputs, outcomes and impact of the project.
Outcome 2.2. Rice value chain strengthened through public-private partnerships (PPP) and agricultural associations and cooperatives, and thus improved the resilience of smallholder rice farmers to the harmful effects of climate change			
Output 2.2.1. Rice production and post-harvest components in the rice value-chain strengthened	1,035,000	The project will facilitate the establishments of PPP, which will remain active beyond the project's life cycle and which will continuously create added value for all parties as time goes on.	If the current situation prevails, rice farmers would not have the opportunity to benefit from economic activities along the rice value chain activities and thus not be able to increase their income significantly and with that improve their livelihoods.
Output 2.2.2. Agricultural associations and cooperatives in the rice value chain strengthened in their operations	887,500	The project will increase the capacity of producer organizations to become active in the economic value-chain operations, especially in post-harvesting processing and marketing of the rice they produced.	Without better organization and improved capacity, farmer organizations will have difficulties to successfully implement new business models of post-harvest processing and marketing. They will also have difficulties to access credits and financing, thus are not able to diversity

			their income streams and improve their livelihoods.
COMPONENT 3. Strengthen communication, advocacy and partnerships to scale-up CRRP			
Outcome 3.1. Awareness and knowledge of CRRP in West Africa greatly increased			
Output 3.1.1. Knowledge and awareness materials developed and widely disseminated, in response to the demand and needs of different stakeholder groups	515,000	Sharing information and knowledge gained on CRRP will allow the wide range of stakeholders to embrace, promote and drive the scaling-up of CRRP, and thus contribute significantly to the goals stated in the national and regional rice policies.	If knowledge is not shared, viable climate adaptation strategies and practices will not be known to stakeholders. Behavioral change in rice cultivation is not happening and rice systems remain highly vulnerable to climate change impact
Outcome 3.2. Partnerships and coordination strengthened to enable the mainstreaming of CRRP in West Africa.			
Output 3.2.1. Synergies among partners established to mainstream CRRP in West Africa	515,000	Creating an effective coalition of partners will guarantee that CRRP will be mainstreamed and scaled-up beyond the project's lifetime.	Interventions remain fragmented, limited to short-term gains and do not gain momentum to effectively contribute to climate-adaptation solutions
Total	11 799,000		

> **Advantage of the regional approach**

> A regional approach will be the most cost-effective way to quickly create a long-lasting and significant impact for West African rice farmers as they adapt to climate change while increasing rice productivity. The groundwork has already been laid through the SRI-WAAPP, which established institutional support in all 13 countries and developed a regional community of practice for SRI. The partners' commitment to regional scaling-up of SRI and CRRP with the RICOWAS project was quickly confirmed throughout the project preparation process (Pre-Concept Note, Concept Note and Full Proposal Development by taking a regional approach, costs on many levels can be reduced. RICOWAS will work with a single operational framework in 13 countries. The project will develop a harmonized technical CRRP approach for the entire region, design common training approaches, stimulate regional research and invite a policy dialogue across the region. A common understanding and language of CRRP can be developed, which will catalyze the implementation of CRRP in the region. RICOWAS is not a pilot-project but a scaling-up project, thus developing a regional 'community-of-practice' is important, and momentum gained at the regional level will help in the scaling-up process and in reaching the next level of mainstreaming CRRP in the region. Implementing the project in 13 separate national programs would be much more expensive. But more than that, developed innovations would not be easily shared with other countries and scaling-up process would be considerably slowed down, and scaling-up opportunities not seized. This would have very large financial implications as the farming communities would not be able to efficiently adapt to climate change. A regional approach will also directly strengthen the implementation of the "Rice Offensive" initiative that targets rice self-sufficiency for West Africa by 2025, a major program of the ECOWAS' Regional Agricultural Policy for West Africa (ECOWAP)

> **Financial analysis**

Financial analysis for the cost-effectiveness of the project is shown in table 6. The financial profitability of the project investment is determined by the cost components of the project and by estimating the financial benefits obtained through project interventions based on the following financial appraisal techniques: i) cash flow ii) benefits cost ratio, iii) net present value (NPV), and iv) internal rate of return (IRR).

Table 6: Financial analysis for the cost-effectiveness of the project

	Year 1	Year 2	Year 3	Year 4	Total
A. Cost components					
Component 1	$ 469 000,00	$ 587 500,00	$ 417 000,00	$ 175 000,00	$ 1 648 500,00
Component 2	$ 2 180 750,00	$ 2 348 250,00	$ 2 504 750,00	$ 2 086 750,00	$ 9 120 500,00
Component 3	$ 297 000,00	$ 285 000,00	$ 224 000,00	$ 224 000,00	$ 1 030 000,00
Execution costs (management units)	$ 280 226,25	$ 280 226,25	$ 280 226,25	$ 280 226,25	$ 1 120 905,00
Implementation costs (management unit)	$ 270 023,75	$ 270 023,75	$ 270 023,75	$ 270 023,75	$ 1 080 095,00
Total costs (A)	$ 3 497 000,00	$ 3 771 000,00	$ 3 696 000,00	$ 3 036 000,00	$ 14 000 000,00
B. Financial benefits					
Benefits from studies/consultancies	300 000	250 000	100 000	50 000	700 000
Benefits to trainers and extension services	400 000	600 000	200 000	194 000	1 394 000
Benefits to rice production farmers	2 339 003	5 924 800	15 799 465	19 749 332	43 812 600
Benefits to researchers	30 000	75 000	150 000	100 000	355 000
Benefits to the producer associations/groups	200 000	375 000	600 000	1 000 000	2 175 000
Total financial benefits (B)	3 269 003	7 224 800	16 849 465	21 093 332	48 436 600
Cash flow (B-A)	-227 997	3 453 800	13 153 465	18 057 332	34 436 600
Benefit Cost Ratio (B/A)	0,9	1,9	4,6	6,9	3,5
Net Present Value (NPV)					8 382 069
Internal Rate of Return (IRR)					30,49

The financial analysis indicates a positive benefit cost ratio of 3.5. The NPV is positive with 8,38 million dollars and the internal rate of return is also positive with 30.49%. An important aspect to consider is that the additional benefits from implementing CRRP will continue into the future to occur on an annual basis. The proposed project is therefore cost-effective and worth the investment.

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Annex 5 Regional consultation workshop report

FULL PROPOSAL DEVELOPMENT

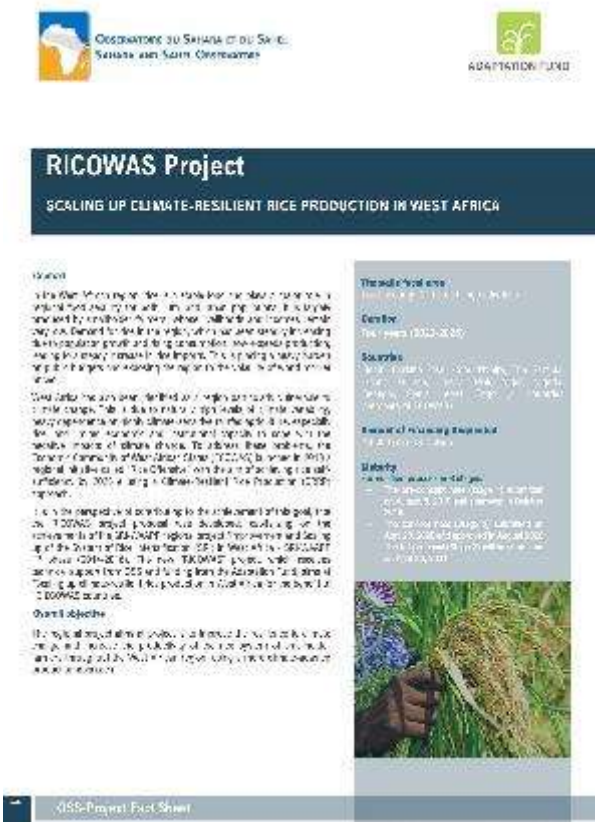
RICOWAS Project - Scaling-up climate-resilient rice production in West Africa

Report of the Regional Remote Consultation Workshop

April 15, 2021, through videoconference via Zoom

Context of the project

In the West African region, rice is a staple food and plays a major role in regional food security for both rural and urban populations. It is largely produced by smallholder farmers, whose livelihoods and incomes remain very low. Demand for rice in the region, which has been steadily increasing now exceeds production, leading to a steady increase in rice imports. This is placing a heavy burden on public budgets and exposing the region to the volatility of world market prices. West Africa has also been identified as a region particularly vulnerable to climate change. To address these problems, the Economic Community of West African States (ECOWAS) launched in 2013 a regional initiative called "Rice Offensive" to achieve rice self-sufficiency by 2025.



It is in the perspective of contributing to the achievement of this goal, using a Climate-Resilient Rice Production (CRRP) approach, that the project proposal entitled "Scaling up of Climate-Resilient Rice Production in West Africa, RICOWAS1" was developed, for the benefit of 13 ECOWAS countries (Benin, Burkina Faso, Côte d'Ivoire, Gambia, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo). This project which was submitted to the Adaptation Fund (AF) received approval of the pre-conceptual and conceptual notes in October 2019 and August 2020 respectively, which allowed the process of developing the full proposal to be submitted for the AF inter-sessional review cycle to begin by April 26, 2021.The Sahara and Sahel Observatory (OSS) is the Regional Implementing Entity and the Regional Executing Entity is the ECOWAS-sponsored Regional Rice Specialization Center (RCoS-RICE), in partnership with Cornell University, USA (Climate-Resilient Farming Systems program).

The overall objective of the project is to improve the resilience to climate change and increase the productivity of the rice system of smallholder farmers throughout the West African region, using a more climate-adapted production approach. Specifically, the project aims to:

- Strengthen the resilience and capacity of small-scale rice farmers and other stakeholders in the rice sector by enabling them to use agro-ecological and sustainable land and water management strategies that respond to the threats of climate change in their respective localities
- Support farmers to implement and improve CRRP, using the System of Rice Intensification (SRI) method and locally adapted soil and water conservation management approaches
- Support a communication platform and engage in advocacy to promote the effective exchange of knowledge and expertise among various stakeholders in West Africa and elsewhere
- Facilitate the creation of a coalition of partners at the national and regional levels for the improvement of CRRP.

In order to achieve these specific objectives, the RICOWAS project will be structured around three main components:

- Component 1: Building human and institutional capacity for climate-resilient rice production (CRRP)
- Component 2: Supporting farmers to scale up the CRRP
- Component 3: Strengthen partnerships, communication and advocacy for the scaling up of CRRP.

The project will build on existing human and institutional capacities and on the achievements of the SRI-WAAPP regional project "Improvement and Scaling up of the System of Rice Intensification (SRI) in West Africa - SRI-WAAPP 1st phase (2014-2016)". SRI-WAAPP was coordinated by the National Center for Rice Specialization (NCoS -RICE/IER/Mali), with the supervision of the West and Central African Council for Agricultural Research and Development (CORAF) and under the institutional umbrella of ECOWAS.

It is therefore within the framework of its mission to accompany the formulation of projects with the Adaptation Fund, that OSS through a participatory and consultative approach organized a workshop aiming at the appropriation of the RICOWAS project content and areas of involvement by all stakeholders, in partnership with the regional implementing entity (RCoS-RICE). In the context of the pandemic, this workshop was held remotely via the "Zoom" videoconference platform on Thursday, April 15, 2021.

Workshop objectives and expected results

Objectives

The general objective of the regional consultation workshop was to gather the expectations and needs of all participants, but also to clarify several relevant points, thus enabling the consultant to integrate the proposals and recommendations resulting from the discussions on the project document to be submitted to the Adaptation Fund. The workshop was also an opportunity to inform participants about the scope of the RICOWAS project, its objectives and the related risks.

The general objective of this workshop was broken down into several specific objectives as follows:

- Gather the needs and expectations expressed by the participants to take them into account in the project activities
- Validate the project's logical framework based on the components, results and outputs
- Validate the project budget allocation
- Validate the institutional arrangements - the roles and responsibilities of the different stakeholders who will be involved in the execution of the project
- Validate the identified risks of the proposed interventions and their mitigation measures
- Share the main results of the national consultation workshops.

Expected Results

The expected results of the regional consultation workshop included:

- Common understanding of the project's aspirations and the measures to be implemented to adapt to the impacts of climate change and to develop rice production in the region
- Integration of recommendations and remarks concerning the different sections of the project
- Document
- Validation of the institutional set-up necessary for the successful implementation of the project
- Validation of the budget allocation between the different components, outputs and outcomes of the Project
- Presentation of the difficulties that could slow down the project actions during its implementation
- Validation of the environmental and social risks related to the project and their classification according to the AF standards
- Validation of the environmental and social management plan, including the management of unidentified sub-projects and the complaint resolution mechanism; and
- Validation of the gender action plan.

Methodology

The regional consultation workshop was an opportunity to bring together the RICOWAS thirteen (13) countries, their regional partners, as well as several other categories of stakeholders, in order to establish a common reflection around the project. The agenda was alternated between thematic presentations related to the project followed by exchanges, discussions and questions from the participants. Most of the presentations were made by the team of consultants in charge of the preparation of the project document, and a lot of time for participant feedback was provided to gather many different viewpoints. Validation of project preparation documents taking into account all shared inputs was part of the final section of the workshop.

Participants

The participants in the regional remote consultation workshop were as follows:

- The national directors and facilitators of the National Executing Entities from the 13 ECOWAS countries, and the regional facilitator
- The representatives of the Regional Execution Entity (RCoS-RICE)
- The representatives of the Regional Implementing Entity (OSS)
- The representatives of West African inter-governmental organizations (ECOWAS, CILSS, UEMOA)
- The representatives of regional research and development organizations (CORAF, AfricaRice)
- The representatives of rice farmer associations
- The representatives of NGOs implementing SRI
- The representatives of rice processing and marketing
- The consultant team in charge of the drafting of the full proposal document for the RICOWAS project to be submitted to the Adaptation Fund.
- Gender specialist of CORAF
- Other resource persons such as researchers, students, etc.

A total of 68 participants registered and 50 (of which 22 % were women) attended the regional consultation workshop. The list of participants can be found in Appendix 1.

Working Documents

Several project related documents were made available to workshop participants:

- Draft of the full project document
- Logical framework and results framework
- Results and conclusions of the stakeholder consultations in the 13 countries
- Draft Environmental and Social Management Plan
- Draft of project-specific complaint management mechanism
- Draft Gender Action Plan

Workshop Workflow

The workshop took place on April 15, 2021 from 12:00-16:00 GMT and consisted of four (05) sessions, with an introductory and a closing session.
The whole workshop is available through the following link:
https://www.facebook.com/OSSCommunity/videos/141701884499969.

> Agenda of the regional consultation workshop

Appendix 2 - April 15, 2021 (Videoconference via Zoom) - 12:00 – 15:00 GMT

> Workshop opening

The opening session was animated by Mrs. Khaoula Jaoui, Climate Department Coordinator of OSS, on behalf of OSS. After the self-introduction of each participant (see list in Appendix 1), she presented the draft workshop agenda which was adopted with no changes.

Two opening remarks were made. The first one by Dr. Abdoulaye Hamadoun, the Director General of the Institute of Rural Economy (IER), Mali, followed by Mr. Nabil Ben Khatra, Executive Secretary of OSS. They welcomed the participants in the context of COVID 19. They addressed their words of thanks to the Adaptation fund for its financial support to the development of the concept note and the full project proposal for the RICOWAS project. Key issues that stood out from both remarks included: i) The importance of rice in West Africa and the appropriateness of RICOWAS' regional approach, ii) Threats imposed by climate change, especially with the predicted negative impacts on rice yield in the region, iii) the relevance of the RICOWAS Climate-Resilient Rice Production (CRRP) approach, a promising approach to increase rice productivity on a sustainable basis and with increased benefits, iv) the importance of the undertaken consultation process during project preparation with the representatives of all stakeholder categories at multiple levels (local to international) and the inclusiveness of stakeholder diversity, and v) the ownership of the project by the countries. Both wished success for the workshop.

This session ended by an online group photo.

> Session 1: Presentation of the Project Development Process

In the first session, Mr. Steve Muhanji from OSS gave a brief overview and introduction of OSS and the Adaptation Fund, and he also presented the timeline of the RICOWAS project development process, from the pre-concept note to the concept note to the full proposal development stage with the different milestones. There were no questions.

> Session 2: Presentation of the project full proposal by consultant

> Moderator: OSS: Mr. Steve Muhanji

The second session was devoted to the presentation of the full proposal draft, which was done by Dr. Erika Styger, lead consultant of the project preparation consultant team.

Dr. Erika started to thank all those who contributed to this document, particularly the facilitators (national entities and regional).

In her brief introduction, Dr. Erika mentioned that the full draft document was shared with the national entities and national facilitators ahead of the workshop.

The presentation was structured as follows: i) a quick introduction about project rationale and a short history of how this project came about, ii) proposal document overview, presenting the different sections that are part of the proposal, iii) In-depth explanation of the three project components, including outcomes, outputs and main activities, iv) the project budget at outcome and output level, iii) summary project zone characteristics and targets by country and summarized at the regional level, iv) the four rice systems included in project interventions zones for each country, v) identification of innovative approaches used by the project, vi) and the environmental, economic and social benefits the project is expected to create.

Questions and comments:

- Many of the comments by the participants acknowledged i) the good work is done by the proposal preparation team, ii) that country contributions and inputs were well taken into account and presented, iii) that the project is designed in a simple, pertinent and straightforward way, iv) that the indicators were good and realistic, and especially v) that the consultation process throughout the preparation phase was inclusive, participatory and satisfactory from their point of view.
- Question was asked how the project plans to integrate CRRP into the Rice Offensive Initiative
- Comment: there are serious concerns about food security in the region, marketing channels are often not working, thus RICOWAS is welcome by integrating a value-chain approach.
- CILSS representative, Dr Huber N'jafa from the executive Secretariat of CILSS, informs about an ongoing regional project on irrigation called Regional Support Project for the Sahel Irrigation Initiative (PARIIS), implemented by CILSS in the six countries: Burkina Faso, Chad, Mali, Mauritania, Niger and Senegal. Four countries being part of RICOWAS. Dr N'djafa extended the invitation to collaborate and implement together the innovative approaches discussed.
- CORAF representative, Dr Niéyidouba Lamien congratulates OSS, IER and all country partners for the work achieved. He passed on two messages from the Executive Director of CORAF: i) CORAF supports and congratulates RICOWAS' initiative to work through the CRS-RIZ, and ii) calls for coalition and partnership building and assures of CORAF's commitment and interest in this process and to collaborate with the very timely and important RICOWAS project.
- Questions came up regarding country budgeting and the flexibility for adjustments as the project is getting underway, especially in being able to respond to different country conditions. Countries accepted slight logical budget rearrangements by OSS in order to prepare an overall harmonized project.

> Session 3: Institutional arrangements and partnership

> Moderator: OSS: Mrs. Khaoula Jaoui

Two presentations were made by Dr. Karim Traoré, the RCoS-RICE coordinator, introducing the RCoS-RICE Center, and by Mrs. Khaoula Jaoui, explaining the projects' institutional arrangements and the roles of each partner.
Dr. Karim explained the governing principles of the 9 ECOWAS sponsored specialization centers. He explained the process of institutional transiting from national to the regional center and in a third step to advance to the Center of Excellence. He also shared the RCoS-RICE organizational and functioning charter. He ended his presentation by showing a few advantages for RICOWAS such as a regional multimedia center, competent regional research teams, and SRI adapted equipment.
Mrs Khaoula explained the institutional arrangements: roles and responsibilities of entities at different levels (RIE, REE, NEE) and the links between them; regional steering committee with its composition.
The partnership between NCoS-RICE and AfricaRice was discussed and clarified since it will be a member of the regional steering committee.

> Session 4: Presentation of the consultation process and the preparatory studies

> Moderator: RCoS-RICE: Dr. Karim Traoré

Four presentations were part of this section done by the consultant team and OSS.

1) Consultation process of project preparation by Dr. Erika Styger

An overview was provided of how the consultation process was initiated since the pre-concept note stage, further advanced during the project concept note and how it was implemented during the full proposal stage. At the national level, the national facilitators were leading the proposal preparation. There were three distinct national preparation stages

> Document review and information gathering (including project zone description, vulnerability and gender assessment, identification of stakeholders, on-going projects, log frame review and national budgeting

> Consultation process with rice-producing communities at the project zone level, with stakeholder identification, project zone selection, ethnic group inventory and vulnerability assessment. A survey was undertaken with key stakeholders, resulting in 728 interviews across the region.

> National validation workshops were successfully completed in all 13 countries, with 6 workshops held online and 7 in person. The number of total participants were 348 stakeholders (of which 22% were women).

The on-going regional workshop resumes the process of consultation.

2) Draft Environmental and Social Management Plan (ESMP) and grievance mechanism by Dr Yafong Berthé

Starting with the rationale of the study, Dr. Berthé continue to cover five parts of the study: I) the methodology applied, ii) the main findings of the study, iii) the main risks of the project regarding environmental and social parameters, iv) the main mitigation measures proposed, and v) the RICOWAS grievance mechanism.

When screening the three project components: i) Component 1: Strengthen human and institutional capacity in CRRP, ii) Component 2: Assist farmers to scale-up CRRP, and iii) Component 3: Strengthen communication, advocacy and partnerships to scale-up CRRP, it was found that Component 1 and 3 qualify for Category C, with no major environmental and social risks. Component 2, on the other hand, and where most field activities are executed, was classified for the B category, with potential environmental and social risks. Mitigation measures to address those potential risks are integrated into the ESMP.

Complaint reception mechanism and addresses were provided at the national level for each of the countries, as well as at the sub-regional, regional and international levels.

3) Gender Assessment and Gender Action Plan by Mr. Lassana Bah

The draft of the gender assessment and action plan (GAAP) was presented covering five sections: i) the methodology, ii) the main findings, iii) gender assessment vis-a-vis the RICOWAS project, iv) common barriers to gender equity in rice production, and v) the Gender Action Plan.

In summary, gender will be mainstreamed in the three project components of RICOWAS as follows:

- Component 1: Strengthen the human and institutional capacities of women and young people in the production of climate-resilient rice
- Component 2: Support women and young rice farmers to scale up the CRRP. Encourage young non-rice farmers to join the CRRP
- Component 3: Strengthen communication, in favor of women and young people in the scaling-up of CRRP.advocacy and partnerships

4) Stakeholder engagement, participatory processes, FPIC by Mrs Khaoula Jaoui

Principally, OSS explained the importance of its role as RIE in considering indigenous peoples (IP) in projects to ensure compliance with the Adaptation Fund Environmental and Social Policy. Even though IP are not present in the RICOWAS project implementation area, OSS wanted through this presentation to focus on the process to conduct inclusive consultation with community members during project implementation, as well as the guidance OSS provides to consultants on applying Free, Prior and Informed Consent (FPIC) process during the project cycle.

No questions and comments were made during this Session.

> Session 5: Discussions

> Moderator: Dr. Erika Styger

Dr. Erika Styger, the lead consultant, moderated this session. She invited all participants to participate and to express themselves freely since this session offers the country representatives and all other participants to share their comments, concerns and recommendations. The main points from this discussion can be summarized as follows:

- CORAF has been supporting the RICOWAS process and will continue to do so. Recommendation to establish a partners' coalition for better synergies between technical and financial partners' actions.
- CILSS is available to support the next steps in the process of project development.
- CILSS informed about a regional resource that is available: *le Comité Ouest Africain d'Homologation des Pesticides* (COAHP), a regional pesticide registration system based in Bamako, working for ECOWAS, CILSS, and UEMOA. This committee can be of service to RICOWAS and assist in tracking agro-chemicals being used in the field.

- Question was raised about flexibility to adjust allocation of budget lines. OSS responded that there is some flexibility during project implementation especially between activities under the same output.
- A number of participants insisted on the importance for the project to facilitate the acquisition of adapted equipment and tools by the rice farmers which would be a significant contribution the scaling up of CRRP. The Gambia is especially interested in women-friendly equipment and tools, Senegal would like to access trans-planters and weeders that work in different soil conditions. Participants reiterate, if equipment constraints are resolved, scaling-up will happen fast.
- Participants from several countries applauded the hard work done by OSS, the consultant team, and the regional facilitator, and mentioned that their contributions have been well taken into account and that the project document reflects their contributions very well.
- Comment was made that the emphasis on PPP is welcome and important. Association of private sector can help drive the implementation of project activities.
- Additionally, the integration of various stakeholders in the project implementation is important (e.g. research and extension, value-chain actors etc.), as this will reinforce results obtained in the field.
- It was welcomed that the project will be flexible for countries to use and implement their own extension approaches, e.g. farmer field school approach.
- Value-chain emphasis is highly welcome, and it is important to unite all actors, including for production, processing, marketing, and consumers under one platform
- Countries are on board with SRI, given the good results obtained with the farmers over the past years.
- It is very important and highly welcome that RICOWAS allows countries to develop and work with better adaptation strategies to climate change for the rice sector.
- Indigenous people issue has been discussed in all the countries and has not been identified to be a problem in any of the project zones. Nevertheless, it has been stressed that it is very important to focus on quality and time taken in the consultation process with communities, so that interventions will be inclusive and respond to people's concerns, interest and abilities.
- This also included the question of land access. It come to the attention in Niger, that when farmers improve soil quality when implementing SRI, they might run into problems with the landowners, who might reclaim the improved plots for their own benefit.
- RICOWAS contribution to the NRDS should be possible (Outcome 1.1.). The national facilitator from Burkina Faso clarifies that the National Rice Development Strategies are elaborated with the support of CARD over a period of 10 years. They already take into account some aspects of climate change but there is much opportunity for reinforce this. RICOWAS can play an important role especially with the opportunity to reinforce the 3-year executing plans of the NRDS.
- Collaboration with projects working on other areas within the rice value-chain is welcome, e.g., the use of new varieties developed by AfricaRice.
- In response to including new varieties into the project, a comment was made that varieties per se do not represent a bottle neck under CRRP, as SRI improves the productivity of all varieties, be it improved or traditional varieties.
- Project baseline study: it is recommended for it to be done at the regional level for all the countries by one regional consultant to benefit the regional approach of the project.
- OSS was requested to speed up transfer of preparatory funds for full project development to the two remaining countries, which have not yet received the funds.
- Recommendation to open a bank account specifically for the RICOWAS project was provided, so that funds are very well attributed to the project activities. OSS informed that this is already in their implementation policy.
- Concerns were raised about being able to implement the project with the small budget attributed in the fixed amount of the executing costs, especially as a lot of the coordination activities are needed to implement the different project activities.

> Workshop closing

The closing session was led by Mrs Khaoula Jaoui from OSS, with some final comments by the Dr Erika Styger and Dr Gaoussou Traoré. Main points were summarized as follows:

- OSS remains open to receive further comments and feedbacks to be incorporated into the project document
- All power point presentations will be shared with the participants by the next day
- Regional institutions are welcome to share further information about regional initiatives, so they can be well taken into account in the proposal.
- OSS will send out an evaluation questionnaire to the participants for the regional workshop
- A workshop report will be done and shared with everyone
- The workshop was recorded. It is available under the OSS Facebook.
- Participants were unanimously satisfied with the workshop. Furthermore, it was mentioned that their data were well taken into account and that the project document reflects well the countries' contribution.
- The exchanges during the workshop were very open, fruitful and constructive.
- Country representatives therefore validated the draft project document
- All the project objectives and expected results of the workshop were reached.

With a word of thanks to all, Mrs Khaoula closed the workshop.

Appendix 1: List of Participants

Country	Name	Email	Phone	Organization	Job Title
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Appendix 2:

OBSERVATOIRE DU SAHARA ET DU SAHEL
SAHARA AND SAHEL OBSERVATORY

ADAPTATION FUND

RICOWAS Project

SCALING UP CLIMATE-RESILIENT RICE PRODUCTION IN WEST AFRICA

Benin, Burkina Faso, Côte d'Ivoire, The Gambia, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo

Agenda of the regional consultation workshop on the Project Full Proposal

April 15, 2021 (Videoconference via Zoom) - 12:00 – 15:00 GMT

Time (GMT)	Activity	Lead
	Workshop opening	
12h00 - 12h20	• Presentation of the participants – Climate Department Coordinator (OSS) • Presentation and adoption of the workshop agenda	OSS

	• Opening speeches by:
	  • Executive Secretary of OSS
	  • Director General of IER
		OSS
		CRS-RIZ

	Group Photo	OSS
	Session 1: Presentation of the Project development process	
12h20 - 12h35	• Reminder of the overall project development process and AF requirements	OSS
	Session 2: Presentation of the project full proposal by the consultant [Moderator: OSS: Mr. Steve Mubang]	
12h35 - 13h10	• Introduction to the Project • Presentation of the main sections of the full proposal • Presentation of the budget by Component / Activity	Consultant team
	• Q&A	All
	Session 3: Institutional arrangement and Partnership [Moderator: OSS: Mrs. Khaoula Jaziri]	
13h10 -13h30	• Brief presentation of CRS-RIZ • Institutional arrangements and roles of each partner	CRS-RIZ OSS
	• Q&A	All
	Session 4: Presentation of the preparatory studies [Moderator: CRS-RIZ: Dr. Karim Traore]	
13h30 - 14h00	• Presentation of consultation process taken place so far	Lead Consultant
	Studies Presentation: • Draft ESMP • Suggested project-level Grievance Mechanism • Draft Gender Assessment and Action Plan - GAAP	Consultant team
	• Stakeholder engagement, participatory processes, FPIC	OSS
	Session 5: Discussions [Moderator: Dr. Erika Styger]	
14h00 - 14h20	• Additional interventions & Experience sharing	All
15 min Break (notes summarizing)		
	Workshop closing	
14h35- 15h00	**Wrap-up and sharing of main results of the workshop** • Participants' reactions • Closing remarks	Lead Consultant OSS CRS-RIZ

Appendix 3: Post event survey

In order to get feedback from participants, OSS sent satisfaction survey upon the end of the regional workshop. Results can be summarized below:

Question: What were your key take away from this event?
Answers:

- It is a scaling up project. It should be well decentralized. Regional and farmer representatives should be selected
- Clarity on the presentations particularly the roles and organizational structures of the set-up.
- Better understanding of the project components and the roles of the different stakeholders.
- The actors involved in RICOWAS at the national and regional levels are experienced, the project is very relevant for each country and for the west Africa region, the efficient management of the budget requires the flexibility and the consultation of the actors at the country and regional levels
- Good consideration of the elements given by the national entities in the elaboration of the project. The quality of the presentations
- Flexibility in the budget; opening of a dedicated account with the national facilitator as signatory; need to deepen the notion of "scaling up". Is this a pilot initiative? Etc.
- The workshop allowed for a better understanding of the project's stakes and its content, particularly in terms of the institutional arrangement
- The collaboration and good communication that existed between the different participants. The commitment of the focal points in collecting data to inform the project

Question: How satisfied were you with the logistics? Score (1-5)
Answer: Average score obtained between 4 and 5

Question: Did you find Zoom a user-friendly Platform for meetings/workshops?
Answer: 100% Yes

Question: Which sessions did you find most relevant?

Answer: All workshop sessions have been assessed relevant and very relevant

Question: Any additional comments regarding the sessions or overall agenda?
Answers:

- They were very good. They will contribute to the improvement of the project
- The agenda was not bad but i was not fully on during the opening due to interruptions on my internet connectivity
- I find that the various methods or improved practices to be promoted, such as SRI, have limitations under certain conditions of application. It will be necessary to develop options or combinations of good practices that take into account the resource endowments of producers and the specificity of ecologies.
- As one speaker also pointed out, a value chain approach is needed that takes into account the requirements and implications for the market and other segments of the chain.
- The technologies to be promoted must also be subject to a feasibility study and economic and financial profitability to attract the private sector, artisans, among others.
- In my opinion, the dissemination approach that could improve the adoption of resilient technologies is to do field demonstrations on a very large scale to be closer to potential adopters.
- Keep the PPT presentation template simple, clear with content in English and French.

Annex 6 Synthesis Report of the National Consultation Workshops

FULL PROPOSAL DEVELOPMENT

RICOWAS Project - Scaling-up climate-resilient rice production in West Africa

Synthesis Report of the National Consultation Workshops

March 13 – April 14, 2021

Workshop Settings

With the goal to contribute to the achievement of rice self-sufficiency by the 2025 "Rice Offensive", initiated in 2013 by the Economic Community of West African States (ECOWAS), the countries of the region are involved in the preparation of the project proposal of the regional project entitled "Scaling up climate-resilient rice production in West Africa, RICOWAS". This project, which proposes a Climate-Resilient Rice Production (CRRP) approach, is to be submitted to the Adaptation Fund (AF) by 13 ECOWAS countries (Benin, Burkina Faso, Côte d'Ivoire, the Gambia, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo). The Sahara and Sahel Observatory (OSS) is the Regional Implementing Entity, and the ECOWAS-sponsored Regional Rice Specialization Center (CRS-RIZ/IER-Mali) is the Regional Executing Entity, operating in partnership with Cornell University, USA (Climate-Resilient Farming Systems program). With the approval of the RICOWAS pre-concept and concept notes by the AF in October 2019 and August 2020, respectively, the process of developing the detailed RICOWAS project document (full proposal), was set in motion, which is currently underway.

The overall objective of the regional RICOWAS project is to **improve climate resilience and increase rice system productivity of smallholder rice farmers across West Africa using a climate-resilient rice production approach.** More specifically, the RICOWAS project has the following specific objectives

- Strengthen the resilience and capacity of smallholder rice farmers and other rice stakeholders in the region to use agro-ecological and sustainable land and water management strategies that respond to the climate change threats in their respective localities.
- Assist farmers to implement and scale-up Climate-Resilient Rice Production (CRRP), and to participate in other economic activities of the rice-value chain.
- Support a communication platform and engage in advocacy to promote efficient exchange of knowledge and expertise among diverse stakeholder groups in West Africa and beyond.
- Facilitate the establishment of a coalition of partners at national and regional levels for the scaling-up of CRRP.

To achieve these specific objectives, the RICOWAS project is structured around three main components:

- Component 1: Strengthen human and institutional capacity in climate-resilient rice production (CRRP)
- Component 2: Support farmers to scale-up CRRP
- Component 3: Strengthen communication, advocacy and partnerships to scale-up CRRP

The 13 RICOWAS countries have undertaken important data collection and analysis activities required for the project full proposal development. To achieve this, specific guidelines and questionnaires were followed, which were made available by the OSS consultant in charge of finalizing the "full proposal" document. The final activity of the national preparation

process was the undertaking of the national validation workshops in all 13 countries, which were held between March 13 and April 14, 2021. The national workshop reports were sent by all 13 countries following the reporting guidance and support provided by the OSS (RIE) and have been summarized in this synthesis report. The national reports are available through the following shared folder: Link

Niger

Ghana

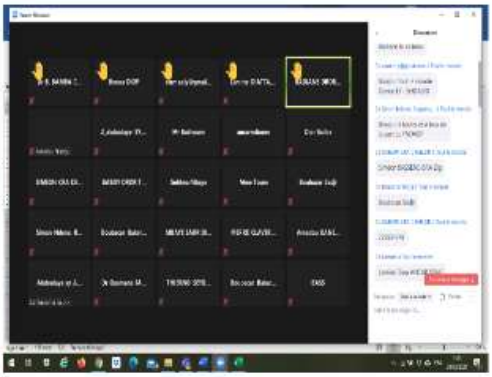
Workshop objectives

The global objective of the national consultation workshop was to i) share more detailed information about the RICOWAS project, its scope, objectives, planned activities and operational approach, as well as the preliminary outcomes from the preparation process, ii) to gather inputs about concerns, expectations, opportunities and needs from all participants, iii) to collect recommendations, which were to be reflected and included into the full project proposal document to be submitted to the Adaptation Fund, and finally iv) to validate the project preparation documents.

More specifically, the workshops were to achieve:

- Validation of project intervention sites
- Validation of community consultation surveys
- Collection and discussion of concerns and needs from the project stakeholders
- Confirmation and adjustment of the project stakeholder groups
- Discussion on effective inclusion of equity, gender and vulnerable groups into the project
- Discussion of the potential impact of project activities on the environment and social configurations at the project sites
- Discussion and validation of the project's logframe
- Validation of the institutional arrangements
- Validation of the proposed project budget

Nigeria



Senegal

Methodology

The national workshops were organized by National Executing Entities (NEE) after the completion of two previous project preparation steps, which were led by the National Facilitators (NF), and included i) document review and ii) stakeholder consultation.

I) **Document review and information gathering**: During this initial phase, the national facilitators collected the following information:

- Project zone descriptions
- Vulnerability assessment
- Cost-benefit analysis of SRI and conventional rice farming
- Stakeholder identification and mapping
- Inventory of ongoing and planned projects in the rice sector in the project zones and at the national level
- Gender assessment in regard to rice production in the project zones
- Social and environmental risk assessment of project interventions
- Log frame review
- National institutional arrangements
- Proposition of budget at activity level

II) Consultation with rice producing communities in the project zones

The consultation was implemented through local meetings and via a consultation survey with representatives of beneficiaries in the project zones. This was administered through one-by-one meetings or small gatherings at the project implementation sites. Large local meetings were not possible nor encouraged due to the COVID-19 pandemic. A total of 728 stakeholders were interviewed from 75 different project sites (see Table 1). The local language was used and specific attention to representation of vulnerable and minority groups was paid. The interactions focused on vulnerability assessment, constraints and potentials in rice production and capacity strengthening needs of the communities. The NEE also completed an inventory of all ethnic groups present in the project zones, in order to identify potential indigenous groups residing in the project zones, based on which a special consultation process is indicated to be initiated. This inventory was shared with OSS to assist in this process. The results from the surveys and the inventories were summarized in national reports, which are available at the OSS project documents website.

Table 1: Project zone stakeholders consulted and interviewed during proposal development process

Country	People interviewed	Project zones visited	Women interviewed	Part of an association	know SRI
	Number	Number	%	yes/no in %	yes/no in %
Benin	4	4	0	50	100
Burkina Faso	61	6	31	98	90
Côte d'Ivoire	81	10	4	98	70
The Gambia	69	10	59	98	75
Ghana	54	3	33	93	90
Guinea	58	6	3	38	36
Liberia	30	4	52	71	71
Mali	51	4	29	71	94
Niger	40	4	13	23	75
Nigeria	88	5	17	77	65
Senegal	103	4	41	71	80
Sierra Leone	54	10	26	83	7
Togo	35	5	17	97	89
Total/Average	728	75	25	74	72

III) **National workshops** for consultation and validation

The National Executing Entities organized the national workshops after the first two steps were completed. Particular attention was paid to an inclusive, effective and gender-balanced participation of all stakeholder groups, including rice producer organizations, agricultural research institutions, agricultural advisory services, the private sector, local communities, communicators, general directorates of the ministries, multi-lateral and bi-lateral programs and projects, as well as relevant NGOs, policy makers, financial and technical partners. Due to the restrictions imposed by COVID-19, Burkina Faso, the Gambia, Senegal and Togo organized the workshops in an online format. Nigeria organized a hybrid workshop, allowing stakeholders who were not able to travel to the meeting location to participate online. The other eight countries organized in-person workshops. A total of 348 people participated in the workshops, of which 77 were women. An overview of workshop dates, location and participants is shown in the following table.

Table 2: National Project Preparation Validation Workshops

Country	Date	Location	# Participants	% Women
Benin	3/23/21	Cotonou	25	28%
Burkina Faso	3/23/21	Online	47	21%
Côte d'Ivoire	3/30/21	Abidjan	20	16%
The Gambia	3/26/21	Online	16	6%
Ghana	3/25/21	Nyankpala	40	25%
Guinea	3/24/21	Conakry	28	29%
Liberia	4/6/21	Monrovia	20	40%
Mali	3/25/21	Bamako	21	19%
Niger	3/24/21	Niamey	27	19%
Nigeria	3/30/21	Abuja+online	37+19= 56	27%
Senegal	3/24/21	Online	33	15%
Sierra Leone	4/14/21	Freetown	15	13%
Togo	4/2/21	Online	44	11%
Total participants			348	22%

Côte d'Ivoire

Mali

Participants

Participants represented the main stakeholder groups and institutions from the rice sector and from the project sites.
The categories included: Ministry of Environment and Ministry of Agriculture, local communities, rice producer organizations, research institutions, agriculture advisory services, private sector, national and local NGOs, bilateral and multilateral programs and projects, communicators, financial and technical partners, civilian umbrella organizations (representing women and youth). The list of all the 348 participants can be found in the national workshop reports, which are posted on the OSS RICOWAS project website.

Liberia

Sierra Leone

Course of action

A common agenda was adopted and adjusted to each country's specificities. In general, the sections included:

- Prayers
- Official opening speeches
- Self-introduction of participants
- Adoption of the draft agenda
- Coffee break
- Presentation of the different proposal preparation draft documents (prepared by the NF), followed by a discussion
- Presentation of survey results followed by a discussion
- Conclusions and recommendations
- Closing remarks

Participants were provided with copies of the discussed documents, including the project concept note (to serve as background information), the project logframe, and the key results from the consultation survey. The national facilitator gave a brief presentation of each thematic section, which was followed by a discussion and the collection of recommendations to be taken into account in the country's contribution to the full document proposal. After the workshop, the national facilitators adjusted the information and data according to the national workshop's recommendations and passed the final validated country information to the regional project preparation consultant, who integrated the validated data and information into the proposal document.

Benin

The Gambia

Main Results

The main results of the workshops included:

- Validation of the project intervention sites
- Validation of results from the community consultation surveys
- Collection of concerns and needs from the project stakeholders
- Confirmation and adjustment of the project stakeholder groups
- Commitment for effective inclusion of equity, gender and vulnerable groups into the project
- Identification of issues how project activities could impact the environment and social structures at the project sites
- Validation of the project's logframe
- Validation of the institutional arrangements
- Approval of the proposed project budget

Guinea

Burkina Faso

Conclusions and recommendations

All the workshops were completed successfully with a very good attendance of a broad group of stakeholder representatives between March 13 and April 14, 2021. The 348 participants showed a high interest in the project and made many relevant and constructive contributions to the project design process of the different thematic areas presented. Each country issued various recommendations (which are all recorded in the national workshop reports). A few recommendations surfaced in several countries alike. They are summarized below.

> **Gender**

- Recommendation to pay special attention to gender (women) and youth: a good representation (in %) should be guaranteed not only for the project beneficiaries but also for stakeholders in decision-making.
- Recommendations to undertake specific actions to attract youth to participate actively in the rice sector
- Recommendations to pro-actively identify the most vulnerable groups and develop appropriate approaches for their involvement in the project activities.

> **Farmer organizations**

- The importance of working closely with farmer organizations so that the number of rice farmers benefiting from the project can be maximized
- The importance to support farmer organizations in their operations, as they can play an essential role in ensuring sustainability of project interventions beyond the project's lifetime.

> **Rice ecologies**

- Recommendations for the project to differentiate between the different rice ecologies, as constraints are not the same (e.g. droughts, floods, iron toxicity), and to make sure that interventions become adapted and highly relevant to different local conditions.

> **Mechanization**

- Recommendation for the project to focus on making labor-saving equipment available, including planting and harvesting equipment.

> **Rice value chain approach**

- Support to apply a value-chain approach for the project, but the priority should be given to the production component.

> **Baseline study**

- Recommendation to undertake a baseline study to determine existing conditions and constraints that will allow the project to strategically orient its interventions.

> **Monitoring and evaluation**

- Recommendations to allocate adequate resources for a good monitoring and evaluation of project activities

> **Risk management**

- Recommendation to undertake a good evaluation of project implementation risks and develop a plan for their mitigation.

> **Synergies**

- Recommendations for RICOWAS to work with all the rice projects in the countries to, i) encourage synergies and complementarities, ii) undertake joint activities, iii) share resources, and iv) avoid duplications of interventions so that each of the active projects can contribute an added value.

> Workshop closing

The workshops were closed with remarks by the workshop chairpersons. It was stressed that the recommendations and conclusions from the workshop should be taken into account by the national facilitators when finalizing the country contributions that are passed on to the consultant in charge of the full proposal development.

Togo

Annex 7 Summary of concerns/suggestions from the consultation processes

Summary of concerns/suggestions from the consultation processes and how they have been addressed

Concerns/Suggestions	How they have been addressed
Pay special attention to gender	All gender related issues are in the Gender Action Plan which has been validated during the video regional consultation workshop (April 15, 2021)
Undertake specific actions to attract youth to participate actively in the rice sector	Activity 2.2.1.3. Generate PPP for threshing, processing, packaging and marketing of climate-resilient rice for vulnerable groups (including youth)
Support farmer organizations in their operations	Output 2.2.2. Agricultural associations and cooperatives in the rice value chain strengthened in their operations
Differentiate between the different rice ecologies	Activity 2.1.1.2. Promote and assist farmers in executing SLWM practices in association with their SRI fields
Mechanization: focus on making labor-saving equipment available **Facilitate the acquisition of adapted equipment and tools by the rice farmer**	Activity 1.2.1.1. Support the development of SRI-CRRP adapted rice growing practices, equipment and tools Activity 2.1.1.5. Provide farmers access to equipment and tools to implement SRI-CRRP
Support value-chain approach for the project	Activity 1.1.1.5. Development and dissemination of rice sector briefs and methodologies to integrate climate change adaptation to rice value chain
Baseline study, Monitoring and evaluation, Risk management	Output 2.1.2. SRI and CRRP practices - adopted by smallholders in the project zones - monitored, analyzed and the results widely shared
Encourage synergies and avoid duplication	SECTION G proposal : Project duplication
Recommendations and conclusions from the national workshops should be taken into account	Recommendations and conclusions from the national workshops were taken into account to develop the draft document proposal. During the regional consultation workshop, countries appreciated this integration and validated the document
Integrate of CRRP into the Rice Offensive Initiative	Activity 1.1.1.3. Development of rice sector adaptation action plans for climate change to be integrated to the Rice Offensive Strategy (ROS)
Partnership between NCoS-RICE and AfricaRice	AfricaRice is positioned to be a member of the regional steering Committee in the group of « research and development organizations ». (Cf Implementation arrangements RSC)
The use of new varieties developed by AfricaRice.	SRI is a variety-neutral methodology. It improves rice productivity for all types of varieties, from traditional varieties, to high-yielding varieties to hybrid varieties. The project will collaborate with NARS and AfricaRice to promote varieties that are better adapted to climate change, especially varieties with improved drought and flood tolerance. (cf comments note CAR1)
Project baseline study: to be done at the regional level for all the countries	Activity 2.1.2.2. Implement the baseline study on rice production and value-chain characteristics
implement the project with the small budget attributed in the fixed amount of the executing costs	Activity 1.2.2.3. Acquisition of necessary logistics material to support field implementation

Annex 8 Technical note on CRRP, SRI and SLWM

Technical Note on Concrete Adaptation Measures and Best Practices for CRRP (SRI and SLWM) to be promoted and scaled-up by the RICOWAS project

1. The Climate-Resilient Rice Production (CRRP) approach by RICOWAS

The concrete adaptation actions of the RICOWAS project focus on the implementation of Climate-Resilient Rice Production (CRRP) practices with 153,131 farmers on 71,240 hectares in 13 countries of West Africa. The CRRP approach, as used in the RICOWAS project, is based on the best practices for the System of Rice Intensification (SRI) methodology in combination with location-specific Sustainable Land and Water Management (SLWM) practices, and if indicated with Integrated Pest (and disease) Management (IPM). Entry-point for the project is the scaling-up of SRI, an agro-ecological and climate-smart rice production methodology. SRI is based on optimizing ecological and biological processes to improve rice plant growth and productivity. The SRI-WAAPP project developed and adopted a conceptual and operational framework that allowed partners in all 13 countries to use a harmonized implementation approach. The conceptual framework identifies four guiding crop production principles that define the SRI methodology.

They are:

1. Encourage early and healthy plant establishment.
2. Minimize competition among plants.
3. Build up fertile soils rich with organic matter and beneficial soil biota
4. Manage water carefully to avoid both flooding and water stress

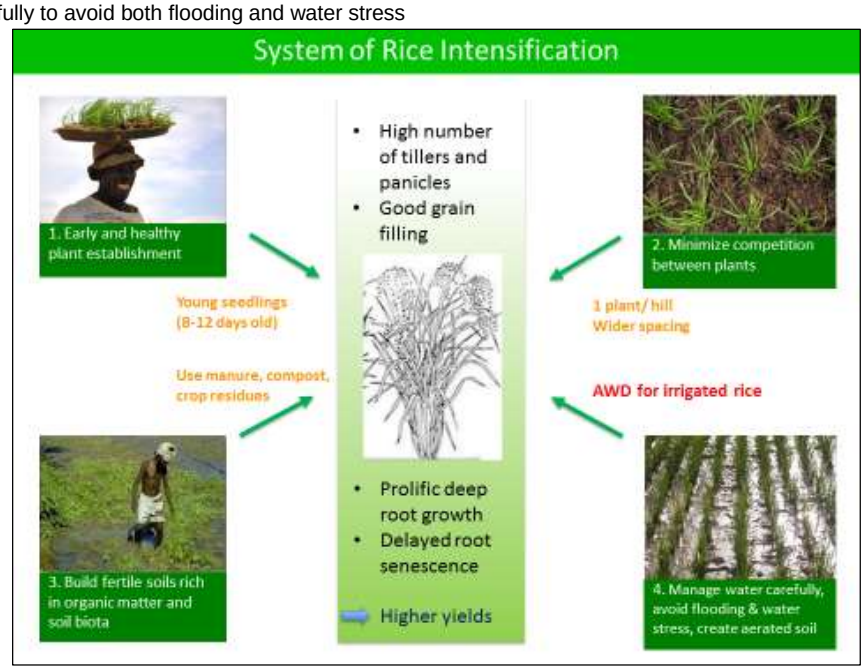


Figure 1. Principles of the System of Rice Intensification, their impact on the rice plant and some indicative practices to implement the principles.

These four principles interact synergistically and if followed, rice plants become healthier and more productive with more tillers and panicles, longer panicles carrying more and fuller seeds, and with deeper and larger roots. These ***principles remain the same*** for all rice systems and climate zones. However, the ***practices*** to implement the four principles can vary slightly depending on location and ***can be adapted to farmers' local conditions***. Best practices for different environments and systems have been developed globally and in West Africa for the past 20 years.

Differences in rice plant appearance and performance when grown with the SRI methodology compared to conventional, permanently flooded rice plantings are illustrated in the following figure.

Comparison SRI (left) vs conventional rice (right) plots planted at the same time and with same variety: SRI plants are taller, have more tillers, more biomass and grow more vigorously.

Comparison rice plant roots: SRI (right) vs conventional rice (left): SRI roots grow in aerobic soils and can grow deeper and double in volume compared to conventional rice, where roots are flooded and die back early in their development, thus are less efficient in supporting plant growth and in providing nutrients to plants.

Comparison rice plants: SRI (right) vs conventional (left): SRI plants produce more tillers (20-60 and more) compared to conventional rice (3-15), they grow more vigorously and lodge less. As each tiller can produce a panicle (grain head), SRI plants produce more panicles than conventional plants.

Comparison rice plant panicles: SRI (right) vs conventional rice (left): SRI panicles are longer than conventional panicles and carry a higher number of grains, which are fuller and of higher quality.

All these factors translate in higher rice grain yields of 20-50% and more and producing higher quality rice grains, while using 90% less seed, 30-50% less water and 30-100% less agro-chemicals

Figure 2. Comparison of appearance and performance of SRI plants and conventionally grown rice plants

Some of the rational how these principles translate into improved plant performance is explained hereby.

i) Encourage early and healthy plant establishment.

Careful and early plant establishment maximizes the plant's potential for shoot and root development, largely by minimizing early stress from both excessive competition among plants in the nursery and from transplanting. The earlier plants can be established in a rich soil, with plenty of space, the sooner they can develop roots and start tillering, and the healthier and more resilient towards stress they become. Most commonly, this translates in transplanting much younger seedlings, and if further pushed back can also include direct seeding.

ii) Minimize competition among plants.

Minimizing competition for resources—such as nutrients, water, sunlight and soil volume—helps plants grow quickly and healthy and become more productive with better panicle and grain development. This principle is highly interactive and dependent on Principle 1 and 3, early and healthy plant establishment and building fertile soils, respectively. Under SRI management, competition is minimized by reducing the density of the plant population, by both i) increased spacing between plants, and ii) planting only 1 plant/hill instead of 3-5 plants/hill.

iii) Build up fertile soils rich with organic matter and beneficial soil biota

This principle strives to create a healthy soil that supports and provides a number of functions and benefits, among others: i) a good and deep substrate for roots, and for microbial life to develop and support plant growth, ii) improve nutrient and water holding capacity of the soil, iii) improve fertilizer use efficiency, iv) create favorable aerobic soil conditions, and iv) protect and buffer against conditions created by climate change, be it variable rainfall patterns, increased temperature, pest and disease pressure. *Improving soils with organic matter is the only viable solution in the long run to create and maintain productive and healthy soils.* Integration of conservation agriculture principles and practices is highly beneficial to reach the objectives of this principle.

iv) Manage water carefully to avoid both flooding and water stress

The core point of this principle is that while rice plants can survive in flooded conditions, they don't thrive in them, as roots lack oxygen to develop comfortably. Under non-flooded and aerobic soil conditions, roots grow more proliferous and deeper (as seen in figure 2). Aerobic soil microbes support healthy plant development, and the plants tiller more and better. All this translates into better panicle development and a longer grain filling period. Aerobic soils are greatly enhanced by organic matter additions. Mineralization of nutrients found in organic matter are improved in aerobic soil conditions, making nutrients better accessible to both soil microbes and plant roots. With aerobic soil management, methane emissions —a potent greenhouse gas—from rice fields are drastically cut and arsenic uptake in rice grain is also reduced. This principle translates into different practices depending on the rice system, be it irrigated, rainfed lowland or rainfed upland rice systems. The practices are described below.

2. CRRP practices and measures tested, promoted and scaled- up by the RICOWAS project

2.1. Overview

Over the past 20 years, a large set of best practices for SRI for different rice systems and climate zones has been developed at the global level and in West Africa. The project will provide trainings, create technical manuals, and assist farmers directly in their fields to implement these best practices for SRI and to scale them up. Additionally, the project will integrate locally appropriate SLWM and IPM practices, based on identified existing best practices and based on farmers' traditional practices that both support and reinforce the resilience and adaptation capacity of the rice systems to climate change.

- The outcome will result in adopted CRRP practices by 153,131 farmers on 71,240 ha producing about 360,000 additional tons of rice (compared to conventional rice production) over the project period of 4 years. Beyond the project timeline, these results will be continuously repeated annually, and further expanded through farmer-to-farmer sharing of best practices and through the establishment and running of PPP, thus creating cumulative benefits and impacts that continue with each year after the project has ended.

SRI was initially developed for irrigated rice production but has successfully been adapted to rainfed systems. The best practices and concrete adaption measure concern all the steps of the rice planting process. The combination of the practices results in synergetic effects that allow for healthy crop development and for plants to express their genetic potential (see figure 2 above). Other best practices for SLWM and IPM will be associated throughout the crop production process from soil preparation to harvest. These best practices will be continuously improved, and the RICOWAS project will encourage

further adaptation and innovation and will remain open to improvements. The project will therefore periodically update the training modules to expand on the improved best practices.

The CRRP process involves many implementation steps during the crop production season. CRRP is knowledge intensive, and its implementation success will depend on how well farmers understand the biological processes behind the use of certain practices, and how well they are able to best implement the CRRP practices in their own fields. This will require a lot of technical exchange and fine-tuning. The RICOWAS project strives for i) highest quality of knowledge-sharing, be it via trainings, assisting and advising farmers directly in their fields, or facilitating knowledge-sharing events, ii) participatory development of locally adapted best practices for CRRP, and iii) providing access to processes, tools and equipment that support the CRRP production and post-harvesting activities. These elements are key for a sustainable and effective scaling-up of CRRP as farmers will have obtained the capacity and means to pursue climate-resilient rice farming beyond the project's timeline.

2.2. CRRP best practices implemented by RICOWAS

The following best practices represent the core practices for SRI and SLWM the project will promote and scale-up under Component 2. The module approach adopted by the project allows to be flexible and participatory. It is expected that additional practices will be added, tested with farmers and expanded as the project is implemented. The categories of best practices include:

1. Seed management and seedling production for SRI
    - Seed management
    - Seed production
    - Raised-bed nurseries
2. Plant establishment in the field
    - Transplanting
    - Direct seeding
3. SRI-CRRP water management
    - Irrigated systems
    - Rainfed systems
4. CRRP soil and nutrient management
    - Soil preparation and soil management
    - Nutrient management and fertilization
5. Weed, pest and disease management
    - Weed management
    - Pest and diseases management

1. SRI best practices for seed management and seedling production

Seed management is part of the first SRI principle of early and healthy plant establishment. Good seed management is key to crop production success. RICOWAS will promote best practices for seed harvesting, seed storage, seed sorting and seed soaking before planting. Implementing these steps will result in high seed quality, viable seeds, high germination rate, and high seedling quality. This allows the farmers to have very good control at the start of the planting season.

Seed production with SRI**:** There are very compelling advantages to using SRI for seed production. Farmers in many countries have adopted SRI to do this. SRI can be used to produce seed for farmers' own needs or to produce seed for the market. The project will provide specific trainings on seed production with SRI and assist farmers to develop seed production businesses.

Raised bed nurseries: SRI uses raised-bed nurseries to produce vigorous seedlings in only 8 to 12 days. Raised bed nurseries differ from conventional flooded nurseries that use more land, water, fertilizer, time and much more seed. Low density seed sowing is a characteristics of SRI nurseries. This responds to the first and second SRI principles to favor quick and healthy plant development and to reduce competition among plants. This results in the production of uniform, vigorous and healthy seedlings that are easy to transplant. Seedlings are ready to be transplanted at the 2-leaf stage, only 8 to 12 days after germination

Preparing the raised bed nursery

Sowing of rice seeds

Watering the seedlings in the raised bed nursery

2. Plant establishment in the field

Planting (either transplanting or direct seeding) is one of the key operations that determine the success of an SRI field. Best practices are well known that make the transplanting process easier and faster for the SRI methodology. The RICOWAS will promote these best practices to ensure good success of the SRI fields. SRI transplanting involves three main activities: field marking, uprooting and transporting the plants, and the actual transplanting. SRI uses a precise grid to space the plants. This ensures that each plant has enough space to grow, and that mechanical weeding is effective and can be done in both directions (horizontal and perpendicular).

Marking strategies: The three most common marking strategies are roller markers, rakes and ropes. Farmers have also developed their own effective marking prototypes (see figure below).

Marking tool models such as rakes and rollers will be made accessible by the project to farmers for more efficient and quick transplanting process. These are simple tools and some farmers might be able to produce these tools themselves or to acquire them locally at an acceptable price. The project will introduce farmers to different marking tools and techniques. Examples for three marking techniques are shown below:

Marking rakes can be used in irrigated and rainfed conditions (two passages are needed for marking)

Roller markers are most efficient to mark a grid in only one passage

Farmer innovation of a simple bamboo grid, which is easy to build and at no or only low cost to farmers

Uprooting of seedlings: Contrary to conventional seedling production - where seedlings are pulled out of the nursery, which is breaking off the roots - the SRI nursery and uprooting practices focus on keeping roots fully intact throughout the entire plant establishment phase. Seedlings are uprooted by using a shovel below the root horizon and lifting the small seedlings with their entire root system and soil attached onto a plate, transported to the field and transplanted ideally immediately. Because the roots of SRI plants remain intact and the seedlings are still small, the transplanting shock is minimal, and plants establish fast.

Transplanting is done with single young seedlings at the 2-leaf stage, usually between 8-12 days old, in a grid pattern with wide spacing between hills of 25cm x 25cm. Seedlings are planted superficially, which favors good tillering.

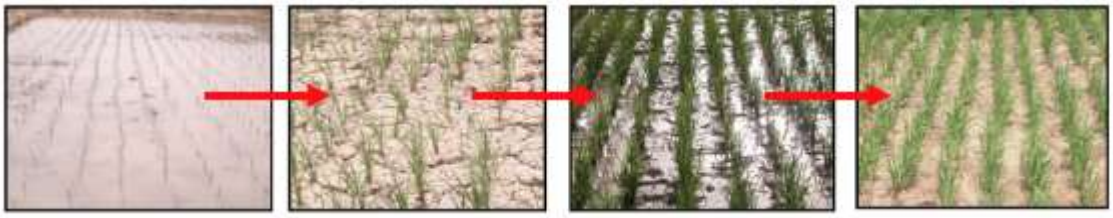
Direct seeding of rice: In rainfed conditions (but also in some irrigated conditions), direct seeding of rice is more suitable and profitable. For this the project will support access to i) SRI direct seeders (developed and available by SOCAFON and IER, Mali), and ii) drum seeder (adjusted by IER from the Philippines' model to West African conditions and available through IER and SOCAFON, Mali).

3. CRRP water management

Good SRI water management provides the rice plants with enough water for optimal plant development. There should be no permanent flooding or drought stress. Rice can tolerate but does not thrive in stagnant water, as rice roots need to breathe to grow well.

- **CRRP water management in irrigated systems**

By using the **Alternate Wetting and Drying (AWD**) method, it is possible to save up to 30-50% of water, which can reduce a large input cost, especially in the Sahel. With AWD a rice plot is irrigated with only a shallow layer of water of about 2 cm, followed by letting the plot dry out, before another shallow layer of water is added. This is repeated throughout the vegetative rice production process, and allows plants to tiller well, and for mechanical weeding operations to take place. During the flowering and grain filling period, a shallow layer of water is maintained in the field.



- **CRRP water management in rainfed conditions**

Lowland rice systems might be similarly set up as irrigated fields. AWD might be fully or partially implemented depending on water control. In systems where extensive flooding occurs in the second part of the rainy seasons, advancing the time of planting has shown to work well in Liberia. It allows the rice crop to benefit from non-flooded conditions during the vegetative phase, which promotes tillering and results in increased yields. The SMART Valley approach (as developed by AfricaRice) will be promoted by the project especially in rainfed lowland systems. This approach allows farmers to analyze the water flow within the landscape, and with simple interventions of earthen bunds to channel, retain or evacuate water within the landscape for optimal irrigation and water control purposes.

For upland rice systems that are drought prone, the goal of water management is to keep soils moist and retain water throughout the rainy season within the plot. Best practices to support this include, among others, i) bunding of fields to store rainwater within the plot, ii) organic matter application and surface mulching to store and maintain soil moisture, and iii) create water storage tanks or small ponds, or dig wells that can assure additional irrigation and bridge periods of lacking rainfall.

Conservation agriculture practices as adapted to rice systems (reduced soil preparation, soil surface coverage) have not only important implications for soil health and soil nutrients, but also for managing water. The project will promote these practices of minimum-tillage and soil protection whenever possible. A specific technical module will be developed show-casing these practices as they are adapted to the respective rice systems in the different climate zones.

4. CRRP soil and nutrient management

- **Soil preparation and soil management**

Incorporation of crop residues during plowing is an efficient way to add organic matter to the soil. The straw residues should be incorporated at least 30 days before the actual planting, giving it time to decompose. Allowing cattle to graze on straw stubbles and weeds between rice seasons adds valuable animal manure to the field

Field levelling: After plowing, levelling of plots is a critical step for SRI field preparation. If a field is well levelled, multiple benefits are created: I) reduction of irrigation water amount needed, ii) irrigation water and fertilizer are distributed more evenly across the field, iii) crop management operations, such as transplanting, weeding and harvesting, become easier and faster, iv) crops grow and mature more uniformly, v) yields are increasing.

Earthen bunds around the fields are needed for irrigated rice, but they are also highly beneficial in rainfed rice production. In both systems they allow for: i) Improved water control for irrigation and drainage of a plot, ii) help reduce water and soil erosion, iii) retain organic matter and fertilizer in the field, thus preserving nutrients on site, and iv) in drought-prone upland systems, bunds help preserve water and soil moisture within the rice plot.

Incorporation of straw, compost, biomass during plowing

Levelling the field

Bunding around field boundaries

- **Nutrient management and fertilization**

Building fertile soils enriched with organic matter and rich in soil biota is one of the principles of SRI. With SRI, fertilization is based on additions of organic matter and supplemented with chemical fertilizers as needed.

- **The use of organic fertilization** improves soil fertility and health, enhances soil biological life, improves nutrient turnover in the soil, improves fertilizer use efficiency and water retention, reduces input costs, and can suppress pests, diseases and weeds. It also provides micronutrients not found in chemical fertilizers.
  Use of farm-based organic matter resources: Different **types of organic matter** can be applied to rice fields, alone or in combination:
  - Straw or other crop residues: this is the most available source of OM and should be used whenever possible.
  - Animal manure: well-decomposed chicken, cow, goat or sheep manure, or manure deposited directly in the field during grazing.
  - Compost: locally available biomass and crop residues can be composted, ideally in combination with animal manure. Different methods will be promoted by the project, e.g. pit or heap composting methods are appropriate in different climate zones.
  - Green manures: green biomass from fast-growing trees or plants can be cut and applied directly to the fields, for example from the leguminous shrub *Gliricidia sepium* or *Cajanus cajan* grown on the edges of fields.
  - Cover crops: fast-growing, nutrient-rich legumes can be grown in the rice field during the fallow period between cropping cycles. The advantage is that high quality organic matter is produced directly on site, without transportation costs. The cover crops will either be incorporated during plowing or can be used as mulch and directly been planted into it. This method is especially important for upland systems that are more drought-prone and where soils are often low in soil organic matter.
  - Intercropping or relay cropping with legumes, for instance with cowpeas (*Vigna unguiculata*)

303. Use of industrial organic fertilizers (Fertinova, Organova, Biostimulant) as used in Mali, Burkina Faso and Senegal (use only 1 t/ha instead of 10 t/ha), is an additional source of organic matter if farmers are not able to produce their own organic fertilizers.

- Use of chemical fertilizers can complement the organic fertilization as needed depending on local soil conditions. With SRI, application rates of chemical fertilizers become half or at times even less than half of the recommended dosage. This because fertilizer nutrients are not leached and become better available in organic matter enriched soils. Informed decision-making by farmers how, when and what types of fertilizers to apply also helps to reduce the dose of application. Methods such as slight incorporation of urea into soil instead of broadcasting or the deep placement of urea in association with SRI have shown to create significant yield benefits in Liberia, Mali and Burkina Faso. Other amendments have also been shown effective in climate-smart farming, such as the use of phosphgypsum to reduce methane emissions, as used in Senegal.

5. Weed, pest and disease management

Weed management: In conventional flooded rice systems, standing water is used as a primary means of weed control. Because SRI doesn't use flooding to control weeds, a different strategy is required. Weed suppression can be achieved by using a mulch layer as it is done in conservation agriculture, or through mechanical weeding. Both weed control strategies have secondary benefits besides simply preventing weed competition. Use of herbicides will not be encouraged by the project, given the toxicity to people, animals, plants, microbes and the environment, and based on high water usage in rice production where pesticides will be readily transported beyond the rice fields.

Mechanical weeding has become popular with SRI farmers in West Africa. The SRI-WAAPP Project imported new weeder models from India, which are available in the region and can be used for irrigated and upland conditions.

- The Cono-weeder has two cones, is a heavier weeder and used in lighter to medium heavy soils.
- The Mandava-weeder was imported from India by SRI-WAAPP. It has only one cone, is lighter, easier to use and less expensive to manufacture. The Mandava is also easier to use in heavy soils. (Picture below on the left)
- The upland weeder was also imported from India by SRI-WAAPP. It can be used in dryland soils and is therefore a good tool for rainfed rice production, both upland and lowland (when not in flooded conditions). The weeder is light and easy to use. (picture below on the right)
- Other weeders have been introduced in West Africa and will be considered by the project. Weeding efficiency and farmer preference will be evaluated. The project will support weeder multiplication, and distribution of the best weeders to the CRRP farming communities.

Pest and disease management: Pest and disease pressures are generally lower in SRI fields due to:

- Plants that are stronger and healthier (see introduction for details)

- The rice field environment is less humid. Pests and diseases multiply and develop better and faster in wet environments, which is favored by permanent flooding and the high density of the plant population. On the other hand, the moisture level in SRI fields is reduced by:
    - Periodic drying of rice fields when using the AWD irrigation method
    - The reduced plant population and wider spacing promotes air circulation through the rows of plants, which reduces the moisture level of the canopy.

The project will support the use of **Integrated Pest Management** (IPM) methods adapted to local conditions and rice systems before reverting to the use of pesticides. Fact sheets on major pests and diseases and their integrated management approaches exist with various research organization in the region. An integrated management approach starts with the correct identification of the pests and diseases, by understanding their life cycles, and by identifying options for an integrated management.

- This starts with using healthy seeds, free of weed seeds and treated before sowing against seed-borne diseases.
- Managing weeds, surrounding vegetation to the fields, as well as crop residues can be critical in reducing host plants. These host plants can harbor pest and diseases that can move over to the newly established rice crop.
- Efficient and timely fertilization is critical for pest and disease control. The SRI system is based on using organic fertilization, such as farmyard manure. This improves soil health, which strengthens the resilience of the rice system towards pest and disease pressures. Efficient, timely and reduced use of nitrogen fertilizer is to be considered, as high nitrogen rates can favor the proliferation of pest and diseases.
- Soil preparation can be strategically used to control pest and diseases, including weeds. Plowing at the end of the season (and not at the beginning) can assist in burying and eliminating weeds and insect eggs. Puddling can have the similar effect with burying and suffocating pathogens ahead of rice planting.

It is often a combined approach of several techniques that results in achieving improved health and resilience of the rice production system. RICOWAS will capitalize on the existing expertise and promote the best IPM practices as indicated.

Note about rice varieties: SRI is a variety-neutral methodology. It improves rice productivity for all types of varieties, from traditional varieties, to high-yielding varieties to hybrid varieties. The project will collaborate with NARS and AfricaRice to promote varieties that are better adapted to climate change, especially varieties with improved drought and flood tolerance.

Note about equipment and tools: Promoting labor-saving equipment and tools is an important focus of the project. Many of the equipment and tools have already been tested in West Africa. Many of them are also simple and can be produced by local blacksmiths. As mentioned above under the various practices, the most important equipment and tools for implementing SRI are: Markers, weeders, direct seeders for irrigated and rainfed rice systems, and transplanters. Additionally, and among others, threshers and drying glacis for post-harvesting and hand tractors for soil preparation are also essential tools and equipment the project will promote.

SRI Direct seeder developed by SOCAFON in Mali

Drumseeder

Thresher

Table 1: Summary of CRRP best practices promoted by RICOWAS in irrigated, rainfed lowland and rainfed upland rice systems

	Irrigated system	Rainfed lowland system	Rainfed upland system
Seed management	Seed selection, harvest, cleaning, storage (set of practices)	Seed selection, harvest, cleaning, storage (set of practices)	Seed selection, harvest, cleaning, storage (set of practices)
Seed production	Best practices for quality seed production with SRI (bundle of identified and specific practices throughout cropping season)	Best practices for quality seed production with SRI (bundle of identified and specific practices throughout cropping season)	Best practices for quality seed production with SRI (bundle of identified and specific practices throughout cropping season)
Seed preparation before planting	Seed soaking, discarding unviable seeds with salt-water method	Seed soaking, discarding unviable seeds (seed drying before planting)	Seed soaking, discarding unviable seeds, seed drying before planting
Transplanting of seedlings	Raised bed nurseries, marking strategies, root protection in uprooting and planting, shallow transplanting of 8-12 day old single seedlings	Raised bed nurseries, marking strategies, root protection in uprooting and planting, shallow transplanting of 8-12 day old single seedlings; Change in planting calendar if indicated	Only in places with enough soil moisture, otherwise not appropriate, change in planting calendar if indicated
Direct seeding	Adapted drum seeder for paddy	Adapted drum seeder/ dryland seeder	Adapted dryland seeder
SRI-CRRP water management	Alternate Wetting and Drying (AWD) irrigation	AWD, bunding, SMART-Valley approach, drainage canals, change in planting calendar to avoid flooding periods, short season rice varieties	Bunding of fields, SMART-Valley approach (if appropriate), contour plowing, mulching of soil surface, organic matter application to improve soil water storage, water storage tanks and wells for supplemental irrigation, short season rice varieties
Soil preparation	Incorporation of crop residues and other organic matter, field levelling, earthen bunds; introduce reduced tillage (conservation agriculture practices) where possible	Incorporation of crop residues and other organic matter, field levelling, earthen bunds; introduce reduced tillage (conservation agriculture practices) where possible	Incorporation of crop residues and other organic matter during plowing OR minimum tillage, surface mulching; earthen bunds, field levelling where possible
Organic fertilizer use	Straw and other crop residues, animal manure, compost, green manure, cover crops (between seasons), cattle grazing on crop residues between cropping seasons; industrial organic fertilizer	Straw and other crop residues, animal manure, compost, green manure, cover crops (between seasons); cattle grazing on crop residues between cropping seasons; industrial organic fertilizer; surface mulching, intercropping or relay-cropping with legumes (e.g. cowpea), crop rotation	Straw and other crop residues, animal manure, compost, green manure, cover crops (between seasons), cattle grazing on crop residues between cropping seasons; industrial organic fertilizer; surface mulching, intercropping or relay-cropping with legumes (e.g. cowpea), crop rotation
Chemical fertilizer use	Complement organic fertilizer with 1/2 of recommended dosage, Urea deep placement	Complement organic fertilizer with 1/2 of recommended dosage, Urea deep placement	Complement organic fertilizer only if needed and when enough rainfall
Weed management	Cono-weeder, Mandava weeder	Cono-weeder, Mandava weeder, dryland weeder	Integrated weed management, including seed cleaning, use of mechanical dryland weeder, summer plowing, efficient fertilizer and water management, mulching, rotations
Pest and diseases management	Locally appropriate IPM methods, including seed treatments, use of farmyard manure for soil health, remove hosts (weeds), soil puddling, use bio-pesticides (e.g. neem), timely and reduced use of nitrogen fertilizer, crop residue management or removal, adjust planting calendar, use resistant varieties	Locally appropriate IPM methods, including seed treatments, use of farmyard manure for soil health, remove hosts (weeds), summer plowing, timely and reduced use of nitrogen fertilizer, use bio-pesticides (e.g. neem), adjust planting calendar, use resistant varieties	Locally appropriate IPM methods, including seed treatments, use of farmyard manure for soil health, remove hosts (weeds), summer plowing, timely and reduced use of nitrogen fertilizer use bio-pesticides (e.g. neem), adjust planting calendar, use resistant varieties