

FEED THE FUTURE SIERRA LEONE SCALING UP AQUACULTURE
PRODUCTION PROJECT:

TECHNICAL PROPOSAL

A technical proposal in response to funding opportunity under PIO Grant

Submitted by WorldFish



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List of Acronyms

ABC	Agriculture Business Centre
BF	Breeder Farmer
BIG	Business Investment Group
BMP	Better management practices
CB	Community Bank
CFC	Cluster Farmer Connector
CGIAR	Consultative Group on International Agricultural Research
CRS	Catholic Relief Service
EC	Extension Coordinator
EIAN	Feed the Future Sierra Leone Entrepreneurial Agriculture for Improved Nutrition Project
GDP	Gross Domestic Product
FBO	Farmer Based Organisation
FMT	Field Management Team
FSA	Financial Services Association
FT	Facilitator Team
FtF	Feed the Future
IFAD	International Fund for Agricultural Development
INGENAES	Integrating Gender and Nutrition within Agricultural Extension Services
IVS	Inland Valley Swamps
IR	Intermediate Result
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organisation
MAFFS	Ministry of Agriculture, Food Security and Forestry in Sierra Leone
M, E & L	Monitoring, Evaluation and Learning Coordinator
MFMR	Ministry of Fisheries and Marine Resources in Sierra Leone
MOHS	Ministry of Health and Sanitation in Sierra Leone
PM	Project Manager
PMT	Project Management Team
RT	Research Team
SBCC	Social and Behaviour Change Communication
SDG	Sustainable Development Goals
SILC	Savings and internal lending communities
SPRING	Strengthening Partnerships, Results, and Innovations in Nutrition Globally
VSL	Village savings and loans
WARC	West Africa Rice Company
ZOI	Zone of Influence

Executive summary

The Feed the Future Sierra Leone Scaling up Aquaculture Production (SAP) project aims to increase fish production and consumption and incomes of small-scale farmers through strategic value chain interventions, enhanced market access, private sector investment and improved nutrition-related behaviors focus on Tokolili District. The project goal is in line with Feed the Future (FtF) Intermediate Results (IRs): 1) IR 1: Improved Agricultural Productivity; 2) IR 2: Expanding Markets and Trade; 3) IR 6: Improved Access to Diverse and Quality Foods; and 4) IR 7: Improved Nutrition-Related Behaviors.

As Aquaculture in Sierra Leone has a history of poorly-planned and unsuccessful, the SAP project ensures minimising risks to farmers through profitable and sustainable business models and value chain development interventions. Informed by the FtF Sierra Leone Agriculture pilot project, WorldFish identified key constraints - weak organization among aquaculture farmers; limited or no access to assets/inputs along the value chain; subsistence farming limits or prohibits access to markets; and low capacities among farmers and public and private sectors to engage in the development of aquaculture value chain - needed pragmatic solutions to small-scale aquaculture to be sustainable and increase fish production and income. To address the key constraints the project adopts the strategy to strengthen small-scale aquaculture farmers' capacities to organize into cluster farmer groups to step into value chain interventions as agribusinesses, access credit and innovative training to increase production through adopting good management practices, and collectively market their harvested produce. To implement this strategy project designed six key activity components: test pro-poor business models to promote aquaculture as a profitable and sustainable agribusiness to increase fish production and employment; improve input supply through private sector participation; develop strategies for marketing and market linkages for fish farmers and facilitate market access; contribute towards behavior change communication to increase fish consumption and improve processing and hygiene along the value chain; develop technical capacities among farmers and public and private sector actors to enter into and engage in the fish farming value chain; and monitoring, evaluation, and facilitate knowledge sharing and learning platforms to strengthen stakeholder coordination, collaboration, and understanding of aquaculture. Formation of cluster farmer groups with a lead farmer and two breeder farmers and operational village savings and loan scheme within each group is central to all business models. The models include facilitating cluster farmer access to microcredit and linkages to markets or facilitate contract farming.

The project target to leave behind a sustainable aquaculture value chain with 90 organised functional cluster farmer groups, involving 2250 farming households and benefiting around 15750 household members, with tilapia production capacity of 800 to 1000 tons/year with 180 on-farm breeders producing fingerlings in communities demonstrating a decentralized fish fingerling supply. At the end of the project, the tilapia fingerling supply capacity of 10 million is expected with a genetically improved tilapia broodstock and formulated fish feed production of 1,800 to 2,000 tons with participating farmers, private sector investors, state fish farm in Makali, and Agriculture Business Centres. By engaging in fish value chain the income of cluster farmers is anticipated to increase by 40%. Working in close collaboration with FtF Sierra Leone Entrepreneurial Agriculture for Improved Nutrition Project (EAIN) and HKI, through Social and Behaviour Communication messaging project intends to increase fish consumption to 30 kg/household/annum.

1.0 Narrative

1.1 Project goal

The aim of the Feed the Future Sierra Leone Scaling up Aquaculture Production (SAP) project is to increase fish production and consumption and incomes of small-scale farmers through strategic value chain interventions, enhanced market access, private sector investment and improved nutrition-related behaviors. The project goal is in line with the following Feed the Future (FtF) Intermediate Results (IRs)¹: 1) IR 1: Improved Agricultural Productivity; 2) IR 2: Expanding Markets and Trade; 3) IR 6: Improved Access to Diverse and Quality Foods; and 4) IR 7: Improved Nutrition-Related Behaviors. The project goal is also in line with the WorldFish mission of strengthening livelihoods, food security and nutrition by improving fisheries and aquaculture, and reflects the new FISH CGIAR Research Program (CRP) that will begin in 2017. The project goal also supports a number of Sustainable Development Goals (SDGs), and importantly, is in line with the Sierra Leone Strategic Framework for Sustainable Aquaculture.

1.2 Geographic focus

In line with Feed the Future Zone of Influence (ZOI), Tonkolili District is the target area for project interventions. Tonkolili District is one of the poorest and nutritionally-insecure regions in the country with a 25% childhood stunting rate. WorldFish will focus on all 11 chiefdoms in Tonkolili District. WorldFish in consultation with USAID may expand the intervention areas to other district(s), depending on project performance and resource availability.

1.3 Technical approach

1.3.1 General description of the targeted subsector and why it is targeted

The fisheries sector consists of three subsectors: the marine, inland fisheries and aquaculture. The targeted subsector of this project is aquaculture. The fisheries sector² is an important source of income, employment and food and nutrition security in Sierra Leone. It is one of the main

¹ Feed the Future Indicator Handbook Definition Sheets (June 2016).

² The following narrative is largely based on the findings of fish value chain assessment conducted by WorldFish under the pilot project in Sierra Leone.

contributors to the national economy, contributing about 10% to the GDP (Neiland et al., 2016). Fish forms the most important animal-source food in the diets of Sierra Leoneans, providing about 80% of animal protein intake, and is critically important for nutrition, especially in a country that ranks very low globally in poverty and nutrition outcomes (22% of the national population is undernourished; 29% of children under 5 years of age are stunted; 20% of children 6-59 months age suffer from vitamin A deficiency).

Fish supply in Sierra Leone derives mainly from marine fisheries, followed by inland fisheries, with so far only limited production from aquaculture. Total fisheries production in Sierra Leone was estimated by the Ministry of Fisheries and Marine Resources (MFMR) to be 150,700 t in 2010. Over 90% (137,000 t) of fisheries production is estimated to be from the marine fisheries sub-sector with the remainder from fresh water fisheries (comprised of inland fisheries and aquaculture). It is estimated that the fisheries sector provides employment for over 500,000 people mainly in coastal communities (Neiland et al., 2016). Overall, the fish resources of Sierra Leone have an estimated capitalized economic value of USD 735 million (Neiland et al., 2016). Inland capture fisheries take place in rivers, a few lakes, floodplains and swamps. At present, wild caught freshwater fish production is at a low level (15,000 t), captured from riverine areas and floodplains and mostly for home consumption, between 10-20% enters the local market. The natural fishery value chain is thus undeveloped.

An analysis of demand, trade, supply and consumption of fish in the country by the NEPAD working group on aquaculture (Hecht et al., 2012) predicted that there will be an overall shortfall of 32,000 t per annum in Sierra Leone by 2020. This shortfall could increase by an additional 10,000 t per annum once a fish export ban to the EU has been lifted. Considering the apparently stagnating marine capture fisheries, one viable option to cope with this shortage is to develop the aquaculture subsector.

Aquaculture in Sierra Leone is confined to freshwater pond culture of Nile Tilapia (*Oreochromis niloticus*) with Catfish (*Clarias gariepinus* and *Heterobranchus spp.*) as non-targeted, naturally recruited fish. The production system is a low input low output system, and consequently, production is subsistence. Aquaculture is mostly practiced in inland valley swamps (IVS) and wetlands, in small ponds (286 m²) with greatest concentrations in Tonkolili District. Out of 2,590 ponds recorded in the country, WorldFish documented 2,056 fishponds in Tonkolili District alone (79.4% of the total) (WorldFish Aquaculture Assessment Report, 2016). However, only 13% of all ponds found in Tonkolili District are currently operational with the remainder either producing intermittently or abandoned (*ibid.*). Pond-based aquaculture was introduced in Sierra Leone in 1976 with the establishment of a government fish breeding station at Makali in Tonkolili District. Despite efforts to develop the sector, aquaculture contributes relatively little production at present, estimated at less than 40 t (computed from WorldFish Aquaculture Assessment Report, 2016). The aquaculture value chain is the least developed among the three subsectors in fisheries.

The critical inputs for aquaculture, fry and fingerling and feed supply, are in limited and inconsistent supply. It is estimated the current supply of fish fry and fingerlings satisfy less than 34% of the demand. State fish hatcheries/farms in Makali (Tonkolili District) and Bo do not have specific fish hatchery facilities and Nile Tilapia fingerlings were produce by natural breeding in ponds. Makali hatchery was inactive for almost a decade until WorldFish supported rehabilitation and commencement of production. The method adopted for fingerling production by few farmers in Tonkolili through natural breeding in ponds is detrimental to the genetic quality of following generations due to inbreeding, and the lack of scientific breeding and selection, which leads to poor quality fingerlings and low yields. There is no fish feed manufacturing or reasonably processed, appropriate farm-made feed. Farmers surveyed during the assessment indicated they feed their fish with rice bran, cassava flour, termites, and/or

leaves. Organic or inorganic fertilizer is used seldom to improve productivity. Use of a single plant origin feed ingredient or mixing a few of them together to feed fish without due consideration of the nutritional requirement of the target species, and *ad hoc* use of lime and fertilizer adds little benefit. Consequently, the average fish yield is less than 1,400 kg/ha/year. With good management practices, there is a potential to achieve 2,500 kg/ha/year.

In Tonkolili District, land access for household aquaculture is traditionally not a problem and the chieftom elders make land available as and when needed. According to the site suitability assessment GIS models developed by the WorldFish pilot project, an area of 188,000 ha exists in Tonkolili District as suitable to develop pond aquaculture. There is a potential to increase the fish production in Tonkolili District to 23,500 t if 5% of the suitable area (9,400 ha) is developed with improved management practices to yield 2,500 kg/ha/year. This is sufficient to supply fish for 1.5 million persons at 15 kg per capita.

Men play an active role in the construction and management of fishponds, while women and children generally carry out the day-to-day maintenance and feed fish. Overall, less than 7% of surveyed fish farmers had received a loan for their fish farming operations (of approximately Le 170,000 on average). The most important sources of funds for fish farming come from personal savings (58%) and friends/relatives (11%). Economic analysis suggests that at present with current farming practices, fish farming is not profitable for the majority of farmers. The results of on-farm trials initiated by the WorldFish pilot project, employing formulated farm-made feed and inorganic fertilizer, have shown positive gross and net profits. While average costs for project farmers were higher than for non-project farmers, production and revenues from project farmers were disproportionately higher than for non-project farmers.

The majority of fish consumed within Tonkolili District comes from the artisanal fisheries in Western Area Coastal District in the form of smoked or dried fish. The nutrition assessment on dietary diversity revealed that 98% of the surveyed men and women consume flesh foods (fish

and shellfish, meat, poultry, organs, and grub). Of the flesh foods, most consumed was fish or shellfish (96%). A higher percentage of people consuming marine fish over freshwater fish is not surprising as marine fish is much more available in the markets than freshwater fish. The limited availability of freshwater fish is directly linked to low production levels and seasonality. The farmed tilapia hardly reaches the local markets due to very low production quantities. Based on the fish sales from the pilot project, the average market price for tilapia is Le 10,000/kg; price ranging from Le 7000 to 18000/kg depending on the size. Around 60% of the harvest was sold directly to consumers indicating a short supply chain and limited market development.

Aquaculture in Sierra Leone has a history of poorly-planned and unsuccessful past interventions leading to high rates of abandonment. Future interventions must ensure risks to farmers are minimised through profitable and sustainable business models and value chain development interventions.

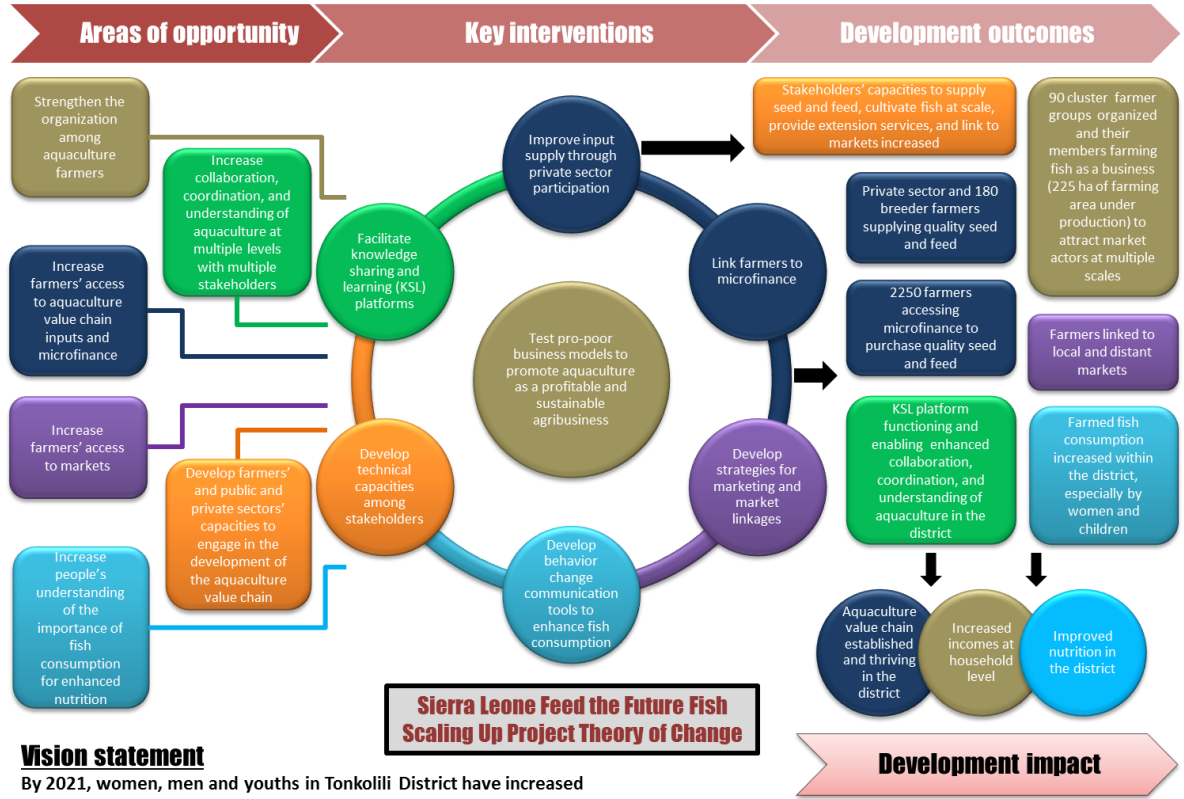
1.3.2 Theory of change

To increase fish production and consumption and incomes of small-scale farmers through strategic value chain interventions, enhanced market access, private sector investment and improved nutrition-related behaviors the project hypothesizes that:

- If:**
- Strengthen the organization among small-scale aquaculture farmers
 - Build capacity among farmers and private sector to enter into fish value chain
 - Increase farmers' access to aquaculture value chain inputs and microcredit
 - Increase their access to markets
 - Increase their understanding of the importance of fish consumption to enhance nutrition

- Then:**
- Stakeholder capacity to scale up aquaculture production will improve
 - Farming household incomes will increase
 - The nutritional status of households, including women and children will improve
- Contributing to:**
- Thriving small-holder aquaculture as an agribusiness improving household food security and nutrition status

- Because:**
- Stakeholder collaboration, coordination and understanding of aquaculture at multiple levels will be enhanced
 - Stakeholders' capacities will be developed to engage in input supply for aquaculture
 - Small-scale farmers will be better organized for collective actions and market oriented aquaculture
 - Farming households will learn improved aquaculture practices to increase yields
 - Aquaculture farming households will be supported to access inputs, credits and markets
 - Women will be empowered in gender-sensitive aquaculture practices to promote women participation in aquaculture
 - Men and women will understand the importance of fish in the diet and related hygienic practices in nutrition, including child nutrition



1.3.3 Key problems/constraints the SAP project will address

Small-scale aquaculture farms in Sierra Leone are characterized as largely owned and operated by households with limited access to assets, finance and material inputs such as fish seed, feed,

lime and fertilizer, and services such as extension and technical knowhow for better farming practices. Consequently, farm productivity is low and production is subsistence and farming has become unsustainable. Small-scale producers face varying degrees of financial, knowledge, market access and other constraints, and therefore commonly face difficulties in raising productivity and incomes to moving up the “enterprise ladder” to become more competitive medium- and small-enterprises.

There is need to help develop the capacities of smallholders and public and private sectors to participate in aquaculture value chain interventions as an agribusiness so that they can deliver what the market requires, and in turn encourage businesses to adapt their models to be inclusive and supportive of small-scale producers. There is also need to bring together different players and skills along the value chain for sustainable enterprise development. Investments in smallholder aquaculture can become sustainable through a shift to a more business-oriented approach, as well as access to services and better-functioning value chains connecting farmers to input and output markets.

A number of systemic and cross-cutting issues are in need of addressing to ensure a shift is made to a more market-oriented approach to fish farming, including: 1) weak organization among aquaculture farmers; 2) limited or no access to assets/inputs along the value chain; 3) subsistence farming limits or prohibits access to markets; and 4) low capacities among farmers and public/private sectors to engage in the development of aquaculture value chain.

1.3.3.1 Weak organization

Investing in better organization of small-scale producers and improved technical and financial services can pay dividends. An important opportunity to improve governance and management of the aquaculture sector, and thus increase the social and economic benefits to small-scale producers, lies in promoting and developing collective action in the form of farmer organizations (or clusters). Clustering of small-scale producers can create economies of scale

and volumes that attract business, sellers of fish feed and fry, buyers of aquaculture products, and build social capital if implemented taking into account local norms and practices. Recent experiences in the field show that promotion of cluster farming in aquaculture and developing capacities of farmers within clusters through better management practices (BMPs) can yield benefits. Clustering can enable small-scale producers to work together, improve production, develop sufficient economies of scale, enhance knowledge that allows participation in broader market chains, and improve resilience of farm production systems and farmers and their families, and thus, reduce vulnerability.

It was reported that the single most important constraint to inland valley swamps (IVS) utilization for farming activities in Tonkolili District was the high labour requirements (WorldFish Inland Valley Swamp Assessment Report, 2016). This is significant as several farming communities continue to lose farm labour through migration of youth to urban centres and other areas of economic opportunity. Over 49% of the farmers surveyed in Tonkolili District belonged to farmer groups (WorldFish Inland Valley Swamp Assessment Report, 2016). However, such organisation is notably absent among aquaculture farmers. The labour clubs are ready sources of farm labour that are utilized in farm production where farmers do not have money to pay for labour. Since labour clubs are not common among aquaculture farmers, they tend to hire labour clubs when necessity arises for fish farming activities.

Similarly, financial clubs, called *osusu* were reported to be very useful credit and investment methods. Therefore, strengthening organisation among aquaculture farmers into clusters has an advantage for the group to act as a “self-help” group to solve labour shortages, step into value chain interventions such as input supplies as an agribusiness, access to credit and innovative training, and collectively market the harvested produce.

1.3.3.2 Limited or no access to assets/inputs along the value chain

Fish farmers in Tonkolili District have access to land and water in IVS, but lack access to other inputs such as fish seed, feed, fertilizer, credit and financial services, and extension services. Accessing finance and funding mechanisms remains a key inhibitor for many small-scale aquaculture farmers to grow and invest in improved practices and value creation. In general, rural aquaculture farmers find it difficult to raise capital through formal banking systems because of high interest rates, paper work and requirement of collateral. Therefore, small-scale farmers tend to resort to informal credit such as financial clubs and private money lenders. The members of a financial club contribute monies either on a weekly, monthly, annual or biennial basis and give this to one member on a rotational basis. Club members are therefore able to access reasonable sums of money without interest and can invest this in fish farming and other agricultural production.

The *osusu* have been formalized into Financial Services Associations (FSAs) by the MAFFS. In Tonkolili District there are four functional FSAs where the highest number of fish ponds are concentrated. FSAs are meant to effectively and efficiently respond to most of the needs of the rural poor. They enable: 1) access to a secured savings facilities; 2) very short term and small loans (for social emergencies and “petty” trade) at easier conditions than those offered by moneylenders; 3) short term loans of limited amount for economic activities (agriculture, small ruminants, storage, etc.); and 4) access to bigger loans and longer-term loans depending on the amount of capital and reserves and eventual access to a refinancing facility. The primary beneficiaries of FSAs are market-oriented smallholders. Aquaculture farmers could therefore shift from subsistence farming to market-oriented farming into farmer based organisations (FBOs) or clusters and be more effective as organized groups.

Aquaculture farmers in Sierra Leone are also constrained by a limited supply of fish seed and no commercial fish feed supply mechanism. Fish seed supply for aquaculture used to depend

on state fish farms in Makali and Bo as well as in Njala University. State owned centralised fish seed supply has proven an unsustainable and unreliable source in many African countries.

Few farmers in Tonkolili District are currently engaged in production of tilapia fry and fingerlings. Often these farmers harvest small, naturally-bred individuals from the pond. This method leads to two problems: 1) over population and stunting and 2) erosion of genetic variation due to inbreeding. One remedy to these problems is to maintain a broodstock (or parent stock) and produce improved tilapia fingerlings in a hatchery environment. WorldFish designed a decentralized fish seed model during the pilot project to demonstrate the effectiveness of an improved fish seed supply system involving private farmers as breeders. A decentralized fish seed model is a strategy that makes quality fish seed available locally to support fish production through local and household farm-based hatcheries, hapa nursing, and trading networks. The model is designed to shift the dependence on a government hatchery's role as a fish seed supplier competing with private sector to a more practical role maintaining the genetic quality of broodstock. This would be more beneficial for the long-term viability of the fish seed industry.

Fish feed value chain actors do not exist in Sierra Leone. Improved on-farm and small-scale feed manufacturing technologies, feed handling and storage techniques need to be developed as value chain interventions.

Advisory services are critical to the success of rural small-scale aquaculture farmers who lack the necessary knowledge to implement good management practices to improve yields. The extension for aquaculture farmers is totally absent in Sierra Leone. MFMR does not have the capacity to deliver extension services for aquaculture farmers. Since there are no established value chain actors such as fish seed and feed suppliers, provision of extension services as part of their marketing strategy are also absent. Facilitating the development of value chain actors

such as private fish seed and feed suppliers and engaging private sector in contract farming and promoting cluster farmer groups are potent catalysts to fill the gap in extension services.

1.3.3.3 Subsistence farming limits or prohibits access to markets

Fish farmers in Tonkolili District lack access to both input and output markets. The primary constraint fish farmers face accessing output markets is unreliable production levels and quality of fish produced due to the nature of subsistence farming. Smallholders with good market access and the ability to supply fresh fish of consistent quantity and quality are likely to command higher prices and net returns, and influence the market to grow. IFAD (2010) has confirmed that farmers who produce fish for the market are generally better off than those producing for self-consumption. Producing for the market certainly requires a completely different approach to the occasional sale of subsistence production, and it is important that farmers can meet buyer requirements. Therefore, the primary challenge is to attract private sector actors to develop input supply markets, and shift subsistence fish farming to commercially-oriented fish farming that can meet buyers' requirements. IFAD (2001) also noted that the potential benefits of higher product prices and lower input prices due to commercialization are effectively transmitted to poor households when market access is guaranteed.

On the demand side, existing secondary data suggest that fish consumption in Tonkolili District is widespread (more than 90%) (Concern Worldwide; nutrition assessment on dietary diversity conducted by WorldFish) and regular (SPRING, 2015). However, despite this widespread and regular fish consumption, the SPRING assessment found that fish was only consumed in low quantities. Low consumption in terms of quantity is linked to the level of purchasing power of the rural poor as well as fish availability in the market. Majority of fish consumed in Tonkolili District comes from marine sources, with increased transaction costs. There is much less coming from local production (inland fisheries and aquaculture), which would likely reduce

transaction costs. The limited availability of local fish supply is directly linked to low production levels and seasonality. If aquaculture production could increase, there are potential local and distant market access opportunities for fish farmers, which include: access to local markets for farmers to become fish traders; access to traders at the local markets; access to the fish sellers association in Makeni (Bombali District) market; and access to cold storage owners in Makeni and Tonkolili Districts.

1.3.3.4 Low capacities among farmers and public and private sector actors to engage in the development of the aquaculture value chain

Capacity development including organizational development, training and sharing of information along the value chain is key to developing a sustainable aquaculture subsector. There is low capacity among poor small-scale aquaculture farmers to engage in sustainable aquaculture production with an identified market destination. Empowering them to do so by assuring adequate access to basic production inputs, credit and market-related information is necessary. Farmers' capacities need to be developed in the following areas: 1) good management practices on small-scale aquaculture to ensure sustainable production; 2) farmers (especially women and youth) to engage in value chain interventions such as fish seed supply, fish feed preparation, trading and on-farm primary processing techniques such as gutting and cleaning to delay deterioration of fish quality; 3) leadership and management skills. The approach of organizing farmers into cluster farmer groups has the best chance of success when farmers perceive that obvious economic benefits can be derived from group activities, and in particular, collective labor arrangements and knowledge sharing and learning; 4) what aquaculture as a business would entail. Empowerment of farmers to plan aquaculture operations to maximize production and profits, to access credit and convince credit suppliers their capacity to pay back loans, to implement their business plans and assess the profitability, prepare product supply plans for marketing, and to make the right investment decisions are key to understanding

aquaculture as a business. An understanding of business planning and business development for poor farmers who lack formal education and numeric skills may pose a challenge and thus some form of targeting is required to ensure that several farmers within the group/cluster have these skills to assist others who do not, otherwise interested farmers who lack these skills might get excluded from the process; and 5) access to existing market opportunities and negotiation skills for contract farming.

The private sector can be the major driver for sustainable linkages and often develops commercial linkages without the involvement of a third party. However, there is also a need to strengthen capacity among potential private partners to transform aquaculture from a non-viable, subsistence, public sector, and NGO-driven activity to an economically-vibrant, private sector-led, sustainable business. There is will among several potential private investors to enter into aquaculture value chain interventions such as fish seed and feed supply and fish production, and explore contract farming options with farmer groups, but lack technical skills. Support to these private investors to develop their technical capacities and help facilitate private-public partnerships or lease agreements with the MFMR to manage and operate state fish farms is needed and could be a potent catalyst for them to begin developing the aquaculture value chain.

1.3.4 Key activity components to address the above constraints

The following six project activity components aim to address the constraints identified above.

- 1) Test pro-poor business models to promote aquaculture as a profitable and sustainable agribusiness to increase fish production and employment.
- 2) Improve input supply through private sector participation.
- 3) Develop strategies for marketing and market linkages for fish farmers and facilitate market access.
- 4) Contribute towards behavior change communication to increase fish consumption and improve processing and hygiene along the value chain.

5) Develop technical capacities among farmers and public and private sector actors to enter into and engage in the fish farming value chain.

6) Monitoring, evaluation, and facilitate knowledge sharing and learning platforms to strengthen stakeholder coordination, collaboration, and understanding of aquaculture.

Component activity 1: This activity component involves designing and testing pro-poor business models for small-scale tilapia farming including fish seed and feed supply and grow-out farming, with business plans, including elaboration of the investment needs and returns on investments, guarantee systems and repayment controls, and organization of farmers in Tonkolili District into cluster farmer groups as an essential component of the development of a market-oriented approach. Testing of business models will be carried out through cluster farmer groups with private sector participation.

Component activity 1 outputs: Pro-poor business models that incorporate business plans that are developed and tested for sustainability purposes and cluster farmer groups established in Tonkolili District, with group numbers increasing from 10 in FY17 to 90 in FY20 and benefiting 250 farming households in FY17 and roughly 2250 in FY20, ultimately benefiting around 15750 persons, with a tilapia fish production capacity of around 800 to 1,000 t.

Component activity 2: This component addresses the issues of inconsistent and short supply of quality fish seed that has led to abandoned and/or inconsistent operation of aquaculture ponds and no formulated-quality fish feed supply that has led to low yields resulting in poor (and thus unreliable) production levels. These issues will be addressed by: 1) increasing on-farm fish breeding and feed preparation within the cluster farmer groups; 2) facilitating private sector participation in feed and fingerling production utilizing state fish farms through a private-public partnership or a lease agreement; and 3) initiating selected Agriculture Business Centres (ABCs) in Tonkolili District and West Africa Rice Company (WARC) to begin feed production as a business.

Component activity 2 outputs: Gradually increased tilapia fingerling supply capacity to 0.3 to 10 million in FY20 among participating breeders and private investors and gradually increase formulated fish feed production capacity to 1,800 to 2,000 t in FY20 among participating farmers, private sector investors and ABCs.

Component activity 3: Collaborate with the Catholic Relief Services-led Sierra Leone Entrepreneurial Agriculture for Improved Nutrition (EAIN) project to provide technical support to: a) determine the factors influencing small-scale fish farmers to participate in marketing of and available markets for their produce; b) develop strategies to link them to local as well as distant markets; c) facilitate linking to markets and d) develop on-farm preservation techniques and primary processing techniques to delay quality deterioration.

Component activity 3 outputs: Strategies developed to link cluster farmer groups to local markets through traders and fish sellers associations, and to distant markets through cold storage owners and contract farming with private sector investors.

Component activity 4: Collaborate with the CRS's EAIN project to provide support: a) reviewing existing social and behaviour change communication (SBCC) materials on fish consumption and food preferences within the district, providing recommendations on gaps to be addressed; b) developing, testing and producing SBCC materials on fish consumption targeting both community members and value chain actors; c) developing key messages to improve processing and hygiene along the value chain; and d) developing, testing and promoting fish-base recipes.

Component activity 4 outputs: SBCC messages developed and disseminated among community members in cluster farmer areas and among value chain actors, tested fish-base recipes for the first 1,000 days and on-farm techniques developed to reduce post-harvest quality losses of fish, and material developed to improve hygiene in fish handling and fish preservation.

Component activity 5: This component involves developing capacities in cluster farmer groups, private sector actors, selected ABCs, local government, and service providers during implementation of the project to facilitate entering into and engaging in the fish farming value chain.

Component activity 5 outputs: Trained cluster farmer groups, private sector actors, local government, service providers with a foundation of skills and knowledge to facilitate entering into and engage in the fish farming value chain.

Component activity 6: The project will employ a monitoring, evaluation, and learning (M&E&L) system in line with the CRS-led EAIN project to ensure the two projects assess and report on similar outcomes. The project will carry out a baseline study in FY17 to document status quo of fish farmers who enter the project. The project will monitor selected indicators quarterly (or when appropriate) and subsequently update the database. Reflections at multiple levels form an important component of the M&E&L system. Reflections carried out with farmers will identify successes and challenges and develop action plans to circumvent any issues before they become problematic. Staff will also reflect on progress made supporting cluster farmer groups, lead and breeder farmers at community level. These reflections will feed into monthly and quarterly reflections with project management. A district knowledge sharing and learning (KSL) platform will be set up in FY17 to help coordinate stakeholders, improve collaboration, and share lessons learned from project activities.

Component activity 6 outputs: Partnerships, networks, learning and knowledge sharing platforms and learning events, M&E&L plan with established baseline, and communication products that have led to wider adoption of promising business models and technologies, and policy briefs for evidence-informed policy making.

1.3.5 Strategy and implementation approach

The general strategy of the SAP project is to strengthen small-scale aquaculture farmers' capacities to organize into cluster farmer groups to step into value chain interventions as agribusinesses, access credit and innovative training to increase production through adopting good management practices, and collectively market their harvested produce. The project will include at least 40% female farmers (900 of a total of 2250) in cluster farmer groups and empower them to take up gender-sensitive aquaculture technologies such as fish feed preparation and seed production, among others. The SAP project would build on the strengths of the pilot project to further strengthen partnerships and/or to build new partnerships with MFMR and MAFFS, Njala University, CRS, INGENAES, BRAC, the Business Investment Group (BIG), and WARC to adopt approaches to scale up fish production. The project will include actors in specific geographical areas in Tonkolili District on specific value chains, with clear product-market combinations. Based on this approach, the project considers farmers as small entrepreneurs and not as beneficiaries or target groups and promotes market-oriented production and value chain development following the implementation approach described below.

1.3.5.1 Organizing and mobilizing farmers—organization of cluster farmer groups

The project will organize farmers into cluster groups or units (consisting of 25 farmers) to scale up fish production and to partially meet the fingerlings requirement. Within each cluster, each farmer will engage in individual farming, but the group will act as a “self-help” group for labor requirements and a quasi-farmer field school or model farming village to access innovative training, and product supply unit for marketing. The estimated total number of cluster farmer groups at the end of FY20 is 90. The number of cluster farmer groups would increase gradually up to the fourth year (see table below). Consequently, the number of farmers would increase gradually up to 2250 and benefiting around 15750 people. Initially the project would build on

the strengths of pilot project community groups to mobilize farmers into cluster groups in FY17 and then focus on formation of new cluster farmer groups³ in FY18 to FY20.

Table 1. Projected cluster farmer group formation

Project implementing year	FY17	FY18	FY19	FY20	Cumulative
Addition of cluster farmer groups	10	20	40	20	90
Participating farmer addition in successive years	250	500	1,000	500	2250

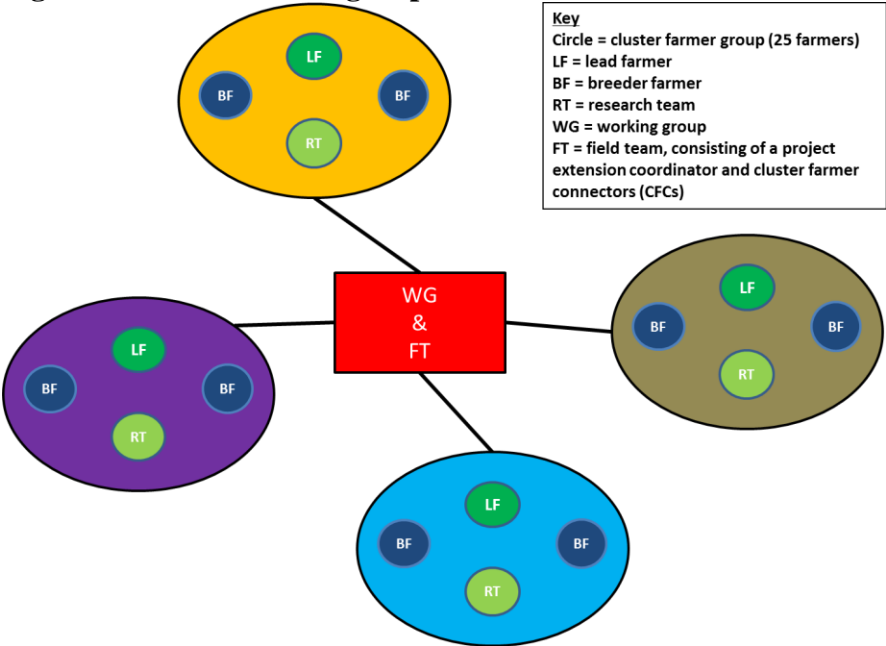
At the initial stages of the SAP project, a working group (WG)⁴ that consists of local MAFFS, MFMR, representative from Njala University Agriculture Extension, selected ABCs, and the SAP project Extension Coordinator and other staff would be formed through a MoU to identify and help arrange cluster farmer groups. Among the institution participating in the WG, local MAFFS and MFMR would nominate a facilitator and these facilitators together with the project Extension Coordinator and other staff would act as the field team (FT) to form cluster groups. Within each cluster group there will be a Lead Farmer (LF). Two approaches to selecting LFs will be tested: 1) selected by the group with consensus of the member farmers in the cluster group and 2) LF will be identified first and she/he will select the member farmers and form the cluster group. Women LFs will be strongly encouraged. The selection or identification of a LF will be based on their: active role and experience in aquaculture; role and earned respect in the community; literacy level and numeric skills; and demonstrated leadership in other group activities. The main roles⁵ of the LF will be the focal point for the cluster for articulation of specific technologies, farmer capacity development, and entry point to adopt farmer learning approaches for extension and service providers.

LFs from relevant cluster groups will represent their members in the WG. The project will provide additional technical inputs as necessary to the WG by mobilizing project staff.

³ The selection criteria for cluster farmer groups and their roles are found in Annex 1.
⁴ The role of the Working Group is found in Annex 1.
⁵ The complete list of LF roles is found in Annex 2.

A two member research team (RT) will be formed for each cluster farmer group. The main roles² of the research team will be to work closely with the LF, Cluster Farmer Connectors (CFCs - WorldFish staff living and working in selected rural areas) and EC to help in technical dissemination and collection of market information. CFCs will help facilitate the selection of LFs and RTs who will provide technical support for adopting good management practices and business development, among other skills⁶. The project will employ a total of 9 CFCs, each connecting 10 LFs in 10 cluster farmer groups. CFCs will be supported by the EC in the field. The recruitment of CFCs will be carried out in a staggered manner as per the number of cluster farmer groups formed each year. Figure 1 presents a diagrammatic representation of the cluster farmer group model and all its supporting components.

Figure 1. Cluster farmer group model



1.3.5.2 Linking to credit supply

Initially each cluster farmer group would be linked with either microfinance suppliers for credit or with private sector investors for input supply under contract farming or with a Financial Service Association (FSA) or with a community bank (CB). In Tonkolili District there are four FSAs (in Konike Sanda, Konike Barina, Kalansogoiya and Yoni Chiefdoms) and three CBs (in

⁶ The CFC’s roles and responsibilities are given in Annex 3.

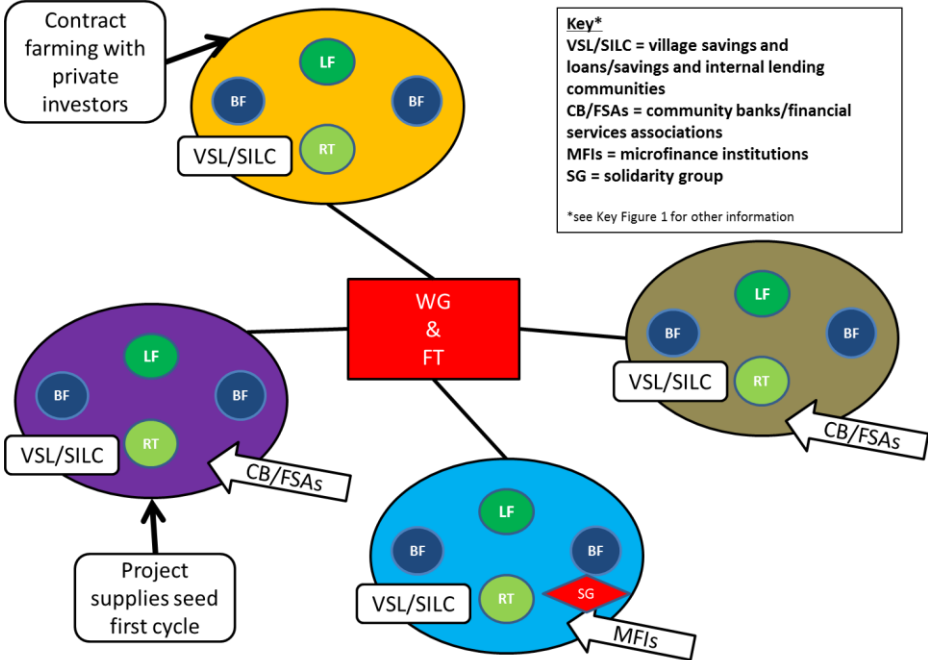
Konike Sanda, Kalansogoiya and Yoni Chiefdoms). Depending on the microfinance institution (MFI) requirement, within a cluster farmer group solidarity groups (SGs) will be organised. Each SG would have around five to ten members to collectively guarantee each other's loans, thus replacing traditional collateral requirements. Moreover, considering the cropping pattern and duration of fish farming, the project may need to help facilitate "seasonal credit" for cluster farmers with five to six months to one year duration and lump sum payment at the end of the farming cycle given that most MFIs require repayments regularly and soon after receiving a loan. The SAP project already commenced discussions with BRAC and Apex Bank (the regulator of FSAs and CBs) for microcredit supply and the BIG (a group of local investors) for contract farming with positive responses. Contract farming would entail investors to provide inputs to farmers on a buy back arrangement on an agreed price. The contribution from the project for the partnerships with credit suppliers and private investors is technical support, monitoring and supervision of the production cycles and capacity development to ensure targeted production, and partial input supply for the first production cycle, except for contract farming.

The SAP project will develop capacities among the group members on village saving and loans and organize a functional village savings and loans (VSL) schemes (or savings and internal lending communities - SILC, which is the model CRS promotes) by fielding a business development specialist, including decision making in credit management, the determination of loan size, interest rates to members and repayment periods and rates to lend among themselves through their savings to continue their farming with reduced amounts of microfinance from MFIs in subsequent farming cycles. It is expected that because of the relative homogeneity of members, default risks are minimized; members are familiar with each other, allowing for a fairly reliable source of information on potential loan diversions and defaults.

The project would also target farmers who are already members of FSAs and VSL schemes to mobilize them to form cluster farmer groups for fish farming to capitalize on their ability to obtain credit and savings and lend among cluster group members.

Figure 2 presents a diagrammatic representation of how the project intends to link cluster farmer groups to microfinance options. Given the many options available, the project will test a number of different pro-poor business models including: 1) linking to credit through MFIs; 2) linking to credit through Community Banks (CBs) and/or FSAs; 3) linking to CBs and/or FSAs for loans to purchase fish feeds and the project supplies seed for the first culture cycle; 4) linking to private sector investors for contract farming; and 5) VSL or SILC is common in all models.

Figure 2. Linking cluster farmer groups to credit



1.3.5.3

Linking to markets

The WG will provide an enabling environment to help increase farmers’ access to profitable market engagement through support from various institutions like local MAFFS, MFMR, microfinance institutions, private sector actors, and Njala University. The project will closely collaborate with the market access interventions for poor smallholder farmers and development of market linkage strategies by the EAIN project to gather information on the market actors,

their marketing activities, costs and margins, and constraints and opportunities related to the movement of fish. This information will supplement the information collected by the Fish Value Chain Assessment carried out by WorldFish in the pilot project to implement market linkage strategies. Moreover, at the initial stages of project implementation aquaculture business plans (including production plans, supply plans, market plan and management and financial plans) will be prepared by cluster farmer group members with support from a WorldFish business development resource person and the FT, which then could be replicated as new cluster groups develop.

The development of strategies for market access would be for output markets as well as for input markets. The project will develop market linkage approaches that will enable farmers to do the marketing themselves. Since most aquaculture farmers are relatively poor and cannot afford to take additional economic risks, the project will initially connect them to local traders and traditional markets. Returns on investment may be lower when selling to local traders, but choosing simpler marketing activities that they are comfortable with will increase their chances of success. This may be a prerequisite for them to become more confident and take on higher risks with higher-value, distant markets in the future. For collective marketing, where necessary, few clusters would be brought together through a small inter cluster committee (ICC) consisting of lead farmers of the respective cluster groups. Farmers could be linked to the following local and distant market access opportunities: 1) local markets for farmer to become a trader; 2) traders at the local market; 3) fish sellers association⁷ in Makeni (Bombali District) market; 4) cold storage owners⁸ in Makeni and Tonkolili District; and/or 5) traders and private investors in contract farming to access distant markets.

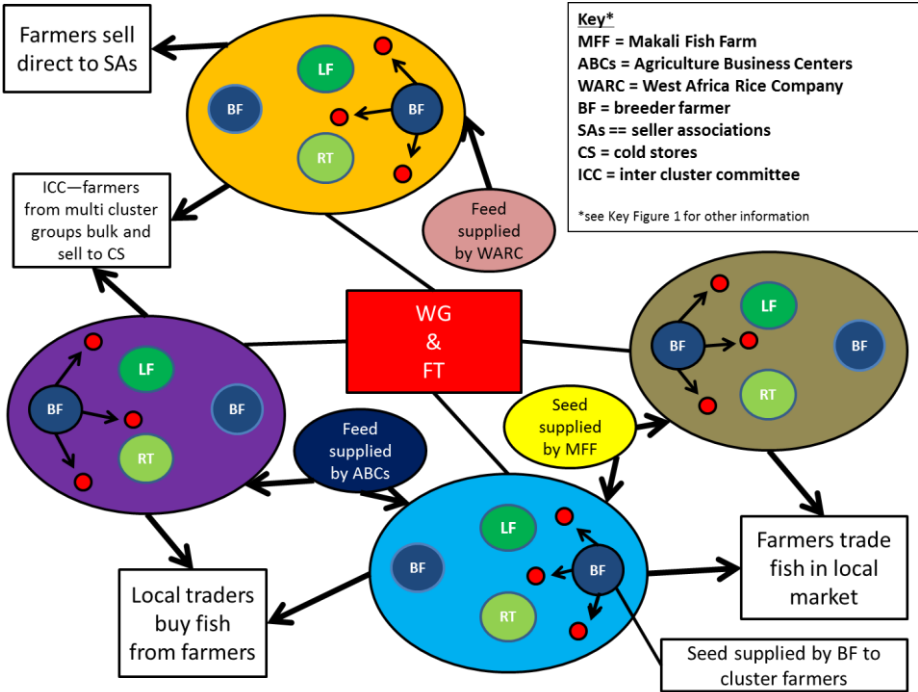
Since no value chain actors for input supply such as fish feed and seed exist, the SAP project will support and facilitate private sector investors (BIG and WARC) and ABCs to engage in

⁷ Fish sellers association has 89 members, with 50 women, who are in retail business.

⁸ There are eight cold storage owners in Makeni (Bombali District) and Tonkolili District.

fish feed and seed supply to ensure access to critical inputs by small-scale fish farmers. The project will also develop capacities and facilitate selected small-scale fish farmers (breeder farmers) to step into fish seed and feed supply. See next section for more details. Figure 3 depicts the potential market arrangements that could unfold over the course of the project.

Figure 3. Output (and input) market linkages



1.3.5.4 Ensure input supply

The SAP project will play a facilitator role to help create an enabling environment for aquaculture enterprise by engaging with various institutions and private sector actors who will provide fish farmers with services and market linkage opportunities. The most critical inputs that are in short supply are fish seed and feed. The project will improve upon the formulated feed and feed production and the decentralized seed supply approach piloted in the pilot project by facilitating and providing technical support for on-farm fish breeding in each cluster farmer group and for private sector investors who will manage and operate Makali (and eventually Bo) fish farms through a private public partnership or on a lease agreement.

The LF will be a breeder as well as a grow-out farmer. In each CFG, there could be other farmers (up to two per group based on interest/levels of expertise) engaged in on-farm breeding to meet the fingerling demand in each group/area. In each CFG there will be at least two breeder farmers (BFs). The on-farm breeders⁹ in each group are to produce fingerlings to satisfy (most likely) a partial requirement for group members to function as grow-out farmers. The balance fingerling requirement is to be produced by private sector investors (see table below for fingerling production forecast). Some BIG members have already started negotiating with the MFMR to manage the state owned Makali fish farm on a lease agreement. The project will provide technical advice to Makali and Bo fish farms to manage broodstock and fingerling production to supply to cluster farmers. The project would enter into a MoU with the private sector investors who manage Makali and Bo fish farms to ensure seed supply for cluster farmers. The fish feed requirement to meet the targeted fish production by CFGs and sources of fish feed production is found in Table 3.

Table 2. Projected fingerling requirement and source of supply

	Yr 1	Yr 2	Yr 3	Yr 4
Fingerling requirement (millions)	0.31	2.5	6.25	10.00
Source of supply (millions):				
Makali and Bo fish farms (by private investors)	0.31	2.0	4.15	5.5
Cluster farmer groups		0.5	2.1	4.5
Target fingerling production for each cluster /year		0.017	0.03	0.05

Table 3. Projected feed requirement and source of supply

	Yr 1	Yr 2	Yr 3	Yr 4
Fish feed requirement (tonnes) ¹⁰	62.5	500.0	1,250	2,000
Source of supply:				
Private investors (Makali & WARC)	62.5	500.0	1,000	1350
Selected ABCs	-		200	500
Selected cluster farmer groups	-	-	50	150
Number of cluster farmer groups under feed production	-	-	2	6

⁹ List of BF roles and responsibilities is found in Annex 1

¹⁰ Fish feed required by each cluster farmer group is 25t/year.

WorldFish already established a locally-made functional feed mill with a production capacity of 160 kg/hr or 18 t/month or 216 t/year. The fish feed production capacity can be increased at Makali fish farm to 1,400 t/year with a combination of already existing 160 kg/hr feed mill (216 t/year capacity) and 300 kg/hr (396 t/year capacity; approximate cost USD 6,000) and 600 kg/hr feed mills (792 t/year capacity; approximate cost USD 8,000). The project will provide technical support to private sector investors who operate the Makali and Bo fish farms to scale up fish feed production and for selected CFGs. In addition, the project will collaborate with WARC to determine how they can begin to engage in fish feed production given the large quantities of rice, but also maize and soy beans they produce. WARC and WorldFish will develop a fish feed production and supply strategy, for implementation in early 2017.

The project will also develop capacities of ABCs (at least four) to step into fish feed production and supply. Functional ABCs already possess some of the ingredients such as rice bran, a by-product from rice milling. Some ABCs (e.g., Makoniline ABC) have palm kernel, a by-product from processing palm oil. Cassava is available in rural areas. Fish waste is available in local markets and can be milled and incorporated into fish feeds to enhance the protein content. The project will also seek a partnership with FAO to establish feed mills at ABCs under their project on Sustainable Aquaculture Development. FAO already has plans to establish feed mills in Tonkolili and Bo Districts. ABCs are to commence feed production from second year onwards and CFGs from third year onwards after gaining training and skill development. Figure 3 also depicts how key inputs (seed and feed) will be supplied to CFGs.

1.3.5.5 Promote fish consumption

Despite widespread and regular fish consumption in Tonkolili District, it is documented that fish is only consumed in low quantities. In keeping with expected results under the Feed the Future initiative (FTF) in Sierra Leone to achieve increased market-based production of nutrient-rich crops to improve nutritional status of women and children through value chain

investments and behavior change for improved nutrition, the project will collaborate with the EAIN project to increase fish consumption as a nutritious food. SPRING has been identified to coordinate with the EAIN project on components related to nutrition. The project will collaborate with SPRING and provide technical support on the following: 1) review existing SBCC materials within the district and provide recommendations on how to fill gaps; 2) help develop SBCC approaches and materials to increase household-level fish consumption; 3) help develop SBCC materials to improve dietary diversity through increased fish and other nutrient-dense foods consumption; 4) help develop and test fish-based recipes for the first 1,000 days; and 5) highlight key hygiene issues related to fish handling and preservation.

1.3.5.6 Extension and Advisory Services Capacity Development

Developing capacities to enhance the aquaculture value chain will be prioritized at the cluster farmer group and local services levels. Due to the historically subsistence level of aquaculture in Tonkolili District, a significant challenge is to increase accessible technical support and extension services specialized in semi-intensive aquaculture for smallholder farmers. Currently MAFFS is the main source for agricultural extension in Tonkolili District, but does not specialize in aquaculture. Therefore, the project will collaborate with MAFFS extension officers to connect CFGs, stationed in the communities, with extension services and develop capacities to provide specialized aquaculture extension and advisory services. Main target groups for capacity development will be project CFCs, CFGs and LFs, district MAFFS extension and MFMR technical staff, BFs and other specialized and potential farmers within CFG communities, and technical personnel of private sectors investors and other value chain actors.

A training and capacity development curriculum for extension and advisory services is being developed in partnership with the University of Illinois INGENAES Project and the Department of Extension at Njala University. The training program is first targeting CFCs in preparation

for their CFG assignments. The extension curriculum focuses on developing capacities in the following three core areas (see framework below):

1. Technical support and innovation dissemination

- a) Promotion of good management practices to increase farmed fish yields through direct technical support by CFCs and LFs for cluster farmer groups;
- b) Trainings and engagement with input suppliers to supply fish seed and provide on-farm breeding technologies;
- c) Feed formulation and preparation linked with value chain and private sector actors such as ABCs and BIG and WARC; and
- d) Technical support to promote knowledge sharing and learning platforms, decision-making tools, and ICTs, emphasizing farmer-to-farmer peer learning.

2. Local and public services engagement and strengthening

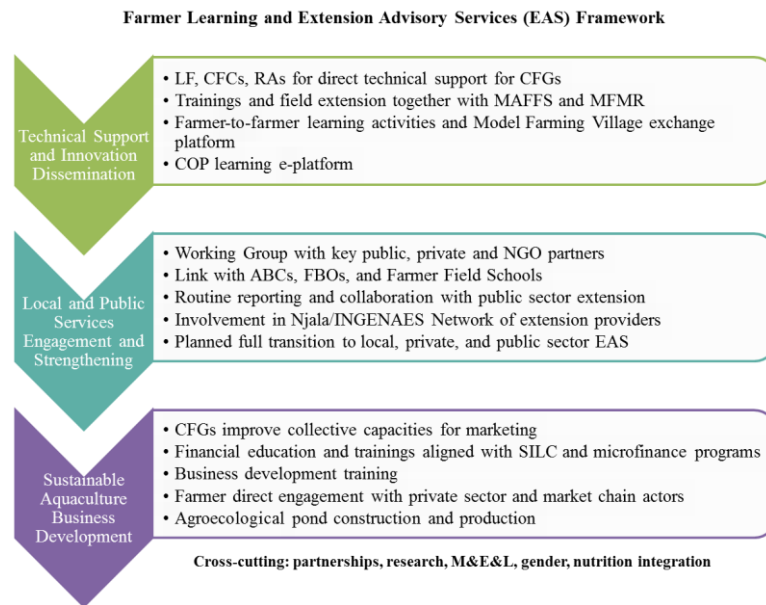
- a) WG with key stakeholders involved in the formation and validation of roles of cluster farmer groups in collaboration with the MAFFS;
- b) Membership in the Njala/Illinois INGENAES Network of public, private, NGO and civil service extension providers for gender and nutrition integration;
- c) Engagement with ABCs, FBOs, and FFSs in value chain development and technical capacity strengthening; and
- d) Transition to public and private sector pluralistic extension services through empowerment of LFs, cluster farmer groups, and engagement with value chain private sector technical personnel.

3. Sustainable aquaculture business development

- a) Business plan development training and leadership and group management skills; and
- b) Financial education aligned with local savings systems, microfinance, and/or contract farming to enhance farmer group saving and borrowing skills; and

- c) Promotion of sustainable and use of natural resources through agroecological pond construction and production practices.

Figure 4. Extension and advisory services capacity development framework



The design and coordination of the extension capacity development program will rely on key partnerships. Working together with INGENAES and Njala University, gender and nutrition integration will also be cross-cutting components of the training curriculum and farmer group formation process. Research and learning by both the farmers and the project will be emphasized.

1.3.5.6.1 Technical and advisory support in Guinea

Based on the extensive learning over the past 18 months in Sierra Leone working with Government and other stakeholders to improve the seed and feed supply in Tonkolili District, the SAP project will begin to provide technical and advisory services to Ministry of Fisheries and Aquaculture in Guinea in FY17. The aim is to enable them to undertake an aquaculture assessment and prepare a plan of action and start up to improve tilapia broodstock and fish seed supply, fish feed development, and improved grow out management practices. The technical and advisory support will be provided starting in FY17 through exchange of aquaculture

scientists and technical personnel. The extent to which the technical and advisory support in Guinea will depend on the availability of funds.

1.3.6 Projected results

Projected results/targets	Indicators
<p>A fish farming value chain developed in Tonkolili District with 800-1,000 tons/year capacity of tilapia with:</p> <ul style="list-style-type: none"> - 90 cluster farmer groups or around 2,250 farmers, including at least 40% female farmers, benefiting around 15,750 people in Tonkolili District - Around 213 ha of operational fish farming area - Privately-owned decentralized fish seed supply system in Tonkolili District with the capacity to supply 10 million fish seed <ul style="list-style-type: none"> o Includes 180 on-farm breeders, and privately operational Makali and Bo fish farms - Improved tilapia broodstock - Privately owned fish feed supply with a capacity of about 2000 t with 6 cluster farmer groups, 2 to 4 ABCs and Makali fish farm and WARC under fish feed production 	<p>Intermediate Result 1: Improved Agricultural Productivity Indicator 1.1: Gross margin per hectare, animal or cage of selected product Sub Intermediate Result 1.1: Enhanced Human and Institutional Capacity Development for Increased Sustainable Agriculture Sector Productivity Indicator 1.1.1: Number of individuals who have received USG supported short-term agricultural sector productivity or food security training Indicator 1.1.2: Number of farmers and others who have applied improved technologies or management practices with USG assistance Sub Intermediate Result 1.2: Enhanced Technology Development, Dissemination, Management, and Innovation Indicator 1.2.1: Number of technologies or management practices under research, under field testing, or made available for transfer as a result of USG assistance Indicator 1.2.2: Number of hectares of ponds under improved technologies or management practices as a result of USG assistance Indicator 1.2.3: Number of households benefiting directly from USG assistance under Feed the Future</p>
<p>Functional 90 cluster farmer groups with increased access to credit, inputs, markets & formal/informal business relations</p>	<p>Intermediate Result 2: Expanding Markets and Trade Indicator 2.1: Value of small-holder incremental sales generated with USG assistance Sub-Intermediate Result 2.1: Improved Access to Business Development and Sound and Affordable Financial and Risk Management Services Indicator 2.1.1: Number of micro, small, and medium enterprises (MSMEs), including farmers, receiving agricultural-related credit as a result of USG assistance</p>
<p>Increased incomes at household level (40%)</p>	<p>Custom indicator</p>
<p>Increased fish consumption in the district (30 kg/HH)</p>	<p>Intermediate Result 6: Improved Access to Diverse and Quality Foods Indicator 6.1: Total quantity of targeted nutrient-rich value chain commodities produced by direct beneficiaries with USG assistance that is set aside for home consumption Indicator 6.2: Women’s dietary diversity: Mean number of food groups consumed by women of reproductive age Indicator 6.3 Prevalence of women of reproductive age consuming a diet of minimum diversity Intermediate Result 7: Improved Nutrition-Related Behaviors Indicator 7.1 (custom): Number of agencies/groups/associations receiving SBCC materials aimed at increasing demand for and consumption of fish</p>

1.3.7 Communication with USAID on project implementation

As the SAP project's implementation agency managing this project, WorldFish assumes responsibility to communicate project progress through AOR for Guinea/Sierra Leone in form of progress reports and brief narratives and seek guidance and directions to fine tune project implementation plans. WorldFish will maintain open and collaborative communication with AOR for Guinea/Sierra Leone to make arrangements for the USAID personnel visiting Sierra Leone to visit project sites and arrange any consultations and monitoring as required according to timelines suitable for both parties.

2.0 Implementation work plan

The implementation work plan of the Feed the Future Sierra Leone SAP project for the four-year period is found in Annex 4, which includes the responsible staff and partners for each activity and the work plan on how the project will undertake activities during life of project.

3.0 Management and Implementation Plan and Key Technical Personnel

WorldFish has established the main management and operational office in Freetown and an office for managing field activities in Makeni. The project management team (PMT) is comprised of a Project Manager, Accounts Officer, and an Administrative Assistant. The field management team (FMT) consists of a Monitoring and Evaluation and Learning (M&E&L) Coordinator who also oversees the field office management, a Hatchery and Fish Feed Development Specialist, an Extension Coordinator, a Nutrition Specialist, a Communications Research Assistant, an M&E&L Assistant, and five Cluster Farmer Connectors (CFCs) (for FY17). The CFCs will be increased to nine and the recruitment of CFCs will be carried out in a staggeredly as per the number of cluster farmer groups formed each year. To support mobility for field activities the project has three drivers. The PMT and FMT will be supported by WorldFish technical and administrative staff from the regional office in Zambia and HQ in Malaysia.

WorldFish assumes responsibility for programmatic and financial oversight of technical interventions in compliance with USAID/Bureau for Food Security (BFS) and Feed the Future requirements. WorldFish will serve as the technical lead for implementation of all project components. WorldFish is also responsible for M&E&L processes, and will provide overall technical leadership in close collaboration with project and technical resource partners. The project management and implementation structure is found in Annex 5 and 6.

Key project personnel

The key personnel of the project will be a mix of international and Sierra Leonean national staff. WorldFish is committed to promoting gender parity of staff within project management and field teams. WorldFish will draw technical expertise in aquaculture technologies, communication, finance and administration from WorldFish's global offices for technical backstopping. The key project personnel are Project Leader, PM, M&E L Coordinator and EC. The technical expertise of key project personnel is found in Annex 7.

PMT

Project Manager (PM) (fulltime international staff): The PM will provide overall leadership and technical guidance to implement project activities. The PM will take the lead to establish collaborative relationships with key government ministries, implementing partners, and stakeholders so the program leverages resources and supports MAFFS, MFMR and MOHS. The PM will also take the lead to promote sustainability of project activities through effective networking, linkages to existing programs, and capacity development of project staff. The PM will report to the Project Leader (PL) in the Regional WorldFish Office in Zambia, who will also technically and administratively support the PM to manage and implement the project.

Finance Officer (FO) (fulltime national staff): Reporting to the PM, and under the indirect supervision of the PL, the FO will provide comprehensive financial management support to the project office such as, procurement, monitoring of funding, accounts and reporting;

management of income and expenditure; data maintenance of systems (One Corporate System), and support the PM on budgeting of various research activities. The FO will be supported by finance teams in the WorldFish Regional Office in Zambia and HQ in Penang, Malaysia.

Administrative Assistant (AA) (fulltime national staff): Reporting to the PM, and under the indirect supervision of the PL, the AA will be based in the Makeni Field Office to provide comprehensive administrative support to the project office, such as: overseeing office administrative procedures, providing procurement support, monitoring of funding, accounts and reporting, and processing of fund request and travel claims, provide all work-related logistic support, and support the PM on various research activities including conference/workshop setup and budgeting. The AA will be supported by administration teams in the Zambia and Malaysia offices.

FMT

M&E&L Coordinator (fulltime national staff): Project M&E&L Coordinator will be based in the Field Office to implement and manage the M&E&L system and field activities. The M&E&L Coordinator will work closely with the EC and assist in developing a strong WorldFish presence in Tonkolili District and working towards establishing WorldFish as a strong partner to government, the NGO community and private sector in aquaculture. This will involve managing and coordinating the implementation of M&E&L for project field activities - monitoring of progress, learning events and support in the field. The M&E&L Coordinator will report to PM.

Extension Coordinator (fulltime international staff) (EC): The EC will implement the project extension strategy/framework, strengthening the partnership/linkages between the project and the University of Illinois INGENAES Project in Sierra Leone. The EC will work under the PM and collaborate with the M&E&L Coordinator and Communications Research Assistant. The EC will report to the PM.

Hatchery and Fish Feed Development Specialist (part-time international staff): This Specialist will estimate demand for tilapia fry and fingerlings by CFGs and develop plans to meet the demand. The Specialist will design and develop operational on-farm tilapia breeding techniques and indoor tilapia egg incubation systems, implement a tilapia breeding program with CFGs to meet the fingerling demand by project cluster farmers and the tilapia broodstock development programme at Makali Fish Farm to improve the genetic quality, formulate tilapia feeds based on farmer-accessible ingredients and test for efficacy, train CFGs on tilapia on-farm breeding, fish feed preparation and good BMPs on tilapia grow out farming, and provide technical expertise for private partners to step into tilapia fingerling and feed production.

Nutrition Specialist (part-time national staff): The Nutrition Specialist will work in close collaboration with SPRING/HKI, partner to CRS EIAN Project, to identify gaps within the existing Social and Behaviour Change Messaging (SBCC) materials to promote fish consumption and formulate materials focusing on feeding practices and hygienic issues related to fish consumption. The Specialist will develop SBCC approaches and train project staff to use them, test these SBCCs and disseminate them among project households and fish value chain actors to promote increased hygienic fish consumption. Reporting to the PM, the Specialist will work in close collaboration with the EC.

Business Planning and Market Chain Analysis Specialist (part-time international staff): The Business Planning Specialist will be field-based to develop a business plan for project CFGs and to identify markets and market linkage strategies. This will involve training of CFCs and selected initial cluster farmers in the development of a tilapia aquaculture business plan for CFGs, including cluster production plan with costs and returns, cluster supply plans, collective marketing plans with market linkages and marketing cost estimations. The Specialist reports to the PM and M&E&L Coordinator, and close collaboration with the EC.

Communications Research Assistant (CRA) (fulltime international staff): The CRA will implement the project's communication strategy and associated products – creating awareness, understanding, and support for promoting good management practices of aquaculture as an agribusiness and value chains development. The Assistant will provide support to the M&E&L Coordinator and the EC to meet the communications objectives within the M&E&L mechanism of the project, and ensuring all communications outputs adhere to USAID branding guidelines. The Assistant will work under the PM, in close collaboration with the M&E&L Coordinator and EC.

Other essential project personnel:

M&E&L Assistant (fulltime national staff): Reporting to M&E&L Coordinator, the Assistant will be based in the field office to provide district-level monitoring, evaluation and learning assistance to the M&E&L Coordinator and EC, and logistical support to field activities. This will involve assisting in the planned monitoring and evaluation of project field activities, including regular monitoring of progress indicators and learning events and maintaining the M&E database. The Assistant will closely work with the EC and assist in developing a strong WorldFish presence in Tonkolili District and working towards establishing WorldFish as a strong partner to government, the NGO community and private sector in aquaculture.

CFCs (fulltime national staff): Reporting to the M&E&L Coordinator and living and working in selected project community areas, CFCs will provide district-level technical, field and logistical support to field activities in Tonkolili District, particularly oversee implementation of fish production scaling activities by the assigned CFGs of the project. The CFCs will work closely with the project EC to provide technical assistance to the CFGs. This will involve assisting in the day-to-day implementation of project CFG activities, including monitoring of progress, learning events and support in the field.

The lists of roles and responsibilities of all project staff and part-time specialists are found in Annex 8.

Financial Management and Auditing Arrangements

WorldFish manages grants and contracts using its agency financial model, which facilitates the simultaneous management of multiple programs supported by a wide range of donors. WorldFish uses an ERP called One Corporate System (OCS) to conduct its operations. This is an online integrated system. These ERP allow WorldFish field operations to identify and monitor the source and application of funds from all funding sources within each country. WorldFish has detailed policies and procedures governing financial management and transactions, both internally and with partners. WorldFish accounting records contain information on all awards, authorizations, obligations, unobligated balances, advances, assets, outlays, income, and interest. The agency has adopted International Financial Reporting Standards (IFRS) regarding control, transparency and documentation. WorldFish' highly qualified finance staff and management quality staff in Regional Office in Africa and Head Quarters in Penang ensure the integrity of finance operations, budgeting and reporting. Furthermore, FtF Sierra Leone SAP project Finance Officer's work is supported, supervised and reviewed by Regional Office in Zambia and Head Quarters in Penang for finance management quality and to monitor grant and contract recipient financial reporting and to prepare monthly project budget and expenditure reports.

Procurement and Supply Management

WorldFish has a well-established supply chain management system. Using OCS, WorldFish's procurement system ensures that all materials and services are acquired in an effective, equitable, economic manner while striving to maintain compliance with high standards and applicable regulations.

The agency's purchasing policy includes vendor selection process, authorization limits and segregation of duties. WorldFish's procurement manual provides with guidance to support efficient planning and adherence to best practices in procurement. In all of its programs WorldFish controls the cost of goods and services through value for money procurement by ensuring competitive supplier selection and bidding procedures WorldFish has systems and procedures to ensure it has the capacity to closely oversee and monitor procurement by sub-recipients, or to procure directly and to efficiently manage and monitor the distribution of goods. The agency has clear, detailed procedures for local and international procurement, documented in a procurement manual and forms that are used in each WorldFish operating countries.

4.0 Marking plan

The branding and marking plan outlines how Feed the Future Sierra Leone SAP Project will: (1) name and position the FtF Sierra Leone SAP Project, (2) promote and communicate the Feed the Future Sierra Leone SAP Project's goals and objectives to beneficiaries and local partners, and (3) identify and acknowledge all donor and partner contributions. Our goal is to ensure that all overseas deliverables and/or activities funded by the FtF Sierra Leone SAP Project meet USAID marking and branding requirements. The guidance contained in this Branding and Marking Plan is designed to cover all of the activities under FtF Sierra Leone SAP Project components, as outlined in this technical proposal.

Branding and marking plan is found in Annex 8.

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Annex 1 Selection criteria and roles of cluster farmer groups

Selection criteria for cluster farmers include:

- Members will be drawn from the same community to ensure group cohesion
- Farmers currently engaged in fish production in their own ponds
- Farmers with desire to do fish farming and own non-operational fish ponds that can be put into production
- Farmers have access to swamp or land and water to construct own ponds
- Farmers willing to work in a group for collective actions (share labour, collective marketing, access to credit and training)
- Farmers willing to actively participate, allocate time. take responsibility for putting in resources and self-reliance
- Farmer who belong to pilot project farmer groups
- Other existing farmer groups such as FBOs of ABCs targeted by the EAIN project and farmer field school groups
- Farmers who belong to the EAIN project rice farming interventions
- Farmer groups who belong to existing VSL associations/schemes and FSAs

Cluster farmers' roles would be to:

- Provide farmers with the group foundation to carry out business planning to step into value chain interventions as agribusinesses
- Provide foundation to function as a self-help group where members will voluntarily come together for mutual benefit and support to construct new ponds, rehabilitate existing ponds, harvest, etc.
- Act as members of a farmer field school through group learning and to access innovative training to adopt good management practices
- Serve as effective supply units for product consolidation for marketing activities by working together to organize their farm production, coordinating with one another to bring a consolidated supply to an agreed market
- Facilitate dissemination of market information to each member to improve farmers' access to markets
- Foundation to become a legal association or a cooperative that enables farmers to efficiently access credit, procure inputs, negotiate with buyers and business service providers, enter into business arrangements
- Decide on savings policies to operate a new savings scheme or to join in an existing savings scheme

Annex 2 Roles and responsibilities of Lead Farmer, Research Team, Breeder Farmer, and Working Group

Roles and Responsibilities of Lead Farmer

- Serve as breeder and or as a growout farmer to produce fingerlings and sell to farmers in cluster group and or to sell market size fish. Lead farmer will also offer technical support for two additional breeder farmers within each cluster farmer group
- Work closely with lead farmer connector and the Cluster Group Research Team (CGRT) to conduct learning activities, farmer-to-farmer field days, and demonstrations to disseminate technical knowledge.
- In close collaboration with the CGRT, provide guidance and technical support for peer farmers on an individual basis and through group meetings and learning activities
- Work closely with the CGRT to oversee and strengthen supply chain linkages (i.e. between input suppliers and the cluster group, such as with the Agricultural Business Centers (ABC) and the Makali hatchery).
- Following the development of a business plan and identification of market linkages, lead farmers should promote group engagement in marketing in order to develop close relationships between the farmers, traders, and buyers.
- In close partnership with the lead farmer connector and CGRT, lead farmer will contribute to monitoring the progress of the cluster group farmers, follow participatory M&E procedures, and will promptly report concerns and problems to the farmer connector who will in turn connect with a research assistant and seek additional support when necessary.
- Liaise with public sector and local technical service providers (i.e. Government extension officers, ABCs, and farmer field schools). The lead farmer and cluster farmers will also be encouraged to form and/or join farmer based organizations (FBOs) directly linked with the ABCs.
- Work with group to appoint a village savings leadership team of 2-3 peers in the cluster group to manage and keep records for the group's village savings and internal lending system
- Assist in coordinating 4-5 subgroups within each cluster group that will manage household or group microfinance loans or advanced credit through contract farming agreements. Peer accountability will be encouraged for transparency to ensure that farmers understand and accept the terms and conditions of any microfinance or contract farming agreement.
- Promote a self-help labor exchange system within the cluster group for construction of ponds, harvests, and maintenance activities
- Lead farmer will work with group to set short-term objectives and long-term goals, and will work to maintain group morale and participation. Lead farmer will also address specific issues with members, such as repeated absences from group meetings or activities, and when necessary refer such cases to the lead farmer connector.

Roles and responsibilities of Research Team

- Work closely with the Cluster Farmer Connector and the project Extension Coordinator

- Gather and organize information needed for business planning, including assessment of farming conditions and product supply capacity
- Assist in the identification and evaluation of market choices
- Conduct market visits and interview/talk to buyers to obtain information on the prices, marketing activities, costs and margins, and constraints and opportunities related to the movement of farmed fish
- Assist the Lead farmer to organize training and capacity building activities
- Assist the lead Farmer to disseminate information (technical and other) to fellow farmers in the group
- Organize farmer field school days and activities
- Assist the lead farmer to conduct farmer field school activities
- Assist the Lead farmer to prepare production and supply plans in a participatory manner
- Liaise with the breeder farmer to inform them the seed supply demand for the coming cycle
- Organize inter cluster committees, where necessary, to market the produce

Roles and responsibilities of Breeder Farmer

- Work closely with the Cluster Farmer Connector, Hatchery Consultant and the project Extension Coordinator
- Participate in a decentralized tilapia seed supply mechanism
- Maintain a tilapia brood fish and nursery ponds within the cluster
- Act as a fish seed supplier to the cluster farmers
- Determine the price of tilapia fry/fingerlings collectively
- Participate in farmer field school approach to disseminate breeding technologies to cluster farmers

Roles and responsibilities of the Working Group

- Work closely with the project Extension Coordinator (EC)
- Provide advice and assistance to the project on identifying locations of existing farmer groups
- Assist the project to link with existing farmer groups to assess them for the formation of project cluster farmer group
- Designate one representative from each participating institution in the WG who can assist in the above and make decisions regarding institutional support and to join regular meetings
- Assist the process to set up project cluster farmer groups
- Assist the cluster farmers to access inputs, including credit, and link to markets
- Bring the synergies of constituent institutions of the WG together for the benefits and functions of the cluster farmer groups
- Provide directions and advice on the access to external training opportunities

Annex 3 Cluster Farmer Connector roles and responsibilities

1. Provide adequate technical support for the WG for the formation of cluster farms, lead farmers to facilitate trainings, field days, and farmer-to-farmer learning exchanges.
2. Work closely with and oversee the Lead Farmer to provide technical assistance to cluster farmer groups in construction aquaculture ponds and maintenance, and throughout the production cycle adhere to the project's guidelines for economic and environmental viability.
3. Working closely with WG, promote gender equity through gender-balanced group composition and leadership, access to inputs and resources, technical support, and marketing opportunities.
4. Work with the lead farmer and RT to integrate gender transformative messaging within group trainings and learning activities.
5. Aim to have an in-depth understanding of their assigned community- its needs and strengths, and the needs and strengths of the individual farmers in the cluster group
6. Facilitate rigorous participatory monitoring and evaluation (M&E) for each group, including registration of participation in activities and meetings, Participatory Action Research (PAR) group discussions, a suggestion box for farmer feedback, evaluations of progress, trainings, and learning activities. The lead farmer connector will work closely with the M&E coordinator and research assistants for bi-weekly M&E reports to be entered into a central M&E database in Makeni and reviewed routinely by the team.
7. Partner with the business development specialist to work with the lead farmer, RT and cluster group to provide business development training, to build a business plan, identify market linkages, and promote continuous direct engagement by the farmers in the commercialization of their fish.
8. Provide assistance to relevant resource persons and specialists to deliver cluster farmers capacity building initiatives and assist them in participatory M&E and regular reflection learning events.
9. CFC will develop the capacity of the breeders and cluster farmers to oversee stringent quality and quantity control as desired for respective market (i.e. smoked fish at local market versus fresh fish sold at the city market)
10. Working closely with RT, provide financial education trainings and capacity building activities for the group about savings and borrowing, especially relating to the village savings and internal lending system and microfinance loans.
11. Support the lead farmer, RT and the village savings leadership team to promote financial accountability and transparency by groups and households
12. Strengthen linkages between the cluster group and the ABCs and Makali fish farm for access to inputs, to support FBOs, and to develop technical capacity.
13. Regular reporting and collaboration with the MFMR and MAFFS and the Ministry of Agriculture through monthly district NGO meetings and involvement in the INGENAES Network.
14. Submit bi-weekly work plans to the Extension Coordinator and Field Coordinator and maintain regular contact by mobile phone. The farmer connector will also be part of a community of practice e-platform (likely a WhatsApp group) through which he or she can submit technical and logistical questions and concerns for peer colleagues.

Additionally, the farmer connector may be requested to send GPS pins via Smartphone for accountability and safety reasons.

15. Cluster farmer connector will undergo compressive training and continuously will participate in courses about but not limited to increasing their technical aquaculture knowledge, extension competencies, gender and nutrition sensitivity in extension, monitoring and evaluation, financial and business development, and value chain and supply chain strengthening.

Annex 4 Project work plan and schedule

Project start-up

Since its start on October 2016, the SAP project has focused the first quarter on finalizing project strategy and management including human resource needs and logistical needs, budget, identification of potential partners, initial scoping of small lending institutions and value chain actors. An activity that successfully captured learning on how to direct the project's strategy was the development of the theory of change. The project initiated community entry and engagement to set up cluster farmer groups and developed draft roles and responsibilities of project staff and several project actors. Strategies and approaches for pro-poor business models to promote small-scale aquaculture in Sierra Leone were developed and a one-day workshop was held with the participation of a diverse group of stakeholders to inform them about the project objectives and implementation strategy and to receive feedback on the pro-poor business models. Technical support to Makali fish farm was continued to improve the broodstock and feed as they are *sine qua non* for the success of SAP project. The activities to collaborate with CRS Sierra Leone Entrepreneurial Agriculture for Improved Nutrition (EAIN) project were identified and communicated to CRS.

Project administration

The project administration and management, including Project Management and Field Management office set up, project personnel and management and implementation structures, is articulated in section 3.0 of this technical Proposal.

The project secured three vehicles and 10 motor bikes from ACIDI/VOCA Sustainable Nutrition and Agriculture Programme (SNAP) upon closure of the programme. The project is in possession of other office utilities used during the implementation of pilot project. WorldFish will also provide smart phones for communication and technology such as iPads to support the data collection and analysis process over the life of the project. The project will procure any materials needed according to WorldFish policies and procurement procedures.

Coordination

The SAP project will have regular reflection meetings with project staff to coordinate field activities as well as with partners for timely implementation of project activities. The Manager of the WorldFish-led project will serve as a steering committee member of the CRS EAIN project to ensure better coordination of identified activities with CRS project. The steering committee comprises a group of high-level staff from each partner agency and will meet monthly to coordinate implementation of activities. Targeting community groups under CRS EAIN project by SAP project as far as possible will enhance coordination between the two projects. The project Extension Coordinator will play the lead role in coordinating all project Cluster Farmer Connectors in the field and Cluster Farmer Connectors will coordinate implementation of cluster farmer group activities. SAP project will maintain links with the potential private partners as input suppliers and market actors through reaching out to them, and liaising with other projects and agencies to seek synergies between their activities and interventions implemented by the SAP project.

Communications and outreach

The primary audiences targeted by the project's communications strategy will be cluster farmers, private investors, ABCs, homesteads involved in fish farming or who have the potential to farm fish and fish value chain stakeholders. Secondary audiences are not direct participants, although they influence project activities with their role as decision makers, public opinion influencers and insurers of future sustainability of the project outcomes through policy

making and governance (e.g., policy makers and planners, government agencies, research organizations, NGOs, media, and USAID). Communications and outreach activities will achieve the following targets:

- Publish, disseminate and amplify high quality science and technical knowledge designed to foster growth of the aquaculture sector in Sierra Leone as an agribusiness and gain further support to amplify aquaculture as a business.
- Support policy and advocacy initiatives to promote sustainable growth of the aquaculture sector to improve the income, food and nutrition security of small-scale producers.
- Support training, especially for women and youth, through capacity development initiatives, and behaviour change communication to improve nutritional outcomes for women and children associated with increased supply of nutritious fish.

Project Close Out

The project will close out in a way that is responsive and accountable to participants, partners, local governments, and donors. Partners will work to develop a comprehensive, realistic project close out plan that details roles, responsibilities, timelines, and activities that reflect donor requirements. WorldFish will initiate the project close out process 12 to 6 months prior to the project end date depending on activities planned for the final year of the project. Effective project monitoring, documentation and storage procedures will be maintained to ensure compliance with USAID policies and regulations. WorldFish will submit a close out plan as per USAID close out procedures.

LOP implementation plan

Activity description					Focal staff/Unit	Partners
	FY1	FY2	FY3	FY4		
Intermediate Result 1: Improved Agricultural Productivity						
Sub Intermediate Result 1.1: Enhanced Human and Institutional Capacity Development for Increased Sustainable Agriculture Sector Productivity						
<i>Activity component 1: Test pro-poor business models to promote aquaculture as a profitable and responsible agribusiness to increase fish production and employment</i>						
<i>1.1 Formation of cluster farmer groups</i>						
Selection criteria for mapping of CFGs					ME&LC, EC	
Identify partner institutions to set up a WG & FT					PM, ME&LC, EC	
Setting up of the WG and FT with a MoU					EC, ME&LC	MAFFS, MFMR, Njala University, selected ABCs
Finalise roles and responsibilities of the WG & FT					PM, ME&LC, EC	MAFFS, MFMR, Njala University, selected ABCs
Functioning of the facilitating team					ME&LC, EC, CRA	
<i>1.2 Community entry, engagement, formation of CFGs & functional</i>						
Community entry & engagement to set up of initial CFGs					ME&LC, EC, CRA	MAFFS, MFMR, Njala University, selected ABCs
Formation of initial CFGs for FY17					ME&LC, EC, CRA	MAFFS, MFMR, Njala University, selected ABCs
Functional initial CFGs for FY17					ME&LC, EC	
Community entry & engagement to continue setting up CFGs for successive FYs					ME&LC, EC, CRA	MAFFS, MFMR, Njala University, selected ABCs
Formation of CFGs for successive FYs					ME&LC, EC, CRA	MAFFS, MFMR, Njala University, selected ABCs
Functional CFGs for successive FYs					ME&LC, EC	
Selection of LFs, BFs, CGRT for initial CFGs for FY17					ME&LC, EC, CRA	LF
Selection of LFs, BFs, CGRT for CFGs for successive FYs					ME&LC, EC, CRA	LF
Draft roles & responsibilities of LF, BF, CGRT & CFG					PM, ME&LC, EC	
Validate roles and responsibilities of LF, BF & CGRT & CFG with CFGs					ME&LC, EC, CRA	LF
<i>1.3 Designing of pro poor business models for CFGs</i>						
Strategies & approaches for pro poor business models					PL, PM, EC	
Designs of pro poor business models					PL, PM, EC	

Development & validation of business plans for CFGs					BPC, EC, CFC	LF
Sub Intermediate Result 1.2: Enhanced Technology Development, Dissemination, Management, and Innovation						
Activity component 2: Improve input supply with private sector participation						
2.1 Mapping of input suppliers & partners						
Identify initial private partners & ABC to promote as tilapia seed & feed suppliers					PM, EC	
Identify further private partners & ABC to promote as tilapia seed & feed suppliers					PM, EC, CFC	
Identify fertilizer and lime traders in Tonkolili					CFC	
Facilitate private partner agreement with MFMR to manage Makali fish farm for tilapia fingerling and feed production					PM	BIG, MFMR
2.2 Technical support to improve fish seed & feed development at Makali fish farm, ABCs and private partners						
Technical support to Makali fish farm to improve tilapia broodstock					HFC, MFS, CFC	BIG, MFMR,
Technical support to Makali fish farm to increase tilapia fingerling supply					HFC, MFS, CFC	BIG, MFMR, WARC
Improving tilapia feed formula and testing at Makali fish farm					HFC, MFS, CFC	BIG, MFMR
Technical support to BIG and WARC to commence and continue tilapia seed supply					HFC, CFC	BIG, WARC
Technical support BIG and WARC to commence and continue tilapia feed supply					HFC, CFC	BIG, WARC
2.3 Prepare input supply plans with distribution and access strategies						
2.4 Technical support to CFGs to start up & engage in tilapia seed production						
2.5 Prepare tilapia seed supply plans for CFGs						
					HFC, CFC	LF
Intermediate Result 2: Expanding Markets and Trade						
Sub-Intermediate Result 2.1: Improved Access to Business Development and Sound and Affordable Financial and Risk Management Services						
2.6 Facilitate access to financial services						
Mapping of financial service providers to small-scale farmers & existing VSL/SILC groups					PM, EC	MAFFS, CRS
Strengthen existing VSL/SILC groups or institute new VSL/SILC groups within CFGs					ME&LC, EC, CFC	
Link CFGs to MFIs or other financial services providing loans for small-scale farmers					EC, CFC	MFIs, CBs, FSAs in Tonkolili
Activity component 3: Develop strategies for marketing and market linkages for fish farmers and facilitate market access.						
3.1 Mapping of markets and market actors (input & output markets, potential buyers/traders, cold storage owners, processors, fish sellers associations)					PM, EC, CFC	

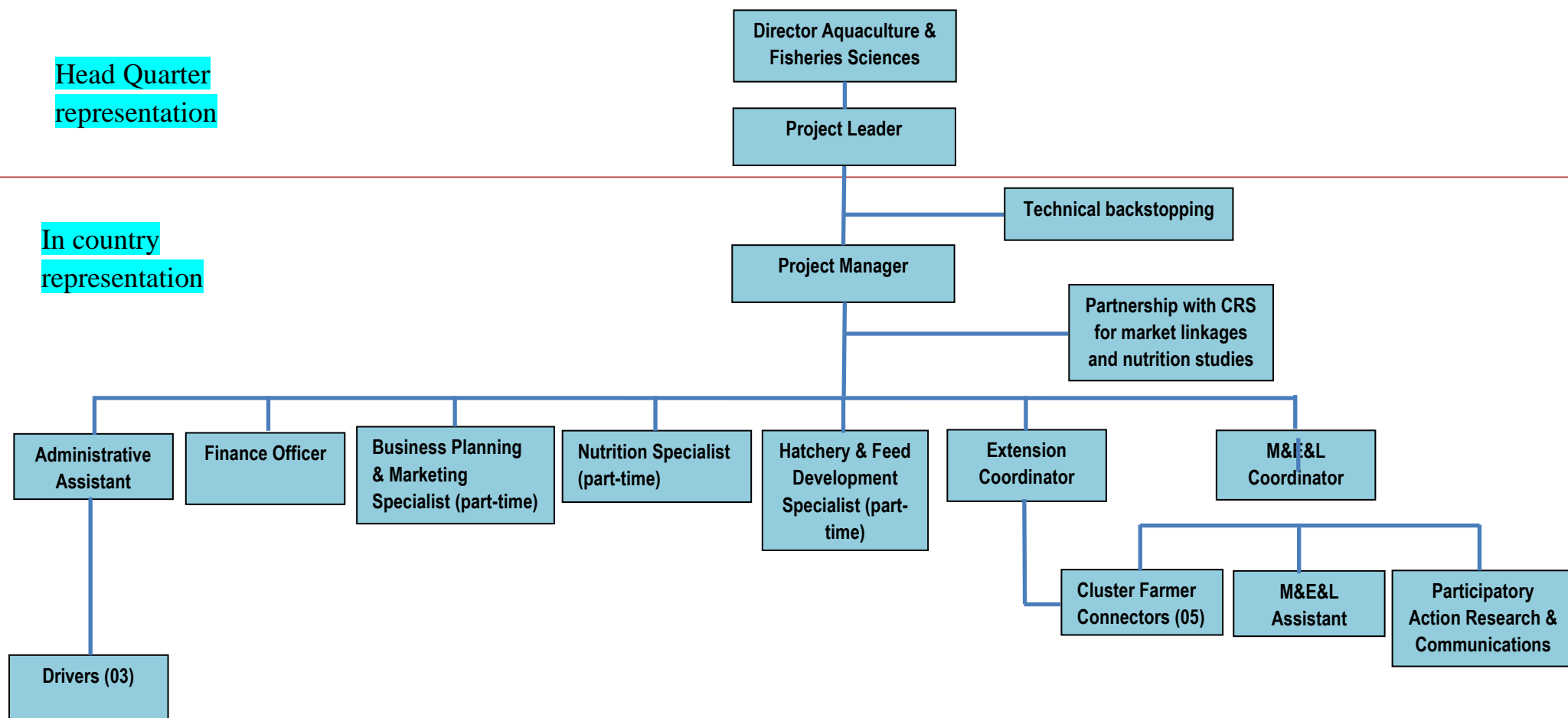
3.2 Develop market strategies for input and output market linkages					PL, PM, EC	In collaboration with CRS-ACDI/VOCA
3.3 Develop CFG based supply plans						
3.4 Develop market linkages & engage with market actors						
Engage with market actors					EC, CFC	
Facilitate linking CFGs to markets & market actors					EC, CFC	CSOs, FS, MTs, LF
Intermediate Result 7: Improved Nutrition-Related Behaviors						
<i>Activity component 4: Contribute towards behavior change communication to address fish consumption and hygiene issues.</i>						
<i>4.1 Gap analysis on existing SBCC material</i>					NS	CRS/HKI
<i>4.2 Development of additional fish consumption and hygiene SBCC materials for farmers, traders, processors & consumers</i>					NS	CRS/HKI
<i>4.3 Technical inputs to CRS-Spring-HKI to test and disseminate SBCC materials on fish consumption and hygiene</i>					NS	CRS/HKI
Intermediate Result 1: Improved Agricultural Productivity						
Sub Intermediate Result 1.1: Enhanced Human and Institutional Capacity Development for Increased Sustainable Agriculture Sector Productivity						
<i>Activity component 5: Build technical capacity among farmers and private sector to enter into and engage in commercial fish farming value chain</i>						
<i>5.1 Capacity needs assessment of staff and partners</i>						
Finalize initial capacity development plans for staff and partners					PM, ME&LC, EC.CFC	BIG, WARC
Continue capacity needs assessment for staff and partners					PM, ME&LC, EC.CFC	BIG, WARC
<i>5.2 Develop training tools for staff, partners and cluster farmers</i>					PM, HFC	
<i>5.3 Training of project staff and partners</i>					BPC	In collaboration with CRS
Training of project staff and partners on business planning & VSL/SILC					PM, HC, EC	In collaboration with INGENAES & Njala
Training of project staff & partners on aquaculture technologies, extension approaches					TBD	In collaboration with CRS
Training of project staff on group management and leadership					TBD	In collaboration with
Training of project staff & partners on contract farming						
<i>5.4 Training of CFGs</i>						
Training of CFGs on business planning & VSL/SILC					BPC, ME&LC, EC, CFC	LF
Training of CFGs on aquaculture technologies, extension approaches					HFC, EC, CFC	LF
Training of LFs & CFGs on group management and leadership					CFC	LF
Train CFGs on contract farming					CFC	LF

Farmer learning days					CFC, EC	LF
5.5 Technical and advisory support in Guinea					PL, PM	MF Guinea
Scoping visit to Guinea					PM, HFC	MF Guinea
Assistance to conduct an aquaculture assessment and prepare a plan of action					PM, HFC	MF Guinea
Technical assistance to start up tilapia brood stock development					PM, HFC	MF Guinea
Technical assistance to formulate suitable tilapia feeds and start up fish feed trials					PM, HFC	MF Guinea
Technical assistance to improve growout management practices					PM, HFC	MF Guinea
Activity component 6: Monitoring, Evaluation & Learning						
6.1 Finalize M&E&L strategy and plan with output/outcome indicators					PL, PM, ME&LC	
6.2 Finalize baseline					PL, PM, ME&LC	All partners
6.3 Annual technology assessments					EC	INGENAES
6.4 Reflection learning						
Monthly internal reflections with field staff					ME&LC, EC	
Quarterly reflection with all staff					ME&LC, EC	
Reflection learning with CFGs and partners					ME&LC, EC, CFC	MFS, BIG, WARC, LF
6.5 Knowledge sharing and learning platform						
Form knowledge sharing platform					PL, ME&LC, EC	
Hold knowledge sharing platform					ME&LC, EC	All partners
6.6 Monitoring and reporting						
Annual indicator monitoring						
Quarterly reporting					PL, PM	
Midterm review					PL, PM	
USAID Final Impact Evaluation and dissemination workshop					USAID, PL, PM	
6.7 Communication product development and dissemination					CRA, EC	All partners

ABC – Agriculture Business Centre; ACIDI/VOCA - Agricultural Cooperative Development International and Volunteers in Overseas Cooperative Assistance; BF – Breeder Farmer; BIG – Business Investment Group; BPC – Business planning consultant; CB – Community Bank; CFC – Cluster Farmer Connector; CFG – Cluster Farmer Group; CGRT – Cluster farmer group research team; CRA – Communications Research Assistant; CRS- Catholic Relief Service; CSO – Cold storage owners; EC – Extension Coordinator; FBO – Farmer based organisation; FS – Fish sellers association in Makeni; FSA – Financial Service Association; FT – Facilitating Team; HFC – Hatchery & Feed Development Consultant; HKI – Helen Keller International; LF – Lead farmer; MAFFS – Ministry of Agriculture, Forestry & Food Security; ME&LC – Monitoring, Evaluation and Learning Coordinator; MF – Ministry of Fisheries in Guinea; MFI – Micro finance institutions; MFMR – Ministry of Fisheries & Marine Resources; MFS – Makali fish farm staff; MT – Market traders in weekly and daily markets in Tonkolili; S – Nutrition Specialist; PL – Project Leader; PM - Project Manager; SILC – Savings and Internal

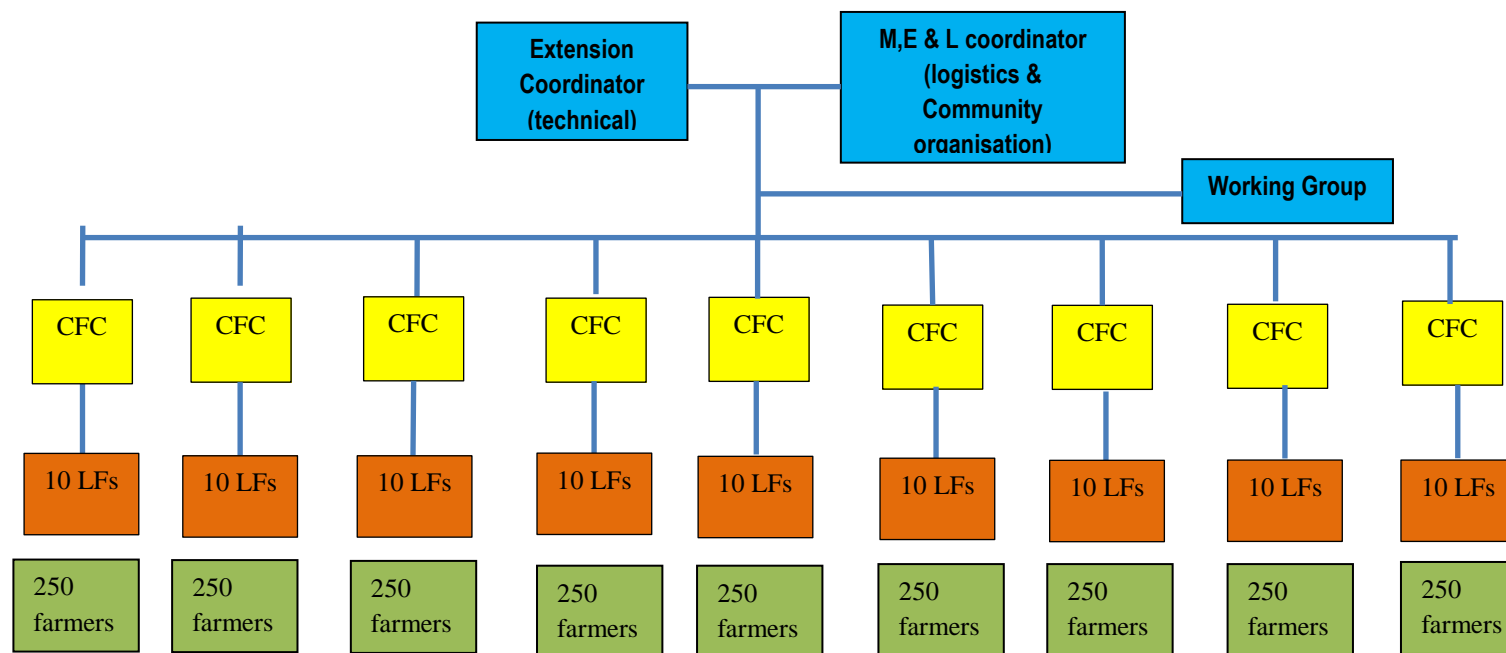
Lending Communities; TBD – To be determined; USAID – United States Agency for International Development; VSL – Village Savings and Loan schemes; WARC – West Africa Rice Company; WG – Working Group

Annex 5 FTF Sierra Leone Scaling up Aquaculture Production project management structure



M&E&L – Monitoring and Evaluation and Learning Coordinator

Annex 6 FTF Sierra Leone Scaling up Aquaculture Production project field implementation structure



CFC –Cluster Farmer Connector; LF – Lead Farmer

Annex 7 Technical expertise of key personnel

PROJECT LEADER STEVEN MICHAEL COLE

Key Technical expertise: Project leadership, gender, pro-poor project design and implementation, participatory action research, design and implementation of knowledge sharing and learning systems, scaling, inclusive stakeholder involvement, monitoring and evaluation, data analysis, mixed-methods

Key professional experience:

Designation and institution/project and time period	Summary of main duties and responsibilities
Gender Scientist (WorldFish, April 2013 to present)	Lead all gender transformative research activities in Zambia, lead participatory action research and gender research in Sierra Leone
Project leader (WorldFish, Feb 2015 to present)	Lead an aquaculture/nutrition project in northern Zambia funded by Irish Aid, design and supervision of all research activities (pro-poor business models that aim to increase smallholder access to seed/feed and capacity development for sustainable involvement in the aquaculture value chain), stakeholder involvement
Project leader, (WorldFish, March 2016 to present)	Lead a post-harvest fish processing technologies project in western Zambia funded by IDRC/ACIAR, design and implement gender and participatory action research and knowledge sharing and learning processes, data analysis, publication development
Aquaculture value chain assessment team member (social scientist), WorldFish, (Feb 2017 to present)	Team member on an EU-funded value chain assessment for development (VCA4D), with specific role of social and functional analysis

Regional and country experience: Zambia and Sierra Leone

Educational qualifications: PhD-Anthropology, MSc-Agricultural Economics, BS-Health and Nutrition

PROJECT MANAGER SUNIL NIRANJAN SIRIWARDENA

Key Technical expertise: 37 years of professional experience in aquaculture and inland fisheries development, management, research, education and training gained while employed at the Ministry of Fisheries in Sri Lanka (1979-1981), National Aquatic Resources Research and Development Agency (NARA) in Sri Lanka (1982 -2003), Institute of Aquaculture (IoA), University of Stirling in Scotland, UK (2004 - 2010), and working as an international consultant for international/intergovernmental agencies and institutions while working for NARA and IoA (1994-2016) such as FAO, UNDP, NACA (Network of Aquaculture Centres in Asia-Pacific), and WorldFish.

NARA is a statutory body directly under the Ministry of Fisheries and Aquatic Resources in Sri Lanka with vested responsibilities in research & development, management & conservation, and education & training on living and non-living aquatic resources.

Institute of Aquaculture is the largest global institution dedicated to aquaculture development renowned for its excellence in research, training and education and is designated an EU Large Scale Education and Research facility for excellence in aquaculture.

Key professional experience:

Designation and institution /project and time period	Summary of main duties/responsibilities
Project Manager for USAID funded Feed the Future Sierra Leone	Overall project management, technical guidance and implementation of project components, viz., farming systems and value chain assessments, integrated aquaculture-

<p>Agriculture project (WorldFish, August 2015 to present)</p>	<p>agriculture pilots, building capacity, and learning and scaling; preparation of work plans, budgetary allocations, progress reports and Terms of References for project staff and consultants; review of technical inputs by staff and consultants; building partnerships with NGOs, government ministries, and universities; establishment of collaborative links with other development projects and state and non-state actors; and establishment of WorldFish country office.</p>
<p>International Team Leader/Chief Technical Advisor for projects on Support to Fishery and Aquaculture Management in the Kyrgyz Republic and Towards Sustainable Development of Aquaculture and Fisheries in the Kyrgyz Republic. (FAO of the united Nations, 210-2015)</p>	<p>Institutional and local capacity building towards sustainable development of aquaculture and inland capture fisheries. Overall project management, technical guidance and implementation of project components, <i>viz.</i>, design and implementation of fisheries research and fisheries co-management mechanism and establishment of a fisheries research laboratory; establishment of fisheries associations; development of small-scale fish hatcheries and small fish feed mills with associations to improve fish seed and feed supply; training farmers and fishers, technical officers, researchers, scientists on aquaculture technologies and fisheries management; training counterpart personal on aquaculture development planning, and aquaculture extension; establishment of primary fish processing plants on private-public partnerships; development of an undergraduate curriculum on fisheries and aquaculture; development of a fisheries and aquaculture policy process; and design and implementation of a fish consumption promotion campaign and countrywide fish marketing survey.</p> <p>Duties also involved preparation of work plans, budgetary allocations, progress reports and Terms of References for project steering committee (PSC), project staff and consultants; financial progress monitoring; review of technical inputs by staff and consultants; establishment of collaborative links with other development projects and state and non-state actors.</p>
<p>Research Fellow of the Scottish Government sponsored projects on Sustainable Utilisation of Aquatic Resources for Poverty Reduction through Education and Training and Entrepreneurship Development in Aquaculture in Malawi (Institute of Aquaculture, University of Stirling, UK, 2006-2010)</p>	<p>Technical and scientific advice to implement the projects. Duties involved were plan and execution of project activities aimed at capacity building of educational and vocational institutions on fisheries and aquaculture management in Malawi. Contributed to undergraduate curriculum development and training activities. Designed and implement surveys on fisheries and aquaculture development and management.</p>
<p>Associate Senior Consultant (Stirling Aquaculture, University of Stirling, UK, 2004-2006)</p>	<p>Review outputs of research and development projects and programmes on fisheries and aquaculture, preparation of policy briefs towards the management and development of aquatic resources sector and providing technical advice for the clients of Stirling Aquaculture. Comprehensive reviews on water resources, water scarcity, and aquaculture and fisheries development needs.</p>
<p>Director General (National Aquatic Resources Research and Development Agency (NARA), Sri Lanka, 2003)</p>	<p>Overall management and supervision of nine technical divisions of the agency, which included project formulation for research on management, conservation and development of aquatic resources; plan and implementation of education, training and extension programmes; securing national and international funding to address national and industrial needs; and review, monitor and evaluate progress. Ensured necessary technical expertise for policy and legal framing in aquatic resources development, conservation and management.</p>

	Management also involved administrative functions of the agency with a staff of 377 and acted as a member of the Governing Board.
Senior Technical Advisor for Aquaculture Development in Northern Uplands in Vietnam. (FAO/UNDP of the United Nations, 2002) (while on sabbatical leave from NARA)	Management and implementation of project activities for poverty reduction and enhancement of local food security among the poor upland ethnic communities through small-holder aquaculture development programmes. Duties were to increase productivity of small-holders aquatic production with active participation of the ethnic upland communities, extensionists, scientists and academics; establishing network of an efficient and participatory system of aquaculture extension services, improving local availability of quality fish seed through decentralised seed production systems; and developing a micro credit scheme to provide credit through a community managed scheme.
Head/Inland Aquatic Resources and Aquaculture Division (NARA, Sri Lanka, 1997-2002) Senior Research Officer (Supra Grade) (NARA, Sri Lanka, 1990-1997)	Appropriate research towards management, conservation and development of aquaculture and inland fisheries; plan and implementation of aquaculture and inland fisheries development actions; expertise inputs for policy and legal framing for aquaculture management; ensure implementation and monitoring of the Division's research, development and extension programmes; and administrative functions, including budget allocation, of the Division and three Regional Research Centers of NARA.
Research Officer (NARA, Sri Lanka, 1982-1990)	Overall responsibility was to ensure appropriate research on coastal shrimp aquaculture management. Main duties were coordination of Regional Research Centres of NARA including project formulation, implementation, monitoring and general administration; assessment of the aquaculture industry for certification; preparation of zonal plans for aquaculture development; and formulation and implementation of extension, training and awareness programmes..
Research Officer and Project Officer (Research Division, Ministry of Fisheries, Sri Lanka, 1979-1982)	Functioned as the Project Officer for the International Development Research Centre (IDRC) sponsored Fish Cage and Fish Pen Culture Research Project. Conducted cage and pen culture research trials with tilapia and milkfish and surveys on topography of lagoons and lakes in Sri Lanka.

Regional and country experience:

West Africa (Sierra Leone), Southeast Africa (Malawi), Central Asia (Kyrgyz Republic), South Asia (Sri Lanka, India, Bangladesh), Southeast Asia (Vietnam), Southwest Asia/Western Asia (Oman, Iraq – worked from Jordan), Eastern Europe (Latvia), and Western Europe (United Kingdom).

Educational qualifications:

Ph.D in Aquaculture, Institute of Aquaculture, University of Stirling, Scotland, UK (1990 to 1993).

M.Sc. in Aquaculture and Fishery Management, Institute of Aquaculture, University of Stirling, Scotland, UK (1986 to 1987).

B.Sc (Special) in Zoology (subsidiary - Chemistry), University of Colombo, Sri Lanka (1974 to 1978).

**EXTENSION COORINATOR
COLBY SILVERT**

Key Technical expertise:

Specializing in agricultural extension programming and knowledge sharing and learning systems for smallholder farmers, with background in a range of technical agricultural production systems (i.e. aquaculture, export high value fruit, diversified vegetable and smallholder coffee). Interested in design and coordination of extension systems for smallholder farmers to link with high value markets.

Key professional experience:

Designation and institution/project and time period	Summary of main duties and responsibilities
Project Extension Coordinator/Consultant WorldFish Sierra Leone/ Scaling up Aquaculture Production Project (June 2016-present)	<ul style="list-style-type: none"> ▪ Developing an extension curriculum and training modules for market-driven extension to test pro-poor business models for semi-intensive sustainable tilapia production ▪ Providing key coordination and technical support for field staff, junior extension officers and lead farmers ▪ Capacity building of local, public, and private sector extension advisory services to partner with cluster farmer groups to provide technical assistance and extension services ▪ Supporting research and learning to refine and test extension approaches
In-country Project Specialist University of Illinois/INGENAES Project Sierra Leone (June 2016-present)	<ul style="list-style-type: none"> ▪ Promoting and piloting agricultural extension approaches and technologies for smallholder farmers, aiming to improve nutrition and promote gender equity and empowerment ▪ Strengthening an over 50-year partnership between the University of Illinois and Njala University in Sierra Leone ▪ Coordinating and providing technical support for the INGENAES extension network ▪ Facilitating academic and learning exchange with Njala U, the U of Illinois, and Feed the Future Projects in Sierra Leone
Student Research Grantee US Fulbright Program/CAPES Brazilian Study and Research (February 2015-May 2016)	<ul style="list-style-type: none"> ▪ Received funding for a study in Minas Gerais Brazil to evaluate smallholder farmer access to certified coffee markets based on the following areas of inquiry: <ul style="list-style-type: none"> ○ Production systems and technical resources ○ Economic circumstances and constraints ○ Farmer organization and engagement in commercialization ▪ Conducted interviews with farmers, cooperative administrators, and representatives from the public, private, and NGO sectors ▪ Worked in partnership with Dr. Ricardo H.S. Santos at the Federal University of Viçosa in Minas Gerais, Brazil
Viticulture Research Intern E&J Gallo Winery (July 2014-December 2014)	<ul style="list-style-type: none"> ▪ Conducted research to track fruit maturity, determine harvest times, and support precision agriculture innovations ▪ Worked with grape farmers to provide and benefit from a partnership with the world's largest wine company

Regional and country experience:

Brazil, Colombia, Dominican Republic, New Zealand, and Sierra Leone

Educational qualifications:

BS in Crop Sciences Horticulture, the University of Illinois at Urbana-Champaign (2014)

MONITORING AND EVALUATION AND LEARNING COORDINATOR MUSA ADANA BRAIMA

Key Technical expertise: Six years of specialized skills in project monitoring and evaluation, knowledge management, sharing and learning (specifically for nutrition and Food security interventions). Highly knowledgeable in promoting accountability in project implementation. In addition, five years working with Village savings and Loan Groups on group dynamics, leadership, bookkeeping and linkages to micro-finance institution.

Key professional experience:

Designation and institution/project and time period	Summary of main duties and responsibilities
Design, Monitoring and Evaluation Team Leader (CARE International in Sierra Leone-Country Office, November 2013-January 2017).	<ul style="list-style-type: none"> • Coordinated DM&E activities at country office level • Led the setting up of a coherent and robust integrated portfolio at project level and ensure high quality implementation of that system. • Supervised, mentor and coach M&E staff in the country office. • Led project reflective practice exercises and ensure program quality • Participate in design, monitoring and evaluation of all projects and partner organizations. • Lead need assessment processes using both quantitative and qualitative approaches • Facilitated country office program knowledge management, sharing and institutional learning • Liaised with Government and other partners on M&E activities
Design, Monitoring and Evaluation Advisor (CARE International in Sierra Leone-Sub Office, January 2011-October 2013)	<ul style="list-style-type: none"> • Coordinated all DM&E activities at the sub office level • Contribute to setting up a coherent and robust integrated portfolio at project level and ensure high quality implementation of that system. • Ensure DM&E norms and standards are observed at sub office level health initiatives to produce high program quality. • Formed and worked with VSLA groups • Facilitate District program knowledge management, sharing and institutional learning • Collected information on nutrition related indicators
Chiefdom Supervisor-Window of Opportunity (CARE International in Sierra Leone, January 2009-December2010).	<ul style="list-style-type: none"> • Project planning, implementation & monitoring • Stakeholder coordination at chiefdom level • Facilitate technical support for mother to mother support group facilitators • Collect nutrition indicator data, compile, analyse and write reports • Collaboration with District Health Management Team • Monitor Village Savings and Loan Association activities • Provide timely and accurate monthly report to contribute to quarterly reports • Participate in project reflective processes

Regional and country experience:

Spent ten years in Guinea and worked with UNHCR in the following sectors, shelter, latrines, and agriculture. Attended workshops and seminars in Benin, Ghana, Ivory Coast and Liberia. Worked with CARE international in the northern region of Sierra Leone (Tonkolili, Bombali, Koinadugu & Kambia districts) for fifteen years.

Educational qualifications:

Bachelor of Science in Education (NUC), seminars and workshops in Monitoring & Evaluation, Training in participatory approaches, facilitative skills and community mobilizations- Village Savings and Loan Associations, Leadership and Team building etc.

Annex 8 Roles and responsibilities of the project staff

PROJECT MANAGER

Main roles and responsibilities

- Provide technical guidance and manage implementation of the WorldFish/ USAID Feed the Future project in Sierra Leone according to the project scope.
- Develop activity-level work plans and budgets, monitor progress against project objectives and milestones, draft project reports, provide regular updates, and identify and alert potential risk factors to Project Leader and other relevant parties.
- Ensure effective and efficient day-to-day operations of the project, including exceptional financial tracking and reporting with the highest integrity, alignment and accountability for quality in WorldFish systems and procedures.
- Identify and contract, where necessary, and supervise the local office team to support implementation.
- Identify, contract, and supervise technical teams and consultants for implementation of the project components.
- Technically review the national and international consultants' mission reports and other documents produced (e.g. training materials and research reports) before submission to the Project Leader, ensuring that all reports, manuals and other documentation prepared by consultants are of high quality.
- Identify and contract, where necessary, and coordinate with partners for implementation of relevant components of the project.
- Provide technical guidance and support and capacity building to national staff and partners in setting up and implementing effective systems for project administration, documentation, storage and analysis of data collected by projects and in preparing written materials.
- Represent WorldFish at external meetings and consultations and ensure that the project's objectives and outputs are communicated appropriately.
- Provide general procedural guidance to the government and other national partners in Sierra Leone in designing and implementing specific research and development projects and provide technical inputs where appropriate.
- Prepare reports on progress as required for WorldFish and USAID.

MONITORING, EVALUATION AND LEARNING COORDINATOR

Main roles and responsibilities

- Oversee the USAID Feed the Future monitoring and evaluation and learning (M&E&L) system for the project in Sierra Leone and ensure appropriate links to the project activity programme outputs.
- Provide support and capacity building to national staff and partners in setting up and implementing the M&E&L system.
- Lead baseline, midline and end-line surveys on performance indicators.
- Perform annual monitoring of performance indicators.
- Provide expert guidance and support to project staff in documentation of the project M&E&L systems in accordance with the USAID Feed the Future requirements.
- Maintain records on the application of M&E&L tools applied within the project.

- Maintain up to date M&E&L databases.
- Prepare quarterly and annual key indicator progress reports and narratives.
- Lead the monthly and quarterly reflection workshops with staff and ensure the reflection processes set up at community-level by staff obtain the necessary and relevant information to capture key outcomes, successes, challenges and any unintended or negative outcomes.
- Provide general procedural guidance to government and other national partners in designing and implementing specific research and projects activities.
- Provide support to management of the project field activities in Tonkolili District. Specifically:
 - Cluster farmer group formation
 - Formation of functional savings and internal savings and/or village savings and loaning mechanisms within cluster farmer groups
 - Linking cluster farmer groups to micro finance suppliers
 - Linking cluster farmers to input suppliers
 - Develop activity-level work plans and budgets, monitor progress against project objectives and milestones, and identify and alert potential risk factors to Project Leaders and other relevant parties.
 - Ensuring gender and nutrition is integrated into all project activities

Planning, reporting and finance

- In collaboration with the Extension Coordinator prepare budgets for all field activities and office maintenance on monthly basis in advance and send the requests to Finance in Freetown Office.
- In consultation with the project Extension Coordinator and field staff establish monthly work plans and other relevant timeframes for field work.
- Provide technical reports on project activities on a monthly basis, or as otherwise required.
- Work closely with the project Administrative Assistant to ensure all vehicle logbooks are up to date and monitor the cash advance with the filling station in Makeni for timely replenishment.

Troubleshooting

- Resolve administrative issues relating to travel, accommodation, security issues etc. through appropriate channels and report back to the Project Manager
- Troubleshoot any problems with fieldwork, reporting back to the Project Manager.

EXTENSION COORDINATOR

Main roles and responsibilities

- In close collaboration with the Working Group and/or relevant local government institutions and NGOs take the lead in identifying community groups to form cluster farmer groups for project interventions.
- Take the lead in formation of cluster farmer groups to scale up fish production.
- Engage cluster farmers with market chain actors, including microcredit and small loan suppliers and input suppliers.

- Coordinate all training activities conducted by consultants, resource persons and CRS for the project staff, cluster farmers and value chain partners.
- Provide leadership in working with local leaders, local institutions, advisory and planning groups to develop understanding and support for all project extension activities.
- Develop farmer field school approach and/or Model farming village concept for cluster farmer learning, and encourage collaboration between public and private sector extension actors
- Coordinate all reflection learning events, together with M&E Coordinator, with special emphasize on women participation.
- Establish and manage a system to supervise and provide adequate support to Cluster Farmer Connectors for effective delivery of technical assistance and training to cluster farmers.
- Provide leadership in working with cluster farmer groups and partners to implement project activities, and implementing the project extension strategy/framework.
- In cooperation with the project staff, organize and maintain an effective extension capacity needs assessment plan to ensure implementation of a comprehensive, representative extension training module and program which meets the needs of project objective and results.
- In close collaboration with the Communications Research Assistant coordinate public relations activities with mass media, other government agencies and civic groups as appropriate, to develop a positive image of extension in the community.
- Identify activities of INGENAES with Njala University and the University of Illinois relevant to project objective and results, and incorporate the project staff, cluster farmers and the value chain partners in such activities.
- Assist the Monitoring, Evaluation and Learning Coordinator to collect data relevant to project progress monitoring indicators from the field, including monthly progress reports by Cluster Farmer Connectors.

Planning, reporting and finance

- Provide inputs to monthly workplans and other relevant timeframes for project activities.
- Assess monthly workplans of Cluster Farmer Connectors for adequacy.
- Provide technical reports on extension activities on a monthly basis, or as otherwise required.

Troubleshooting

- Troubleshoot any problems with fieldwork, reporting back to the Project Manager.
- Respond to concerns or issues reported by Cluster Farmer Connectors.

Other duties

- Perform other related duties relevant to the role as may be assigned by the Project Manager.

HATCHERY AND FEED DEVELOPMENT SPECIALIST

Main roles and responsibilities

- Determine actual demand of tilapia fry and fingerlings by cluster farmers based on available information.

- Design suitable pond based tilapia breeding techniques and an indoor tilapia eggs incubation system.
- Finalise the equipment and material with specifications required to set up tilapia on-farm breeding technologies at Makali Fish Farm and with cluster farmer groups, and indoor tilapia egg incubation system.
- Estimate tilapia broodstock and fingerling requirements, and prepare fingerling production plans to meet production targets of Feed the Future Sierra Leone Scaling up Aquaculture Production.
- Set up operational on-farm tilapia breeding programme with cluster farmer groups to meet the fingerling demand by project cluster farmer groups.
- Design and implement tilapia brood stock programme at Makali Fish Farm to improve the genetic quality.
- Design and implement a training programme to train cluster farmers on GMPs on growout farming and selected cluster farmers as breeders and fry to fingerling rearers.
- Design small fish feed preparation mills for small-scale farmers as well as potential private sector investors.
- Formulate suitable broodstock, starter and out grower tilapia feeds, including estimated production costs, using farmer accessible ingredients and demonstrate fish feed production.
- Design and implement a training programme to train selected cluster farmers as fish feed producers and provide technical expertise for private sector partners to become fish feed producers.
- Provide technical expertise to private sector partners to step into fish breeding and fingerling supply.

NUTRITION SPECIALIST

Main roles and responsibilities

- Identify gaps within the existing Social and Behaviour Change Messaging (SBCC) materials to promote fish consumption and to address hygienic issues related to fish consumption.
- Identify additional materials required focusing on elements of fish consumption and hygienic issues related to fish consumption.
- In collaboration with SPRING/HKI, identify entry points along the fish value chain to develop SBCCs to promote fish consumption to address hygienic issues related to fish consumption.
- In collaboration with SPRING/HKI, develop critical questions for households, actors/stakeholders along the fish value chain as a basis to develop SBCCs to promote fish consumption to address hygienic issues related to fish consumption.
- In collaboration with SPRING/HKI, develop SBCC approaches and draft SBCCs to promote fish consumption to address hygienic issues related to fish consumption to project participant households and various actors along the fish value chain.
- In collaboration with SPRING/HKI, test SBCC approaches and validate the draft SBCCs to promote fish consumption to address hygienic issues related to fish consumption with relevant stakeholders and participants households of the project.
- In collaboration with SPRING/HKI, disseminate validated SBCCs to promote fish consumption and to address hygienic issues related to fish consumption to various actors along the fish value chain.

- Train project staff on SBCC approaches and to disseminate the SBCCs to promote fish consumption to address hygienic issues related to fish consumption to various actors along the fish value chain.

BUSINESS PLANNING AND MARKET CHAIN ANALYSIS SPECIALIST

Main roles and responsibilities

- Train project CFCs in the preparation of tilapia aquaculture business plan for project cluster farmer groups, including, but not limited to, the following:
 - Product selection and supply assessment based on the preselected product
 - Cluster production plan and production module development, including costs and returns with financing plan
 - Cluster supply plan to show total quantity of the product that the cluster is capable of producing and consolidating for their collective marketing
 - Collective marketing plan including how to calculate marketing costs and income
 - Record keeping
- Guide the trained cluster farmers to train a selected cluster farmer group to prepare a business plan for the cluster.
- Provide guidelines to CFCs to train the cluster farmers to monitor their own business plan along the value chain.
- Based on the learnings in the field prepare a toolkit to prepare tilapia aquaculture business plans for future cluster farmer groups.
- Carryout a market chain analysis and identify markets and market linkage strategies for cluster farmers
- Submit a comprehensive technical report covering above aspects and recommendations to strengthen capacities of the project CFCs and cluster farmers.

COMMUNICATIONS RESEARCH AND DEVELOPMENT RESEARCH ASSISTANT

Main roles and responsibilities

- Update and support the implementation of the WorldFish Project communication strategy in consultation with Head of WorldFish Communications and marketing which will involve behavioral change approaches as well as wider advocacy.
- Provide administrative support for and assist in the development of products which might include posters; flyers; public service announcements; policy documents; working papers; project reports; newspaper/magazine articles etc. aimed at different target audiences (e.g. donors, policy makers, local community members, the poor, marginalized, and women).
- Maintenance of the media relations contact list/database and support countrywide media relations.
- Maintenance of the partners contacts list/database.
- Assist in the provision of metrics on the effectiveness of communication tools for bringing about change.
- Provide support to the Monitoring, Evaluation and Learning Coordinator and the Extension Coordinator to meet the communications objectives within monitoring and evaluation mechanism of the project.
- Liaise with WorldFish regional office and HQ to ensure adherence to institutional norms for example branding; publication templates; knowledge management etc.

- Working closely with the Makeni field office staff, track what on-the-ground success or project activities are underway and prepare short reports with photographs.
- Propose potential stories and content for social media channels to be shared via the WorldFish corporate channel.
- Redraft technical reports into easy-to-read articles for the websites and parties of interest.

Planning, reporting and finance

- Provide inputs to monthly workplans and other relevant timeframes for project activities.
- Provide technical reports on communication activities on a monthly basis, or as otherwise required.

Troubleshooting

- Troubleshoot any problems with fieldwork, reporting back to the Project Coordinator and the Communication Specialist.

Other duties

- Perform other related duties as may be assigned by the Project Manager.

MONITORING, EVALUATION AND LEARNING ASSISTANT

Main roles and responsibilities

- Assist the project Monitoring, Evaluation and Learning Coordinator to:
 - Oversee the USAID Feed the Future monitoring and evaluation and learning (M&E&L) system for the project in Sierra Leone and ensure appropriate links to the project activity programme outputs.
 - Provide support and capacity building to national staff and partners in setting up and implementing the M&E&L system.
 - Lead the monthly and quarterly reflection workshops with staff and ensure the reflection processes set up at community-level by staff obtain the necessary and relevant information to capture key outcomes, successes, challenges and any unintended or negative outcomes.
 - Perform annual monitoring of performance indicators.
- Under the guidance of Monitoring, Evaluation and Learning Coordinator participate actively in baseline, midline and end-line surveys on performance indicators.
- Under the guidance of Monitoring, Evaluation and Learning Coordinator assist project staff in documentation of the project M&E&L systems in accordance with the USAID Feed the Future requirements.
- Maintain records on the application of M&E&L tools applied within the project.
- Maintain up to date M&E&L databases.
- Prepare quarterly and annual key indicator progress reports and narratives and submit to Monitoring, Evaluation and Learning Coordinator for approval.
- Work closely with the project Extension Coordinator and Cluster Farmer Connectors to collect the data on following activities as part of monitoring process.
 - Cluster farmer group formation
 - Household data of cluster farmers and gender disaggregation
 - Trained and operational on-farm breeders and gender disaggregation

- Cluster farmer research Team members and gender disaggregation
- Formation of functional savings and internal loaning and/or village savings groups within cluster farmers.
- Linking cluster farmers to input suppliers, input supply partners and input supply records
- Linking cluster farmer groups to micro finance suppliers, types of microcredit and loan suppliers and amounts of microcredit and loans
- Number of business plans developed, private business partners and nature of partnerships
- Production data and area under aquaculture activities due to project interventions
- Types and number of social and behavior change communication material developed and disseminated.
- Direct and indirect beneficiaries of the project
- Ensuring sex-disaggregated data (and other disaggregated data as appropriate) are collected. Helping ensure gender and nutrition are adequately being integrated into project activities through regular monitoring and evaluation.
- Any other data that may be deemed necessary to monitor the project progress

Planning, reporting and finance

- Provide monthly workplans and other relevant timeframes for monitoring, evaluation and learning activities to the project Monitoring, Evaluation and Learning Coordinator and the project Extension Coordinator.
- Provide technical reports on project activities on a monthly basis, or as otherwise required.

Troubleshooting

- a. Troubleshoot any problems with fieldwork, reporting back to the project and Monitoring, Evaluation and Learning Coordinator and project Extension Coordinator.

Other duties

- Perform other related duties as may be assigned by the project Field Coordinator.

CLUSTER FARMER CONNECTOR

Main roles and responsibilities

- Provide adequate technical support for the (Working Group) WG for the formation of cluster farmer groups, lead farmers to facilitate trainings, field days, and farmer-to-farmer learning exchanges.
- Work closely with and oversee the Lead Farmer to provide technical assistance to cluster farmer groups in constructing aquaculture ponds and maintenance, and throughout the production cycle adhere to the project's guidelines for economic and environmental viability.
- Working closely with WG, promote gender equity through gender-balanced group composition and leadership, access to inputs and resources, technical support, and marketing opportunities.
- Work with the lead farmer and cluster farmer RT to integrate gender transformative messaging within group trainings and learning activities.

- Aim to have an in-depth understanding of their assigned community- its needs and strengths, and the needs and strengths of the individual farmers in the cluster group
- Facilitate rigorous participatory monitoring and evaluation and learning (M&E&L) for each group, including registration of participation in activities and meetings, Participatory Action Research (PAR) group discussions, a suggestion box for farmer feedback, evaluations of progress, trainings, and learning activities. The cluster farmer connector will work under the supervision of the M&E&L coordinator for monthly M&E&L reports to be entered into a central M&E database in Makeni and reviewed routinely by the team.
- Partner with the business development specialist to work with the lead farmer, cluster farmer RT and cluster group to provide business development training, to build a business plan, identify market linkages, and promote continuous direct engagement by the farmers in the commercialization of their fish.
- Provide assistance to relevant resource persons and specialists to deliver cluster farmers capacity building initiatives and assist them in participatory M&E and regular reflection learning events.
- Cluster Farmer Connector will develop the capacity of the breeders and cluster farmers to oversee stringent quality and quantity control as desired for respective market (i.e. smoked fish at local market versus fresh fish sold at the city market)
- Working closely with cluster farmer RT, provide financial education trainings and capacity building activities for the group about savings and borrowing, especially relating to the village savings and internal lending system and microfinance loans.
- Support the lead farmer, cluster farmer RT and the village savings leadership team to promote financial accountability and transparency by groups and households
- Strengthen linkages between the cluster farmer group and the ABCs and Makali fish farm for access to inputs, to support FBOs, and to develop technical capacity.
- Regular reporting and collaboration with the MFMR and MAFFS through monthly district NGO meetings and involvement in the INGENAES Network.
- Submit monthly work plans to the Extension Coordinator and Monitoring, Evaluation and Learning Coordinator and maintain regular contact by mobile phone. The Cluster Farmer Connector will also be part of a community of practice e-platform (likely a WhatsApp group) through which he or she can submit technical and logistical questions and concerns for peer colleagues. Additionally, the Cluster Farmer Connector may be requested to send GPS pins via Smartphone for accountability and safety reasons.
- Cluster Farmer Connector will undergo compressive training and continuously will participate in courses about but not limited to increasing their technical aquaculture knowledge, extension competencies, gender and nutrition sensitivity in extension, monitoring and evaluation, financial and business development, and value chain and supply chain strengthening.

Planning, reporting and finance

- Provide monthly workplans and other relevant timeframes for field work to the project Monitoring, Evaluation and Learning Coordinator through project Extension Coordinator.
- Provide technical reports on project activities on a monthly basis, or as otherwise required.

Troubleshooting

- Troubleshoot any problems with fieldwork, reporting back to the project Monitoring, Evaluation and Learning Coordinator and project Extension Coordinator.

Other duties

- Perform other related duties as may be assigned by the project Field Coordinator.

FINANCE OFFICER**Main roles and responsibilities**

- Manage financial records, bank accounts and monthly reconciliations
- Manage account receivables and account payables
- Manage the project imprest account and prepare monthly expenditure records ensuring that the expenditures are justified in accordance with the relevant provisions of the financial authorizations
- Maintain receipts and invoices of all expenditures incurred and submit copies, together with the expenditure report to WorldFish;
- Monitor balance sheet accounts like staff advance, deposit account and prepayment account
- Prepare payments and post transactions in OCS
- Prepare monthly liquidity projections
- Perform all banking related tasks and verify all vouchers number, account and budget codes.
- Work in collaboration with the project Administrative Assistant to ensure procurement and settlement of all invoices done in a timely manner.
- Filing of documents in an easy retrievable manner
- Perform any other duties relevant to the Finance Officer's role to ensure successful implementation of the project

ADMINISTRATIVE ASSISTANT**Main roles and responsibilities**

- Establish and oversee office administrative procedures, including staff leave and attendance, according to organization policy and guidelines, and information management, including financial, personal, calendars and record keeping, and ensure effective communication and knowledge sharing between project partners.
- Manage office inventory and provide general purchasing administration support for the office, including price sourcing & transportation of goods arrangement, and ensuring sourcing, purchases, and inventory are according to organization's policy and guidelines.
- Provide logistics support to WorldFish staff, consultants and visitors including travel planning coordination (transportation and accommodation), management, setup, and preparing funds for field trip budgets

- Supervise disbursement of petty cash, funds held for partners and verifying staff and partner acquittals, and ensure advances and receivables with staff are liquidated on a timely basis.
- Assist in planning, coordination and setup of conferences, workshops, training courses, field days and other such activities related to the work plan and project office.
- In collaboration with the Finance Officer process all travel claims and work related funds requests for payment.
- In close collaboration with the Finance Officer conduct customs clearances for all imports for WorldFish and obtain visas for all visiting persons as required.
- Assist the Project Manager in preparation of contracts and MoUs
- Provide administrative support for field missions.
- Ensure the vehicle logbooks and maintenance records and drivers' movement register are properly maintained. Prepare monthly records of vehicle movement and fuel consumption for Project Manager's approval.
- Prepare and supervise daily schedule for office assistants
- Perform other related duties as may be assigned by the Project Manager

Annex 9 Branding and marking plan

BRANDING STRATEGY

A. POSITIONING

(1)WHAT IS THE INTENDED NAME OF THIS PROGRAM, PROJECT, OR ACTIVITY?

Feed the Future Sierra Leone Scaling up Aquaculture Production Project with acronym SAP Project.

(2)WILL A PROGRAM LOGO BE DEVELOPED AND USED CONSISTENTLY TO IDENTIFY THIS PROGRAM?

No separate project logo will be developed. The Feed the Future, USAID, and WorldFish logos and taglines will be used in line with USAID branding and marking guidance to ensure all parties are recognized appropriately.

Please see the logos that will be used below:



B. PROGRAM COMMUNICATIONS AND PUBLICITY

(1)WHO ARE THE AUDIENCES FOR THIS PROJECT OR PROGRAM?

The primary audiences are the poor small-scale aquaculture farmers with assets consisting of 3,000 farming households in Tonkolili District, Sierra Leone and actors all along the fish value chains, including SMEs, input suppliers, micro credit suppliers, market actors, cold storage owners and processors, fish sellers associations and smallholder farmer groups. The secondary audiences are non-targeted farming households and community members, the local government, private sector, and other development agencies operating in the zone of intervention and policy makers and planners.

(2)WHAT COMMUNICATIONS OR PROGRAM MATERIALS WILL BE USED TO EXPLAIN OR MARKET THE PROGRAM TO BENEFICIARIES?

WorldFish will produce a fact sheet/brochure about the project in electronic and hard copy versions, a press release and write success stories and case studies, and project snapshots that will be posted on the WorldFish and USAID websites. The FtF Sierra Leone SAP Project's USAID AOR will be consulted prior to posting any project publications on implementer

website. At early project implementation stage, a workshop will be organised to inform project activities to all relevant stakeholders. The project will hold consultations with potential private sector groups and SMEs to offer opportunities to enter into fish value chain development.

Feed the Future, USAID, WorldFish logos and taglines and the full project name will be presented in all presentations made at training and workshops.

Feed the Future, USAID, WorldFish logos and taglines and the full project name will be presented on promotion material, factsheets, reports, and other project documentation including Social and Behavior Change messages, posters and other communication material .

Feed the Future, USAID, WorldFish logos, taglines and the full project name will be clearly visible on banners and sign boards set up during all relevant project activities and sites.

(3)WHAT IS THE MAIN PROGRAM MESSAGE(S)?

Key messages for the primary audience: Through the FtF Sierra Leone SAP Project, USAID will endeavour to strengthen smallholder aquaculture farmers and private sector by strengthening their capacities to engage in aquaculture as an agribusiness by supporting the access to credit, markets and technology development. Messaging will communicate the private sector participation in the project and the ways in which potential private partners and SMEs can obtain support or technical assistance to strengthen their capacities enter and engage in fish value chain development. These value chain improvements are sustainable in the long-term and enhance income, nutrition and food security. Gains and accomplishments will be highlighted through success stories/snapshots, photo reports, and press releases. Where appropriate, events will be given appropriate media exposure.

Key messages for the secondary audience: The FtF Sierra Leone SAP Project is designed to increase the aquaculture productivity, income and nutrition and food security status of farming households and offer investment opportunities for private sector and SMEs to develop fish value chain. Where appropriate, the FtF Sierra Leone SAP Project will pursue collaborations with Ministry of Agriculture, Food Security and Forestry and Ministry of Fisheries and Marine Resources to create partnerships and support between government and private businesses.

Illustrative messages may include the following language:

“The **Feed the Future Sierra Leone Scaling up Aquaculture Project** was made possible by USAID: From the American People, as part of Feed the Future, the U.S. Government’s global hunger and food security initiative.”

(4)WILL WORLD FISH ANNOUNCE AND PROMOTE PUBLICLY THIS PROGRAM OR PROJECT TO HOST COUNTRY CITIZENS?

WorldFish will work with local authorities in their areas of operation to announce and ensure the public promotion of the program. Any public event will include the message of “USAID: From the American people” along with “Feed the Future: the U.S. Government’s global hunger and food security initiative”, with the appropriate Feed the Future, USAID and WorldFish logos.

(5) ADDITIONAL IDEAS ABOUT HOW TO INCREASE AWARENESS THAT THE AMERICAN PEOPLE SUPPORT THIS PROJECT OR PROGRAM.

WorldFish will regularly acknowledge at meetings, training, and workshops with project participants and community members, as well as with government, donor and peer agencies, and at knowledge sharing platforms and event-based messaging that the program was made possible through the support of USAID, Feed the Future, and the American people.

C. ACKNOWLEDGEMENTS

(1) WILL THERE BE ANY DIRECT INVOLVEMENT FROM A HOST-COUNTRY GOVERNMENT MINISTRY?

WorldFish will work in collaboration with the local Ministry of Agriculture, Food Security and Forestry and Ministry of Fisheries and Marine Affairs to implement project activities and participate in district coordination meetings with local government authorities. The officials will continue to be consulted when planning and implementing all activities, and the program will keep them informed regularly through knowledge sharing platforms, reports, joint missions, and meetings.

(2) WILL THE RECIPIENT ACKNOWLEDGE THE MINISTRY AS AN ADDITIONAL CO-SPONSOR?

No.

(3) INDICATE IF THERE ARE ANY OTHER GROUPS WHOSE LOGO OR IDENTITY THE RECIPIENT WILL USE ON PROGRAM MATERIALS AND RELATED COMMUNICATIONS.

No

MARKING PLAN

A. PROGRAM OUTPUTS (“PROGRAM DELIVERABLES”)

(1) PROGRAM, PROJECT OR ACTIVITY SITES

Banners or sign boards with Feed the Future, USAID, and WorldFish logos and taglines on them will be displayed at project activity sites.

(2) STUDIES/REPORTS/PAPERS

All reports and information material to be produced will be marked with the Feed the Future, USAID, and WorldFish logos as per USAID branding guidance and taglines. WorldFish will clearly acknowledge the financial support and use appropriate Feed the Future, USAID and WorldFish logos and taglines on all relevant documents and communications.

(3) PUBLICATIONS

All studies, reports, publications, Web sites, and all informational and promotional products will carry Feed the Future, USAID and WorldFish identity.

All studies, reports, publications, Web sites, and all informational and promotional products not authored, reviewed, or edited by USAID will contain a provision substantially as follows:

“This study/report/publication/Website is made possible by the support of the American People through the Feed the Future Programme of the United States Agency for International Development (USAID). The contents of this study/report/publication/Website are the sole responsibility of WorldFish and do not necessarily reflect the views of USAID or the United States Government.”

Publications in peer reviewed journals will include the following in the acknowledgements.

“This publication is made possible by the support of the American People through the Feed the Future Programme of the United States Agency for International Development (USAID).”

(4) AUDIO-VISUAL PRODUCTIONS (INCLUDING TV AND/OR RADIO PROGRAMMING)

The project will use radio programming for behavior change communication messaging. Acknowledge the sponsorship by Feed the Future Programme and USAID.

(5) WEBSITES/INTERNET ACTIVITIES

Follows USAID Graphics Standard Manual guidelines for full branding (If applicable)

(6) OTHER PROMOTIONAL/INFORMATIONAL COMMUNICATIONS

Press releases: Press Releases will include disclaimer per FTF Graphic and Naming Standards Manual.

Factsheet about the project: Feed the Future, USAID and WorldFish logos as per USAID branding guidance

Success stories: Feed the Future, USAID and WorldFish logos as per USAID branding guidance on the first page

Training material and manuals: Feed the Future, USAID and WorldFish logos as per USAID branding guidance on the first page

Briefing papers/narratives and memoranda: Feed the Future, USAID and WorldFish logos will be printed on the cover of documents; design follows USAID Graphics Standard Manual guidelines for full branding guidelines unless co-branding is acceptable

Business cards: USAID standard graphic identity will not be used on business cards. WorldFish identity will be printed, but include the full project name

(7) EVENTS

The Feed the Future, USAID, Farmer to Farmer and CRS logos and taglines will be prominently displayed at all planning, training and evaluation workshops.

(8) COMMODITIES

N/A

(9) PRE-PRODUCTION REVIEW

N/A

B. TABLE OF DELIVERABLES TO BEMARKED

Project deliverables follow USAID Graphics Standard Manual guidelines for full branding

The following project deliverables follow USAID Graphics Standard Manual guidelines for full branding.

Quarterly progress reports

Annual progress reports

Annual work plans

M&E plan

C. TABLE OF DELIVERABLES

N/A