Funding Mechanisms for Agriculture value chains - Ghana

- Ministry of Food and Agriculture

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THE WORLD BANK

Contents

Executive summary	**6**
Value Chain Analysis of selected products	**26**
Funding Mechanisms	**40**
Proposed Funding Mechanism	**61**
Financial & Economic Analysis of selected Mechanism	**68**
Risks and Mitigation plan	**87**
Literature review of some selected case studies	**92**
Appendices	**101**

Scope and Bases

We have performed this priority engagement in line with the Scope of Ministry of Food and Agriculture and our professional experience in similar engagements

Scope

- The assignment involved the completion of the following:
- Determination of various funding mechanisms that are available in the agriculture sector for the selected value chains, namely:
    - Maize
    - Rice
    - Soya Bean
    - Poultry
- Assessment of the viability and impact of these funding mechanisms, using previous MoFA projects and other development programs as a point of reference. This was to include interviews with previous beneficiaries and funds/grants and impacts on their agribusinesses.
- Recommendation of the appropriate funding mechanisms that would improve productivity, efficiency and profitability, as well as commercial viability of the Project's investments
- Perform a potential impact analysis of the recommended mechanism on the selected value chains by carrying out the following:
    - Conduct financial and economic modelling of the proposed value chains to assess their viability
    - Conduct a risk analysis of the proposed financing models under each value chain

Scope (Cont.)

- Based on key assumptions in underlying the models and other parameters of the Project's financing mechanisms, propose a funding plan that would sustain the benefits of the interventions for all actors of the value chain.

Locations visited and interviews

- Our methodology was developed around meetings with the Food Systems Resilience Project (FSRP) in their office to firm up the scope of work and the timeline for delivery. The Project Coordinating team furnish us with contact persons with selected districts and institutions.
- The communities visited includes Paga, Fumbisi, Kubogu, Nakpanzoo, Zangbalum, Savulugu, Karaga, Woribogu, Kintampo, Bankai, Busunya, Klenormadi, Asutsuare for the crop sector (i.e. Maize, Rice and Soybean).
- For the Poultry sector, the team visited Okyereko, Queens City, Gada, Dormaa Ahenkro, Sunyani, Kumasi, Asaman- Lake Bosomtwi, Mankranso, Juaben and Tema Newtown.
- The team also had interviews with selected financial and non-bank financial institutions including: GIRSAL, Ghana Commodity Exchange, National Food Buffer Stock Company (NAFCO), ADB, ABSA, PJF Secretariat, GASIP, Chamber of Agribusiness, Republic Bank, National Insurance Commission, ECOBANK, National Investment Bank (NIB)

Other Sources of information

- We have sourced our information from:
    - ✓ Ministry of Food and Agriculture
    - ✓ Other publicly available information.

Approach and Methodology

Our approach included, inter-alia, the following procedures:

Desk Review of Relevant Documents

- We conducted desk review of relevant document on past experiences/projects in Ghana and other developing countries on the value chain funding mechanism in the agricultural sectors of those developing settings.
- We reviewed documents on Ghana Agricultural Sector Investment Project (GASIP), National Food Buffer Sock Company (NAFCO), Ghana Commodity Exchange (GCX), Ghana Incentive-Based Risk Sharing System for Agriculture (GIRSAL) and Millennium Development Authority (MIDA) Project

Data Collection and field work

- The quantitative data was collected from key actors within the chain. To do this, we designed questionnaires to collect data on the operations of the activities of the various actors within each of the chain. This was administered to selected individuals and organizations. A survey of some key actors was done by collecting data face-to-face.
- Focus Group Discussions (FGD) was employed to collect key qualitative data within the sampled communities. This was done to corroborate and effectively triangulate some of the quantitative data. A total of 20 FGDs were conducted; one per district.
- The team also employed Key Informant Interview (KII) to collect qualitative data in order to gain insight about the perceptions or experiences of stakeholders or implementing partners. Through the use of KII we obtained relevant information from knowledgeable stakeholders pertaining to the project.

Mapping of value chain actors

- To place this analysis in perspective, we focused on identifying actors for the value chains of the following commodities within the project intervention areas:
  - Rice
  - Maize
  - Poultry
  - Soya bean
- In identifying the specific actors for each commodity, we limited the selection of the actors to the four levels of Inputs, Production, Processing, Distribution and Consumption.

Financial and Economic analysis

- To assess the financial and economic net benefits, we evaluated the future flow of benefits and costs With and Without the project intervention using various investment appraisal tools like the Net Present Value (NPV), Internal Rate of Return (IRR) and Return on Invested Capital (ROIC).
- The projected Net Present Value of the activities of actors With and Without the project over the projected lifespan was calculated. The annual benefit stream of each project was determined by subtracting the cost of investments and recurrent expenditure from the computed projected incomes.
- The Costs and Benefits was discounted using the discount rate, to arrive at the Net Present Value, as indicated in the formula below: $NPV = \Sigma (Bt - Ct) / (1+ r)t$.

Glossary

ADB	Agricultural Development Bank
B/C	Benefit/Cost
BNF	Biological Nitrogen Fixation
CAP	Coronavirus Alleviation Programme
CRG	Credit Risk Guarantee
EIU	Economic Intelligence Unit
FAO	Food and Agricultural Organization
FBOs	Farmer Based Organizations
FDI	Foreign Direct Investment
FGD	Focus Group Discussion
FSRP	Food Systems Resilience Project
FYEI	Fidelity Young Entrepreneurship Initiative
GGBL	Ghana Guinness Breweries
GIRSAL	Ghana Incentive-Based Risk Sharing System for Agricultural Lending
GIZ	Gesellschaft fur Internationale Zusammenarbeit
GREL	Ghana Rubber Estate Limited
IRR	Internal Rate of Return
IRS	Interest Rate Scheme
KIS	Kpong Irrigation Scheme
MoFA	Ministry of Food and Agriculture
MT	Metric Tonnes
NAFCO	National Food Buffer Stock Company
NBFIs	Non-Bank Financial Institutions
NIB	National Investment Bank
NPK	Nitrogen Phosphorus Potassium
NPV	Net Present Value
PFJ	Planting for FOOD and Jobs
ROAA	Rubber Outgrowers' and Agents' Association
SARI	Savannah Agricultural Research Institute
SRID	Statistics Research and Information Directorate
TNS	TechnoServe
UNCTAD	United Nations Conference on Trade and Development
VSLA	Village Savings and Loans Associations
WRFP	Warehouse Receipt Financing Product

Executive Summary

— *overview of project*

Executive Summary | Overview of Project

This report seeks to answer the key requirement of the sponsors by highlighting the project objectives and responding to it

Background

- The Government of Ghana, through the Ministry of Food and Agriculture is implementing the Food Systems Resilience Project (FSRP) across the major food baskets of Ghana. The development objective of the FSRP is to increase preparedness against food insecurity and improve the resilience of food systems in Ghana.
- This development objective is expected to be achieved through improving farmers' access to usable weather, climate and advisory services; improving access to local climate information services; facilitating the co-production of services between private and public sector; increasing farmers' access to agricultural and nutrition sensitive technologies, promoting private sector involvement in regional agricultural trade, among other factors.

Components of Food System Resilience Project (FSRP)

- The Food Systems Resilience Project is organized around five core distinct but interrelated components :
  - Improving digital advisory services to support timely agriculture and food crisis prevention and management
  - Sustainability and adaptive capacity of Ghana's food systems productive base
  - Enhancing regional food market integration and agricultural inputs and output trade
  - Contingency emergency response
  - Project Management

Objective of Consultancy

- In its quest to identify the appropriate funding mechanism to employ for the various interventions, the Project seeks to recruit an individual consultant with requisite expertise in the agriculture value chain financing models.
- The consultant is to determine the most appropriate funding mechanisms to improve productivity and competitiveness of project beneficiaries.
- The Consultant is also expected to propose a funding plan that would sustain the benefits of the interventions for all actors of the value chain.

Expected impact of project

The project promises the following rewards to the government, individual actors of the various value chain and the society at large:

- Government will have a roadmap to allocate funds to the various actors of selected value chains. This will fuel the achievement of food security in the long and medium term.
- Beneficiaries will have accessible credits to enhance their business objectives. Profits from the agricultural ventures will help eradicate/alleviate poverty among beneficiaries;
- The social impact will be seen in the improvement in the standard of living within beneficiary areas.

Executive Summary | Rice Production & distribution

The rice production value chain actors include seed producers, farmers, input dealers, aggregators, transporters, warehouse owners, processors and marketers.

Rice Production and distribution in Ghana

- Rice is one of the most important food staples in Ghana and its consumption keeps increasing as a result of population growth, urbanization and change in consumer habits. It is a labour intensive crop and it is cultivated both as a food and a cash crop.
- The consumption of rice continue to increase due to population growth, urbanization and change in consumer habits with a lot more households consuming more imported rice. According to statistics from MoFA, between 2008 and 2020, paddy rice production was in the range of 0.302 million MT and 0.987 million MT (181,000 to 622,000 MT of milled rice) with large annual fluctuations. The total rice consumption in 2020 amounted to about 1.45 million MT which is equivalent to per capita consumption of about 45.0kg per annum.

Rice Production and distribution in Ghana

- Ghana depends largely on imported rice to make up for the deficit in domestic rice supply. Hence the need for food and agriculture sector stakeholders to ensure increased and sustained domestic production of good quality rice for food security, import substitution and savings in foreign exchange. More efforts are needed to make the domestic rice value chain competitive that would lead to the growth and structural transformation of the economy.
- While production of rice over the years has seen improvement significant challenges in both the rice seed and grain value chains continue to exist. During the post-harvest stage, for instance, maintaining quality standards to make our domestic rice competitive remains a challenge as inadequate processing infrastructure and modern milling machines, insufficient silos for storing paddy before milling, inadequate quality standard testing for both seed (paddy) and milled rice have not seen much improvement.
- The rice production value chain actors include seed producers, farmers, input dealers, aggregators, transporters, warehouse owners, processors and marketers. The percentage of rice farming is largely increasing. The major constraints for the development of rice production chain during the Focus Group Discussions highlighted include inadequate access to inputs (seed and fertilizer), inadequate harvesting and post-harvest management technologies, and the weak local rice marketing system and post-harvest losses which is projected to be 4% on average of rice produced in 2022.

Existing funding avenues for actors in Ghana

- Self funding
- Village Savings And Loan Association
- Government subsidies
- Rice marketers

Executive Summary | Maize Production & Distribution

We noted that outgrower schemes or contractual arrangements have had positive effects on outgrowers, who benefited from a significant increase in income as well as improved access to technology, extension, and social and economic infrastructure (roads, schools, processing facilities) provided by the sponsoring companies

Maize Production and distribution in Ghana

- Maize is the most important cereal crop on the domestic market in Ghana. It is one of the largest agricultural commodities in terms of production volume, it is also important for poultry feed as well as a substitute for the brewing industry, and it is cultivated under traditional production methods and rain-fed conditions. Maize is grown throughout Ghana. However, the leading producing areas are mainly in the middle-southern parts of the country.
- Furthermore, maize is a widely consumed and cultivated staple crop in Ghana. It accounts for more than one-quarter of calories consumed. About three-quarters of maize consumption is from its local production.

Maize Production and distribution in Ghana

- According to data published by FAO, the production of maize increased to 3.5million MT in 2021 compared to 2.9million MT in 2019. An increase in the production of maize is driven by the high demand for domestic consumption. For instance, as per a report published by the Statistics Research and Information Directorate (SRID) of the Ministry of Food and Agriculture (MoFA), the per capita consumption of maize in Ghana stood at 75.91 kg per annum in the year 2020, an increase of approximately 3% from the previous year.
- The maize production value chain actors include seed producers, farmers, input dealers, aggregators, transporters, warehouse owners, processors and marketers. The percentage of maize farming is largely increasing. The major constraints for the development of maize production chain during the Focus Group Discussions highlighted include inadequate access to inputs (seed and fertilizer), inadequate harvesting and post-harvest management technologies.

Existing funding avenues for actors in Ghana

- From our field research, the majority of maize farmer's main source of finance comes from loans from Village Savings and Loans Associations (VSLA).
- Maize farmers also finance their farms from personal incomes from savings from farm produce and animal's sales.
- Moreover, a few of the maize farmers also mentioned receiving loan support from some rural banks to support their farming activities.
- Aggregators also provide support to maize farmers through pre-financing of the farming activities at an agreed rate per amount received where farmers pay in kind with bags of maize as agreed at the beginning of the farming season.
- Majority of the input dealers main source of funding is from personal sources and credit sales from their suppliers after depositing a specified amount and they are supplied to a tune of inputs to be paid within an agreed period.

Executive Summary | Soya Bean Production & distribution

While there is increased demand for soya in Ghana, reports also indicate that there has been a tremendous increase in the export of soya from Ghana.

SoyaBean Production and distribution in Ghana

- Soya bean is a non-staple crop in Ghana and is predominantly used as livestock feed. Soya production is gradually attaining commercial status as more producers are becoming aware of the availability of market for the product. With the introduction of the PFJ in 2017 yields began rising from the production of soya bean. The implementation of the PFJ programme targeted upscaling the production of Soya Bean. The efforts by government resulted in a substantial increase in yields and production of the crop.
- The production of soya is currently being subsidized by government, is to ensure its availability for processing and use as animal feed by domestic livestock and poultry industry at a cheaper cost to boost local production.

Soya Bean Production and distribution in Ghana

- We noted that, about 90% soya is mainly produced in the Northern part of the country and transported to southern Ghana. There is an increasing economic value of soya in Ghana. There is a growing market for soya bean in Ghana, with an increase in domestic demand consistently exceeding domestic supply. Both the agriculture and aquaculture sectors in Ghana are major consumers of soya bean meal, as it is a key ingredient in animal feed. The poultry industry alone demands about 75% of the total soya bean annually in Ghana. Because there is increased awareness on healthy dieting habits, consumers are increasingly consuming poultry and poultry products, meat, fish, as well vegetable oils. These factors are contributing to the indirect increase demand for soya bean.
- While there is increased demand for soya in Ghana, reports also indicates that there has been a tremendous increase in the export of soya from Ghana. The competition for the crop as an export product is creating shortage of the commodity for use by the livestock, aquaculture and poultry industry and has resulted in price hike and its availability. This defeats the purpose for which soya bean is being promoted in the country. High cost of feed in the poultry and aquaculture sectors is a major constraint to production. Feed costs are estimated to contribute over 60% of production costs in Ghana.

Existing funding avenues for actors in Ghana

- From our field research, the majority of Soybean farming in the Northern are funded by Governments of donor agencies.
- Some Soybean farmers maintain that they finance their farms from personal incomes from personal savings, family and friends.
- A few of the soybean farmers also mentioned that they received farm inputs such as seeds from off-takers and processors but limited to some few communities from the responses which are paid back by deducting at source.

Executive Summary | Poultry Production & distribution

Majority of farmers farm the broilers towards festivities such as Easter, Ramadan and the Christmas with the Christmas being the most profitable season.

Poultry Production and distribution in Ghana

- The poultry sector continues to play a key role in the provision of protein content of the population in Ghana. The issues facing the poultry farmers in the areas visited include lack of capital, high feed cost, competition from heavily subsidized imported birds in terms of broiler production, lack of secured market for poultry products, high price of day old chicks (DOC), quality of DOC, lack of knowledge of disease outbreak and high cost of transporting poultry infrastructure.
- The poultry value chain includes hatchery, Poultry farmers, feed millers/sellers, drugs sellers, marketers, restaurants etc. The success of the poultry industry in Ghana is dependent on three (3) pillars namely;
    - Environment
    - Chicks and;
    - Nutrition

Poultry Production and distribution in Ghana

- The environment includes the structure and its sighting which takes into consideration space and handling of bio security to prevent outbreak of diseases. Also, the selection and hatchery of DOC is important to the successful operation of poultry as their survival is linked to the production from the hatchery backed by research and development of the birds for the Ghanaian market. Lastly, the nutrition content is key to the survival of the birds and quality feed production. These three pillars are key indicators to the poultry funding mechanism in Ghana.
- The farmers interviewed expressed their frustration in accessing credit for their business. This challenge stems from the common premise among financial institutions that poultry business is high risk and lack of interest of most financial institutions to offer loans to poultry farmers. The few who are successful with loans indicated the interest rates were high and no moratorium for the repayment of the loans based on the production of either broilers and layers respectively.

Challenges faced by farmers in accessing credit.

The poultry farmers faced a lot of challenges in accessing credit which includes;

- Banks belief that, there is high risk involved in poultry leading to lack of interest of financial institutions
- High interest rate
- No moratorium granted for loans to poultry farmers.
- Request for landed property in particular areas to qualify for loans
- Lack of available poultry processing factories to operate as off takers to process the chicken for the market

Executive Summary |Funding Mechanisms

Various funding mechanisms have been implemented in Ghana to sustain food security and achieve various agriculture objectives including outgrower scheme, Village Savings & Loan Association, Credit guarantee, among others

1 Out grower Scheme

Outgrower Scheme

- Out grower schemes are systems that connect networks of unorganized smallholder farmers with domestic and international buyers. It is also known as contract farming. It provides benefits to actors along the supply chain. Buyers can improve their control over crop supply, often at pre-agreed prices, as well as crop quality standards. And farmers can access more secure markets, often receiving technical and financial support by cultivating within out grower schemes.
- Under the scheme, the buyer usually provide major farming inputs (like seed, fertilizer, agrochemicals), credit, and/or technical assistance to contract farmers.

Outgrower Projects in Ghana
- FYSSO Outgrower farming business model operated by FYSSO Ghana from 2014 to 2017 linked 4,663 farmers, including 1,617 female in rice farming.
- Ghana Rubber Estates Limited (GREL) and ADB Outgrower scheme

2 Village Savings & Loan

Village Savings & Loan Association

- The Village Savings and Loan Association (VSLA) is a group of people, usually 5-30, who meet regularly to save together and take small loans from these savings.
- The model focuses on savings, asset building and the provision of credit proportionate to the needs and repayment capacities of the borrowers.
- From our research, VSLA is predominate in most communities in Ghana

VLSA Projects in Ghana
- Feed the Future Agricultural Development and Value Chain Enhancement project (FTF ADVANCE II) USAID, 2022
- Greater Rural Opportunities for Women (GROW) Project by MEDA – Mennonite Economic Development Associates and Funded by Global Affairs Canada, MeDA, 2021.

3 Credit Guarantee

Credit Guarantee Scheme

Institutional Guarantee: Credit Guarantee Institutions are Non-bank Financial Institutions (NBFIs) aimed at facilitating the access to formal lending through the provision of credit guarantees that mitigate the risk of non-repayment.

Group Credit: This is mechanism whereby members of a group guarantee each other's loan repayment. Each member is equally liable for repayment, hence, collateral is not necessary. The group members are expected to do their best not to let each other down in loan repayment, since usually they are business colleagues, neighbors or relatives.

Loan Guarantee Projects in Ghana
- Agricultural Credit Risk Guarantee Scheme by the Ghana Incentive-Based Risk Sharing System for Agricultural Lending (GIRSAL)
- The Fidelity Young Entrepreneur's Initiative (FYEI) launched in 2021

Executive Summary | Selected Funding Mechanisms of interest

Warehouse receipt, trade credit and input supplier credit are notable funding mechanisms in the agriculture value chain in Ghana and Africa

4 Warehouse Receipt Finance

Warehouse receipt Finance (WRF)

- A warehouse receipt is a financial instrument which certifies that a certain quantity and quality of a commodity has been deposited in a very secure warehouse. In other words, the warehouse receipts system (WRS) is a process where farmers deposit their products in certified warehouses. After weighing the amount of product brought into the warehouse, the farmer is then issued with a warehouse receipt as proof of ownership.
- The receipt demonstrates that the goods are physically in the warehouse and secure and safe since they are kept in a licensed warehouse and can be used as collateral.

- WRF is being implemented in Ghana by International Finance Corporation (IFC) and the Ghana Commodity Exchange in a Project called the IFC Ghana Warehouse Receipt System (WRS) Project. The Project is being implemented in collaboration with the Ghana Commodity Exchange (GCX) in nine regions in Ghana.

5 Trade Credit

Trade Credit

- It is a type of commercial financing in which the customer is allowed to purchase goods or services and pay the supplier at a later scheduled date.
- Trade credit may provide access to capital for farmers that are unable to raise it through more traditional channels. Suppliers may be better than specialized financial institutions in evaluating and controlling the credit risk of their buyers.

- Through the Agribooster initiative, the Africa Fertilizer Financing Mechanism (AFFM) and OCP Africa use an inclusive approach to provide farmers access to quality inputs, training, finance and market linkages in order to increase their yields, incomes and livelihoods.

6 Input Supplier Credit

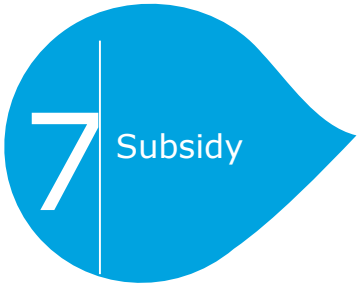
Input supplier credit

- Input supplier credit is one of the informal sources of credit available to farmers.
- Farmers do not have a regular income and become seasonally short of cash. Input suppliers allow them to purchase their inputs and pay for them at a later date when they acquire cash. This is different from input subsidies where inputs are not paid in full or not paid at all.
- The repayment for input suppliers' credit is usually made after the harvest.
- Input suppliers may also provide technical advice.

- USAID supported ZATAC in Zambia to link farmers in a project called Agriflora.
- Agriflora in Zambia is an example of small farmers being linked to input suppliers trough farmer associations and focused donor support.

Executive Summary |Funding Mechanisms

Various funding mechanisms have been implemented in Ghana to sustain food security and achieve various agriculture objectives including government subsidy and grant



- A subsidy is a direct or indirect payment, economic concession, cost reduction or privilege granted by a government to private firms, households, or other governmental units in order to promote a public objective.
- Subsidies to agriculture value chain have been phenomenal in Ghana as well as other countries on the grounds that preservation or expansion of this industry, even at a cost to the general public, is in the public interest. Farmers receive free inputs, reduced input costs, among other benefits.

Subsidy scheme of Planting for Food & Jobs (PFJ)
The on-going PFJ program of the Government of Ghana has the following subsidy schemes:

- Supply of improved seeds to farmers at subsidized prices (50% subsidy);
- Supply of fertilizers to farmers at subsidized prices (50% price cut);
- Free extension services to farmers

Grant scheme

- Although the terms “subsidy” and “grant” are often used interchangeably, a distinction can be made between them. Grant is a type of subsidy but not the same as subsidy. Whereas subsidies are current payments (products, inputs or cash) aiming to influence levels of production or prices, grants are direct financial contributions for specific activities that support the policy objectives of the grantor.
- Grants are therefore direct cash or monies that usually do not have to be repaid but are to be used for defined purposes.

The Savannah Agriculture Value Chain Development Project:

- In 2022, African Development Fund approved a $27.9 million grant to Ghana for the development of agricultural value chains in the Savannah region.
- The Savannah Agriculture Value Chain Development Project will be implemented by Ghana’s Ministry of Food and Agriculture from 2023 to 2027.

Executive Summary | Selected Funding Mechanisms of interest

The proposed funding mechanisms for the Food Systems Resilience Project is a heterachy type but revolves around four key funding approach based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

Applicability / Feasibility

- Identifying and mobilising the actors would be less costly and easy because MOFA extension officers are all over the country.
- There are some existing structures in the country such as the Self Managed and self capitalized nature of VSLS would make it easier to manage by the FSRP office.
- Guarantee system is already in operation (GIRSAL) so using their model or drawing support from their activities would not be difficult to apply such scheme by the FSRP office.
- The success of insurance and subsidy schemes by institutions such as PFJ , GASIP & NIC, is a sufficient condition for FSRP to implement the same.

Suitability / Ease of implementation

- Because of the numerous benefits such as creation of accessibility and improvement in the financial health of participants to the project, it would be easily accepted , hence ease of implementation.
- The communal nature of these selected schemes make it easier to implement since each member owns part of the funds (VSLA scheme) and serves as guarantor to the others (guarantee scheme).
- The rates charged under these schemes are always lower than the market rate. E.g. Large commercial farmers may get some form of interest rebate. Also, with guarantees, financial institutions will likely offer financial support.
- The intervention will stimulate additional production of the selected products thereby encouraging more participation in the coming years.

Sustainability

- The with and without intervention analysis has shown how this project would be beneficial. Cascading the effort/benefit would mean sustainability, all other factors held constant.
- The complementarity of the chosen schemes suggest a remunerative provision for all actors of the value chain. This will unambiguously ensure food security in the nearest future and beyond.
- There are quite a number of assessment reports on various schemes implemented in Ghana under MOFA projects. These projects offer semblance of sustainability with few caveats. FSRP is easily able to circumvent around these reflags to make the project sustainable.

Executive Summary | Selected Funding Mechanisms of interest

The proposed funding mechanisms for the Food Systems Resilience Project is a heterachy type but revolves around four key funding approach based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

Scope of impact

- The chosen schemes offer more benefits to the actors than the other funding mechanisms. E.g. Grants/Subsidies would be a better option than an outgrower scheme where the intended beneficiaries may be shortchanged by the Lead Firm.
- The economic and financial analysis over the life of the project have demonstrated how subscribers to the project would have improved income. This will encourage more agric investment & productivity, thus ensuring food security.
- The selected schemes if well implemented would boost growth and create abundant employment opportunities, especially for the youth by transforming agriculture and industry as a whole. This will enhance production and reduce imports, e.g. rice

Comparative challenges

- The challenges of the chosen schemes are quite manageable than the other funding schemes. This is because of the carefully selected funding mechanisms from the menu of possible schemes for all the value chain actors. E.g. The challenge with outgrower or lead firm scheme to farmers can easily be avoided in the case of VSLA. With input dealers, the challenges of subsidy is more manageable than e.g. Trade Credit.

Time for implementation

- Given that MOFA has district offices throughout the country, identifying and registering potential beneficiaries would be faster under the VSLA Scheme than if it were to be a lead-Firm or outgrower scheme. Identifying lead firms, assessing them, signing contracts with them, and the selected firms mobilising farmers under the scheme (Nucleus farmer scheme) could affect the implementation time of the project.

Executive Summary | Selected Funding Mechanisms of interest

The proposed funding mechanisms for the Food Systems Resilience Project is a heterachy type but revolves around four key funding approach based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

The heterachy approach used in this report is a generic menu used in international production (Reinert, 2021). It is a matrix that enables complex interactions to be presented easily. The adoption of this approach stems from the fact that each value chain (VC) actor has distinct characteristics and financing requirements (FAO & AFRACA, 2020). A producer will require finance for farm investments or inputs, while the requirement for those engaged in processing/ packaging will require a large long-term credit and equity for investments in plant, machinery and buildings. The requirements will vary for different actors within each category as well. For example, the need for finance will vary between the large farmer and small holder farmer, depending upon the farm size. A large scale farmer will require higher credit to purchase heavy machinery, while the small scale farmer will require credit to purchase inputs like seed, fertilizer, and pesticide (González-Vega, 2006).

The table shows the selected products (Maize, Rice, Soya Bean and Poultry), the Value Chain (VC) Actors, the funding requirements, the funding mechanisms, the description of actions to be undertaken by the FSRP office, the potential risks to face / suggested mitigation; and Gender/deprived dimension.

Executive Summary | Selected Funding Mechanisms of interest

The proposed funding mechanisms for the Food Systems Resilience Project is a heterachy type but revolves around four key funding approach based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

A gendered approach to value chain development examines gender inequalities in a value chain. This helps to improve the weakest relations in the value chain and assure a comprehensive upgrading of its quality and growth. Though agriculture is the main source of employment for both women and men in rural areas of Africa, women are engaged in part-time and seasonal employment and predominantly earn relatively lower wages. Therefore, examining the participation of men and women in value chains is important as it reveals the male–female distribution in the value chain and how participation gains are shared between genders (Mensah-Bonsu et al, 2019). This informs some of the funding mechanism selected in the above table. Another dimension of the discourse has to do with areas more deprived in Ghana that may need some kind of support due to climate effect and variability. That aspect is captured by the last column of the heterachy table.

Generally, after fieldwork and literature it is clear that Agricultural VC financing comprises both internal flows of financing between participants directly within the VC as well as those who use a VC approach to determine how to best lend or invest in the VC to reduce risk and cost. Under both internal and external VC financing, it is important to understand the AVC, the transactions and its participants' strengths weaknesses and opportunities, make use of the relationships and make financing decisions accordingly

Executive Summary | Selected Funding Mechanisms

The proposed funding mechanisms are based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

Products	*Value Chain Actors*		*Purpose of intervention*	*Proposed Funding Mechanism*	*Recommended Action*
MAIZE	Input dealers	Retailers Wholesalers Seed Producers Importers	1. Enhance reliable supply 2. Boost technical knowledge of products 3. Improve quality of products 4. Adequated and safe storage facilities 5. Transportation support 6. Working capital support	-Matching Grant -Partial Guarantees -Interest rate subsidy	1. FSRP to set standard or criteria for actors to be selected for funding mechanism 2. FSRP to set Teams in charge of seed subsidy, Matching Grant and Interest rate subsidy 3. Select actors for the funding based on the approved criteria 4. Based on specific need of actor, apply the funding scheme 5. Monitor and periodically perform performance review of beneficiaries
	Famers	Small / marginal farmers Large Farmers	1. Capital for production 2. Irrigation equipment 3. Extension services 4. Access to quality seed and agro-chemicals 5. Working capital support 6. Weather management issues	-Village Savings and Loans Association Funding (for small farmers) -Seed Subsidy e.g Mobile seed centres -Matching Grant -Partial Guarantees -Interest rate subsidy -Weather and yield based insurance	1. FSRP to a special team to be in charge of VSLAs 2. Team will embark on public education of the selected locations on VSLA 3. Team will help put existing VSLAs into proper structure and also form new VSLAs in line with approved guiding principles to be set by the FSRP 4. Fund should be issued to associations 5. Associations should be put into three categories (Grant Association, Interest-free Association and Low Interest Associations) 6. Periodic monitoring, review and recommendations should be made by the FSRP team to various associations 7. For the other funding mechanisms, FSRP should set Teams in charge of seed subsidy, Matching Grant, Interest rate subsidy and Credit Guarantee 8. Select actors for the funding based on the approved criteria 9. Monitor and periodically perform performance review of beneficiaries
	Aggregators		1. Transportation support 2. Warehousing support 3. Working capital support	-Matching Grant to NAFCO to increase aggregator base -Partial Guarantees -Interest rate subsidy	1. FSRP to set standard or criteria for selecting actors 2. FSRP to Select actors for the funding based on the approved criteria 3. Based on specific need of actor, apply the funding scheme 4. Monitor and periodically perform performance review of beneficiaries
	Processors / Packagers / Distributors		1. Capital expenditure support; eg. Processing and packaging plant, sorting and grading equipment 2. Adequated and safe storage facilities 3. Working capital support	-Partial Grant to capital equipment -Credit Guarantee -Interest rate subsidy for working capital	1. FSRP to set standard or criteria for selecting actors 2. FSRP to Select actors for the funding based on the approved criteria 3. Based on specific need of actor, apply the funding scheme 4. Monitor and periodically perform performance review of beneficiaries

Executive Summary | Selected Funding Mechanisms

The proposed funding mechanisms are based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

Products	*Funding Mechanism*	*Risks*	*Mitigation actions*	*Gender / Deprived support*
MAIZE	Grant	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by beneficiaries as recovery rate is zero (free money) -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the payment of grants and subsequent grants should be based on performance appraisal of initial grants -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more grants with additional guidance to help women and deprived actors to achieve optimum impact of the FSRP.
	Subsidy (Seed and Interest rate)	-Allocation of seed subsidy to wrong actors who may not use the subsidy for its intended purpose -Mismanagement of funds by beneficiaries as recovery rate is zero (free money) -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the issuance of subsidy. Additional subsidy should be based on performance appraisal of initial subsidies -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more subsidies experienced farmers, existing farmers, women and deprived actors to achieve optimum impact of the FSRP.
	Village Savings and Loans Associations	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by associations -Risk of default by members -Political intereference	-Careful appraisal and diligence in the formation of the associations -Adequate education on the operations on VSLAs -Set guiding principles for beneficiaries to follow -Strict periodic post funding monitoring of actors -Stagger the payment of funds and subsequent grants should be based on performance appraisal of initial funds -Disconnect the FSRP from similar projects of the government	The VSLA will be categorised under three Tiers. 1. Tier 1 - Low interest fund 2. Tier 2 - No interest fund 3. Tier 3 - Grant fund The Consultant recommends that the Tier 3 associations should be dominated by women, start-ups, deprived communities, actors with
	Credit Guarantee	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Risk of default by beneficiaries -Political interference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Amount of guarantee should be based on standard factors like the historical performance, existing businesses, etc -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends that FSRP should provide only partial credit guarantee to reduce the impact of default.

Executive Summary | Selected Funding Mechanisms

The proposed funding mechanisms are based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

Products	*Value Chain Actors*		*Purpose of intervention*	*Proposed Funding Mechanism*	*Recommended Action*
RICE	Input dealers	Retailers Wholesalers Seed Producers Importers	1. Enhance reliable supply 2. Boost technical knowledge of products 3. Improve quality of products 4. Adequated and safe storage facilities 5. Transportation support 6. Working capital support	-Matching Grant -Partial Guarantees -Interest rate subsidy	1. FSRP to set standard or criteria for actors to be selected for funding mechanism 2. FSRP to set Teams in charge of seed subsidy, Matching Grant and Interest rate subsidy 3. Select actors for the funding based on the approved criteria 4. Based on specific need of actor, apply the funding scheme 5. Monitor and periodically perform performance review of beneficiaries
	Famers	Small / marginal farmers Large Farmers	1. Capital for production 2. Irrigation equipment 3. Extension services 4. Access to quality seed and agro-chemicals 5. Working capital support 6. Weather management issues	-Village Savings and Loans Association Funding (for small farmers) -Seed Subsidy e.g Mobile seed centres -Matching Grant -Partial Guarantees -Interest rate subsidy -Weather and yield based insurance	1. FSRP to a special team to be in charge of VSLAs 2. Team will embark on public education of the selected locations on VSLA 3. Team will help put existing VSLAs into proper structure and also form new VSLAs in line with approved guiding principles to be set by the FSRP 4. Fund should be issued to associations 5. Associations should be put into three categories (Grant Association, Interest-free Association and Low Interest Associations) 6. Periodic monitoring, review and recommendations should be made by the FSRP team to various associations 7. For the other funding mechanisms, FSRP should set Teams in charge of seed subsidy, Matching Grant, Interest rate subsidy and Credit Guarantee 8. Select actors for the funding based on the approved criteria
	Aggregators		1. Transportation support 2. Warehousing support 3. Working capital support	-Matching Grant to NAFCO to increase aggregator base -Partial Guarantees -Interest rate subsidy	1. FSRP to set standard or criteria for selecting actors 2. FSRP to Select actors for the funding based on the approved criteria 3. Based on specific need of actor, apply the funding scheme 4. Monitor and periodically perform performance review of beneficiaries
	Processors / Packagers / Distributors		1. Capital expenditure support; eg. Processing and packaging plant, sorting and grading equipment 2. Adequated and safe storage facilities 3. Working capital support	-Partial Grant to capital equipment -Credit Guarantee -Interest rate subsidy for working capital	1. FSRP to set standard or criteria for selecting actors 2. FSRP to Select actors for the funding based on the approved criteria 3. Based on specific need of actor, apply the funding scheme 4. Monitor and periodically perform performance review of beneficiaries

Executive Summary | Selected Funding Mechanisms

The proposed funding mechanisms are based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

Products	*Funding Mechanism*	*Risks*	*Mitigation actions*	*Gender / Deprived support*
RICE	Grant	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by beneficiaries as recovery rate is zero (free money) -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the payment of grants and subsequent grants should be based on performance appraisal of initial grants -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more grants with additional guidance to help women and deprived actors to achieve optimum impact of the FSRP.
	Subsidy (Seed and Interest rate)	-Allocation of seed subsidy to wrong actors who may not use the subsidy for its intended purpose -Mismanagement of funds by beneficiaries as recovery rate is zero (free money) -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the issuance of subsidy. Additional subsidy should be based on performance appraisal of initial subsidies -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more subsidies experienced farmers, existing farmers, women and deprived actors to achieve optimum impact of the FSRP.
	Village Savings and Loans Associations	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by associations -Risk of default by members -Political intereference	-Careful appraisal and diligence in the formation of the associations -Adequate education on the operations on VSLAs -Set guiding principles for beneficiaries to follow -Strict periodic post funding monitoring of actors -Stagger the payment of funds and subsequent grants should be based on performance appraisal of initial funds -Disconnect the FSRP from similar projects of the government	The VSLA will be categorised under three Tiers. 1. Tier 1 - Low interest fund 2. Tier 2 - No interest fund 3. Tier 3 - Grant fund The Consultant recommends that the Tier 3 associations should be dominated by women, start-ups, deprived communities, actors with
	Credit Guarantee	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Risk of default by beneficiaries -Political interference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Amount of guarantee should be based on standard factors like the historical performance, existing businesses, etc -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends that FSRP should provide only partial credit guarantee to reduce the impact of default.

Executive Summary | Selected Funding Mechanisms

The proposed funding mechanisms are based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

Products	*Value Chain Actors*		*Purpose of intervention*	*Proposed Funding Mechanism*	*Recommended Action*
SOYA	Input dealers	Retailers Wholesalers Seed Producers Importers	1. Enhance reliable supply 2. Boost technical knowledge of products 3. Improve quality of products 4. Adequated and safe storage facilities 5. Transportation support 6. Working capital support	-Matching Grant -Partial Guarantees -Interest rate subsidy	1. FSRP to set standard or criteria for actors to be selected for funding mechanism 2. FSRP to set Teams in charge of seed subsidy, Matching Grant and Interest rate subsidy 3. Select actors for the funding based on the approved criteria 4. Based on specific need of actor, apply the funding scheme 5. Monitor and periodically perform performance review of beneficiaries
	Famers	Small / marginal farmers Large Farmers	1. Capital for production 2. Irrigation equipment 3. Extension services 4. Access to quality seed and agro-chemicals 5. Working capital support 6. Weather management issues	-Village Savings and Loans Association Funding (for small farmers) -Seed Subsidy e.g Mobile seed centres -Matching Grant -Partial Guarantees -Interest rate subsidy -Weather and yield based insurance	1. FSRP to a special team to be in charge of VSLAs 2. Team will embark on public education of the selected locations on VSLA 3. Team will help put existing VSLAs into proper structure and also form new VSLAs in line with approved guiding principles to be set by the FSRP 4. Fund should be issued to associations 5. Associations should be put into three categories (Grant Association, Interest-free Association and Low Interest Associations) 6. Periodic monitoring, review and recommendations should be made by the FSRP team to various associations 7. For the other funding mechanisms, FSRP should set Teams in charge of seed subsidy, Matching Grant, Interest rate subsidy and Credit Guarantee 8. Select actors for the funding based on the approved criteria
	Aggregators		1. Transportation support 2. Warehousing support 3. Working capital support	-Matching Grant to NAFCO to increase aggregator base -Partial Guarantees -Interest rate subsidy	1. FSRP to set standard or criteria for selecting actors 2. FSRP to Select actors for the funding based on the approved criteria 3. Based on specific need of actor, apply the funding scheme 4. Monitor and periodically perform performance review of beneficiaries
	Processors / Packagers / Distributors		1. Capital expenditure support; eg. Processing and packaging plant, sorting and grading equipment 2. Adequated and safe storage facilities 3. Working capital support	-Partial Grant to capital equipment -Credit Guarantee -Interest rate subsidy for working capital	1. FSRP to set standard or criteria for selecting actors 2. FSRP to Select actors for the funding based on the approved criteria 3. Based on specific need of actor, apply the funding scheme 4. Monitor and periodically perform performance review of beneficiaries

Executive Summary | Selected Funding Mechanisms

The proposed funding mechanisms are based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

Products	*Funding Mechanism*	*Risks*	*Mitigation actions*	*Gender / Deprived Support*
SOYA	Grant	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by beneficiaries as recovery rate is zero (free money) -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the payment of grants and subsequent grants should be based on performance appraisal of initial grants -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more grants with additional guidance to help women and deprived actors to achieve optimum impact of the FSRP.
	Subsidy (Seed and Interest rate)	-Allocation of seed subsidy to wrong actors who may not use the subsidy for its intended purpose -Mismanagement of funds by beneficiaries as recovery rate is zero (free money) -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the issuance of subsidy. Additional subsidy should be based on performance appraisal of initial subsidies -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more subsidies experienced farmers, existing farmers, women and deprived actors to achieve optimum impact of the FSRP.
	Village Savings and Loans Associations	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by associations -Risk of default by members -Political intereference	-Careful appraisal and diligence in the formation of the associations -Adequate education on the operations on VSLAs -Set guiding principles for beneficiaries to follow -Strict periodic post funding monitoring of actors -Stagger the payment of funds and subsequent grants should be based on performance appraisal of initial funds -Disconnect the FSRP from similar projects of the government	The VSLA will be categorised under three Tiers. 1. Tier 1 - Low interest fund 2. Tier 2 - No interest fund 3. Tier 3 - Grant fund The Consultant recommends that the Tier 3 associations should be dominated by women, start-ups, deprived communities, actors with
	Credit Guarantee	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Risk of default by beneficiaries -Political interference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Amount of guarantee should be based on standard factors like the historical performance, existing businesses, etc -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends that FSRP should provide only partial credit guarantee to reduce the impact of default.

Executive Summary | Selected Funding Mechanisms

The proposed funding mechanisms are based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

Products	*Value Chain Actors*		*Purpose of intervention*	*Proposed Funding Mechanism*	*Recommended Action*
POULTRY	Input suppliers	Feed millers Feed distributors Farmers (maize & soya bean)	1. Enhance reliable supply of raw materials 2. Improve quality of feed 3. Adequate and safe storage facilities 4. Transportation support 5. Working capital support	-Interest Free Capital (Working / Investment Capital) -Feed subsidy -Interest rate rebate -Partial Grant	1. FSRP to set standard or criteria for actors to be selected for funding mechanism 2. FSRP to set up a team in charge of feed subsidy, Grant and Interest rate subsidy 3. Identify and register key input suppliers 4. Select actors for the funding based on the approved criteria 5. Based on specific need of actor, apply the funding scheme 6. Monitor and periodically perform performance review of beneficiaries
	Famers	Small / marginal farmers Large Farmers	1. Capital for production 2. Working capital (especially feed) 3. Vertinary services 4. Transportation support	-Interest Free Capital (Working / Investment Capital) -Feed subsidy -Interest rate rebate -Partial Grant	1. FSRP to set standard or criteria for actors to be selected for funding mechanism 2. FSRP to set up a team in charge of feed subsidy, Grant and Interest rate subsidy 3. Identify and register poultry farmers for the FSRP project 4. Select actors for the funding based on the approved criteria 5. Develop a strong relationship between farmers and input suppliers so that poultry feed will be readily available at subsidised rates. 6. Based on specific need of actor, apply the funding scheme 7. Monitor and periodically perform performance review of beneficiaries
	Aggregators		1. Transportation support 2. Warehousing support 3. Working capital support	-Interest Free Capital (Working / Investment Capital) -Interest rate rebate -Partial Grant	1. FSRP to set standard or criteria for actors to be selected for funding mechanism 2. FSRP to set up a team in charge of feed subsidy, Grant and Interest rate subsidy 3. Identify and register poultry aggregators for the FSRP project 4. Select actors for the funding based on the approved criteria 5. Develop a strong relationship between aggregators and farmers so that market for the poultry 6. Based on specific need of actor, apply the funding scheme 7. Monitor and periodically perform performance review of beneficiaries
	Processors / Packagers / Distributors		1. Capital expenditure support; eg. Processing and packaging plant, sorting and grading equipment 2. Adequated and safe storage facilities 3. Working capital support	-Partial Grant for capital equipment -Credit Guarantee -Interest rate subsidy for working capital	1. FSRP to set standard or criteria for actors to be selected for funding mechanism 2. FSRP to set up a team in charge of feed subsidy, Grant, Interest rate subsidy and Credit Guarantee 3. Identify and register poultry processors, packagers and distributers 4. Based on specific need of actor, apply the funding scheme 4. Monitor and periodically perform performance review of beneficiaries

Executive Summary | Selected Funding Mechanisms

The proposed funding mechanisms are based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

Products	*Funding Mechanism*	*Risks*	*Mitigation actions*	*Gender / Deprived Support*
POULTRY	Grant	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by beneficiaries as recovery rate is zero (free money) -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the payment of grants and subsequent grants should be based on performance appraisal of initial grants -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more grants with additional guidance to help women and deprived actors to achieve optimum impact of the FSRP.
	Subsidy (Seed and Interest rate)	-Allocation of seed subsidy to wrong actors who may not use the subsidy for its intended purpose -Mismanagement of funds by beneficiaries -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the issuance of subsidy. Additional subsidy should be based on performance appraisal of initial subsidies -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more subsidies experienced farmers, existing farmers, women and deprived actors to achieve optimum impact of the FSRP.
	Village Savings and Loans Associations	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by associations -Risk of default by members -Political intereference	-Careful appraisal and diligence in the formation of the associations -Adequate education on the operations on VSLAs -Set guiding principles for beneficiaries to follow -Strict periodic post funding monitoring of actors -Stagger the payment of funds and subsequent grants should be based on performance appraisal of initial funds -Disconnect the FSRP from similar projects of the government	The VSLA will be categorised under three Tiers. 1. Tier 1 - Low interest fund 2. Tier 2 - No interest fund 3. Tier 3 - Grant fund The Consultant recommends that the Tier 3 associations should be dominated by women, start-ups, deprived communities, actors with
	Credit Guarantee	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Risk of default by beneficiaries -Political interference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Amount of guarantee should be based on standard factors like the historical performance, existing businesses, etc -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends that FSRP should provide only partial credit guarantee to reduce the impact of default.

Executive summary | Financial Impact of Selected Mechanism

Below is a highlight of the comparative financial analysis (With vs Without Project Financial Impact on Farmers)

Maize value Chain

Average **variable cost** per 1 acre land for a planting season

GHS 4,238

and **GHS 2,000** fixed cost

Average annual Return on Investment

26.1% without the FSRP Fund

compared to

40.2% with the FSRP Fund

5 Year Net Present Value (NPV)

GHS 5,829 without the FSRP Fund

compared to

GHS 9,530 with the FSRP Fund

Poultry (Broiler) Value Chain

Average **variable cost** per 1,000 birds

GHS 65,000

and **GHS 43,200** fixed cost

Average annual Return on Investment

29.3% without the FSRP Fund

compared to

57.8% with the FSRP Fund

5 Year Net Present Value (NPV)

GHS 22,013 without the FSRP Fund

compared to

GHS 124624 with the Fund

Rice Value Chain

Average **variable cost** per 1 acre land for a planting season

GHS 5,354

and **GHS 2,150** fixed cost

Average Annual Return on Investment

56.1% without the FSRP Fund

compared to

72.9% with the FSRP Fund

5 Year Net Present Value (NPV)

GHS 15,418 without the FSRP Fund

compared to

GHS 19,880 with the FSRP Fund

Soya Bean Value Chain

Average **variable cost** per 1 acre land for a planting season

GHS 2,464

and **GHS 2,150** fixed cost

Average annual Return on Investment

49.9% without the FSRP Fund

compared to

66.8% with the FSRP Fund

5 Year Net Present Value (NPV)

GHS 6,649 without the FSRP Fund

compared to

GHS 8,997 with the FSRP Fund

Value Chain Analysis

— *Maize, Rice, Soya Bean and Poultry*

Value Chain Analysis | Maize

Funding remains a key factor in the maize value chain as the current financing alternatives are not sufficient to equip farmers to meet the growing demands and opportunities in the market.

Overview

Situational Analysis of Maize Value Chain Actors

- The maize production value chain actors include farmers, input dealers, aggregators, transporters, warehouse owners, processors and marketers. The lack of support from financial institutions such as commercial banks and rural banks in financing the value chain actors in the maize production sector, high input cost and farm maintenance cost has resulted in reduction in farm sizes and production.

Sources of Funds

- From the focus group discussions held, majority of the maize farmers depend on loans from Village Savings and Loans (VSLA) groups run at the local level under the farmer based organizations in financing their farming activities. Contributions to VSLA loan schemes serve as the basis to accessing the loan support for farming maize in the communities and our research shows that this practice has worked well over the period with low default rates.
- Ownership of the VSLA has been one of the major drivers for the repayment of the loans by farmers within the maize sector as well as the benefit of profit sharing.
- Personal incomes from savings from farm produce and animal sale is also another alternative of financing for the maize farmers. This source is however not enough to cater for inputs and farm maintenance for the maize season.
- A few of the maize farmers have received loan support from some rural banks including Bulsa Community banks in the catchment area. The Bulsa community bank gives out group loans to the farmers where repayments are made not as individuals but as group hence a default by one person affects the group credibility and group members thus members hold each other accountable.

Overview

Sources of Funds (Cont.)

- Aggregators provide support to maize farmers through pre-financing of the farming activities at an agreed rate per amount disbursed. The farmers repay in kind with bags of maize as agreed at the beginning of the farming season.
- Financing by Aggregators has been challenging for the farmers because of exploitation by some aggregators who require more bags of maize. Also, the basis of relating glut season prices which are generally low, to the loan repayment negatively affects the farmer's income.

Market for Maize

- The farmers indicated that there is a significant demand for maize. However, this is mostly on an informal basis where the harvested maize is sold to available individuals on market days at ongoing market prices based on demand and supply factors.
- There are only a few formalized market arrangements with aggregators who pick the bags of maize from the farmers at already agreed prices especially if the aggregators pre-financed the production of the maize.
- Majority of the farmers require some form of guaranteed prices to assure them of decent incomes from maize production especially in glut seasons. This will also prevent middlemen from gaining at the expense of the farmers whose ability to pay back loans or fund their farming activities tend to be affected.
- The farmers believe NAFCO, as a result of restricted funds has not been effective in buying off excess maize in the market for storage and ensuring guaranteed prices in the market.
- Off-taker arrangements for the harvested maize will prove beneficial to the farmers who expressed keen interest in partaking.

Value Chain Analysis | Maize

Lack of funding or credit avenues for the growing market size of maize production results in low yield and income for farmers. Hence the need to support farmers to acquire basic inputs like fertilizers and other input to scale production.

Overview

Need for Credit

- The maize farmers require funds to purchase inputs such as seeds, fertilizers, chemicals etc however, the astronomical increase in prices of such inputs in 2022 has made maize farmers susceptible to low yields and low incomes.
- The increase in input cost calls for support of which majority of maize farmers who participated in the focus group discussions revealed such support does not exist beyond the VSLA and personal financing. The perceived risk in the agriculture sector especially with the production of maize has deterred most financial institutions from committing resources.
- Farmers who have registered for support under the planting for food and jobs are not able to fully benefit as the required inputs come late thus not unsuitable for the rain fed nature of the maize.
- The table below shows responses from the focus group discussions on yield figures for maize production for farmers on the usage of fertilizers in the cultivation of maize for an acre of land in 2022:

District	Community	Maize Yields (Bags) per Acre with Fertilizer	Maize Yields (Bags) per Acre without Fertilizer
Bulsa South	Fumbisi	12	4
Mampurugu Moaduri	Kubogu	13	4
Karaga	Karaga	15	3
Savelugu	Nakpanzoo	15	5
Kumbugu	Zangbalum	7	2
Tolon	Woribogu	10	2
Kintampo North	Kintampo	13	4
Techiman Municipal	Bankai	22	5
Nkoranza North	Busunya	10	2

Overview

Need for Credit

- The table also shows the need for a funding mechanism to support farmers to acquire maize production inputs. The maize farmers in the areas visited showed a strong interest in accessing funds to support their maize production.
- Farmers in these communities are grouped under the farmer based organisations at the community level. The District Agriculture office is well accustomed to this structure and assigns Agricultural Extension Officers accordingly.
- The maize farmers also expressed angst about the structure and conditions of loans and support advanced to maize producers in the past. Farmers are required to provide guarantors for loans from Commercial Banks and Rural banks with interest rates ranging from 29% to 40% and those who turn to Micro Finance Institutions pay as high as 10% per month, which amounts to 60% per the six months' period.
- Additionally, the timing for repayment of loans does not allow the farmers to properly use the funds as some of the credit institutions demand repayment immediately the loans are disbursed without waiting for harvesting periods. Farmers therefore only have the option of using the same loans meant to buy inputs to service the loan which affects production and yields and hence impair their ability to repay the loans.

Value Chain Analysis | Maize

The traditional method of securing loans through the group lending scheme has proven to be an easily accessible way of funding for maize farmers. This includes local input dealers who are willing to give stocks on credit to the farmers.

Overview

Risk to Loan Repayment on Group Loans

Majority of the farmers identified the following as the main risk to loan defaults;

- Structure of loan repayment and tenure which calls for immediate repayment
- High interest rates attached to the loans
- Low yields from the farms
- Late disbursement of loans
- Politicization of agriculture support to farmers where farmers see such support as a reward for their support to a particular government in power
- Lack of capacity on the part of farmers in handling loans to support maize production
- Lack of proper arrangements for supply of quality inputs under such support for maize production
- Majority of farmers complained of delays in receiving funds/loans whether in cash or kind which normally goes beyond the planting season and such loans cannot be applied appropriately for easy pay back.

Suggestions on Loans to Support Maize Production

The Focus Group Discussion came up with suggestions for future loans to be structured as listed below;

- Group loans should be encourage where farmers have the opportunity to choose their group members in smaller groups (10 members in a group)
- A component of the loan or support should come in the form of inputs and also cash to support the maize production
- The farmers suggested an interest rate between 6% to 10% on loans
- Loan repayment should include a moratorium to be paid at the time of harvesting
- A proper arrangement with an off-taker for their maize where direct payments are made at source

Overview

Maize input dealers

- Agricultural input dealers in our research comprises table top dealers, small retail shop owners, fertilizer and chemical wholesalers.
- The agricultural input dealers sell fertilizer (Sulphate of ammonia, NPK and Urea), crop protection chemicals, agricultural tools, seeds and animal feed.
- The majority of the input enterprises are family owned, sole ownerships, established and operated from owners' own funds. The majority of agricultural dealers that sell chemicals sell directly to smallholder farmers in the communities.
- Most of the pesticide sellers in the community operate on a small scale with very limited stock options due to inadequate working capital. Purchases of stock are done either in the open market or with identified wholesalers in major towns.
- Majority of the input dealers rely on personal funds to run their business operations. However, there are other alternatives of receiving goods from suppliers on credit after depositing a specified amount for which the outstanding amount is settled within an agreed period.
- Most of the input dealers have not made any effort of approaching banks for loans but the few who attempted seeking banks loans though successful, saw the conditions to be unfavorable as high interest rates affects their profitability.
- The input dealers mostly demand cash payment with little credit arrangements to farmers as past experiences revealed default by some farmers in repaying the inputs supplied. Nonetheless, some of the input dealers are ready to provide credit to identified farmers who come as a group. In this case, the responsibility for repayment will fall on the group leaders as the input dealers will not have the capacity and time to follow up on debts.

Value Chain Analysis | Poultry

Poultry production in Ghana is underpin by three main factors such as the Environment, Chicks and Nutrition. Although there are opportunities identified in the sector, the cost of financing remains a major step back to this.

Overview

Situational Analysis of Poultry Value Chain Actors

- The poultry sector continues to play a key role in the provision of protein content of the population of Ghana. The issues facing poultry farmers in the areas visited included lack of capital, high feed cost, competition from heavily imported birds especially broiler production, lack of secured market for poultry products, high price of day old chicks (DOC), quality of DOC, lack of knowledge of disease outbreak and high cost of transporting poultry infrastructure.
- The poultry value chain includes hatchery, Poultry farmers, feed millers/sellers, drugs sellers, marketers, restaurants etc. The success of the poultry industry in Ghana is dependent on three (3) pillars namely;
    - Environment
    - Chicks and;
    - Nutrition
- The environment includes the structure and its sighting which takes into consideration space and handling of bio security to prevent outbreak of diseases. Also, the selection and hatchery of DOC is important to the successful operation of poultry as their survival is linked to the production from the hatchery backed by research and development of the birds for the Ghanaian market. Lastly, the nutrition content is key to the survival of the birds and quality feed production. These three pillars are key indicators to the poultry funding mechanism in Ghana.
- The farmers face challenges in accessing credit for their business. These challenges stem from the common premise among financial institutions that poultry business is high risk thus the lack of interest to loan to poultry farmers. The few who successfully secured loans indicated the interest rates were high and no moratorium was given for the repayment of the loans for either broilers and layers producers respectively.

Overview

Hatchery Production under Poultry

- The team visited Darko Farms as a Hatchery in the poultry value chain and observed the company has the capacity to hatch healthy day old chicks for the Ghanaian market especially in the middle belt. The facility has the needed equipment's and personnel to produce to meet the needs of the poultry farmers and to reduce the importation of DOC from Ivory Coast and Europe. However, the farm is unable to hatch to their full capacity due to funds. The Manager indicated that operating the hatchery is a profitable business if the right support is made available and there is an existing market for the DOC. The Manager also indicated that profitability on the hatchery goes up to 25% if the right support is available.
- Their main source of funding the hatchery is from personal sources since enough support does not exist in the credit space.

Broiler Production in the Communities

- Broiler production in Ghana is fraught with some challenges such as the lack of marketing opportunities in the local market which is currently flooded by cheap imported frozen chicken.
- About 20% of the poultry farmers interviewed indicated that they breed broilers with an average capacity of 300 birds due to high feed cost, medication and a lack of off-taker to purchase the broilers.
- Majority of the farmers breed the broilers towards festivities such as Easter, Ramadan and Christmas with Christmas being the most profitable season. The broilers on the average are sold off from 8 weeks to 12 weeks at a selling price based on the weight of the birds which normally ranges from GH80 to GH200 depending on location. In December 2022, some farmers in Tema sold broilers at GH200 whiles farmers in Dormaa Ahenkro and other hinterlands could only sell a bird at maximum of GH150 during the Christmas season. The selling weight of broilers is from 3kg to 4.5kg.

Value Chain Analysis | Poultry

The high cost of poultry production reduces the poultry farmers ability to produce at high capacity with some farms producing at levels below 50% around the Dormaa Ahenkro Municipality.

Overview

Broiler Production in the Communities (Cont.)

- The broiler farmer's main challenges are high feed cost, biosecurity issues, shortage of maize and soybean for feed preparation, and difficulty in selling off the birds due to uncontrolled access of the Ghanaian market with imported frozen chicken. Majority of the farmers in the poultry industry lack support from the banks due to the risk involved in broiler production and failure by some farmers in the past to pay back loans has made it difficult to access loans.
- The broiler farmers need external support in terms of feed, medicine and funds to support production in the country. Most of them are open to loans ranging from 5% to 15% interest rates structured to support their production with a moratorium to pay at the end of the production cycle.

Layers Production

- The average years of operating the layer business among the respondents was 10 years. Majority of the poultry farmers are producing layers with an average production of 1000 birds in the communities visited.
- Layer farmers also face the challenge of high feed cost, biosecurity issues, high cost of medicine and difficulty in selling off the layers due to uncontrolled access of the Ghanaian market to imported frozen chicken. Majority of the farmers in the poultry industry mentioned the lack of support from the banks for the line of business.
- A few farmers at the Sunyani and Dormaa Ahenkro Municipalities mentioned that they got loans from ADB in 2017 with an interest rate of 22%. Today, the average commercial bank interest rate is 36% which has even made it more difficult to secure credit.

Overview

Need for Credit

- In many of the areas visited, the farmers express their inability to produce at capacity as worrying due to high cost of production especially poultry feed and shortage of maize and soybean in the local market. Farmers indicated that in 2020, a tonnage of poultry feed was GH1500 but currently, it cost GH6400 to prepare the same tonnage due to increases in maize and soybean prices as well as increase in prices of prepared poultry feed especially imported feed.
- At Dormaa Ahenkro, the farmers responded that their farms are operating at 30% capacity due to challenges they face in the production of layers.
- The responses from the farmers are presented in Table 1 below:

Capacity and Usage for the production of layers

Poultry Farmers represented	Birds Capacity	Birds Capacity Stock	Percentage to Capacity
	GHS	GHS	%
Farmer A	6,000	2,000	33%
Farmer B	52,000	15,000	29%
Farmer C	11,000	1,000	9%
Farmer D	80,000	45,000	56%
Farmer E	16,000	6,000	38%
Farmer F	4,000	0	0%
Farmer G	15,000	5,000	33%
Farmer H	7,000	3,000	43%
Farmer I	27,000	7,000	26%

Table 1: Farmer responses to capacity and usage for the production of layers at the Dormaa Ahenkro Municipality.

Value Chain Analysis | Poultry

Provision of future loans for poultry farmers with structured payback methods and assisting programs would greatly contribute to large scale production.

Overview

Actors major sources of fund

- Majority of the indicated that they receive finance from the sources listed below;
    - Individual/Personal finance
    - Family and friends support
    - Financial institution-ADB, Community and rural Banks

Challenges faced by farmers in accessing credit.

The poultry farmers faced a lot of challenges in accessing credit which includes;

- Banks believe that, there is high risk involved in poultry leading to lack of interest of financial institutions
- High interest rate
- No moratorium granted for loans to poultry farmers.
- Request for landed property in particular areas to qualify for loans
- Lack of available poultry processing factories to operate as off takers to process the chicken for the market

Farmers' suggestions on Loans to Support Poultry Value Chain

The Focus Group Discussion came up with suggestions for future loans to be structured as listed below;

- Integrated insurance policy-for poultry farmers and actors in the value chain;
- Cooperatives associated with the industry can be brought in to channel the loans through poultry farmers.
- Develop pool of mentors and align poultry farmers to work under them and channel loans through such models.
- Support with technical assistance program to include veterinary services and business management by banks and private economic agents involved in agricultural value chain;

Overview

Farmers' suggestions on Loans to Support Poultry Value Chain

- Moratorium to farmers (broilers and layers farmers) for at least 6 months
- Farmers should be aware of interest subvention scheme.
- Funders can identify recognized hatcheries and feed millers to supply quality day old chicks and feed respectively to poultry farmers.
- Clear policy to reduce import in place of local production to enable broiler farmers to sell locally (Arrangement of 40/60)
- Poultry credit desk should be set up by the banks to undertake adequate risk management tools in consultation with Poultry farmer's association.
- Any loans to the poultry sector should include support for maize and soybean producers to support the feed sector.
- Build technical capacity and fostering introduction of risk mitigating schemes are essential tools needed to guarantee quality credit delivery.

Feed Millers

- The team met with some feed millers who were also poultry farmers in Dormaa Ahenkro, Sunyani and Kumasi operating their mills at small and medium size levels to support poultry production. At the small scale level, the feed millers produce the feed for their farms but not on commercial purpose. The medium scale feed millers do produce for their farms and also sell to the local market.
- The main components of their feed are maize, soybean, shells and concentrates which are combined in the appropriate quantities to meet the growth needs of the birds.
- The main challenges of the feed millers are lack of finance to buy maize and soybean in large quantities on season for storage and production which reduces the cost of raw materials. There is also shortage of maize and soybean which affects the prices of their products.

Value Chain Analysis | Rice

Rice production in Ghana on a local level is not sufficient to meet the current market demand and is mostly supported by foreign imports.

Overview

Situational Analysis of Rice Value Chain Actors

- Rice is a staple crop in the Ghanaian diet and also plays an important role in income generation for its value chain actors in Ghana. Rice demand over the period continues to rise due to population growth and the increase in per capita consumption of rice (0.5% per year). However, only 43% of the rice demand in Ghana is met by domestic production, the remaining 57% is met by rice imports (Agriculture Research for sustainable Development (CIRAD, 2007).
- The rice production value chain actors include seed producers, farmers, input dealers, aggregators, transporters, warehouse owners, processors and marketers. The percentage of rice farming is largely increasing. The major constraints for the development of rice production chain during the Focus Group Discussions highlighted include inadequate access to inputs (seed and fertilizer), inadequate harvesting and post-harvest management technologies, and the weak local rice marketing system and post-harvest losses which is projected to be 4% on average of rice produced in 2022.

Sources of Funds for Rice Production

- Inadequate support from financial institutions both from the commercial banks as well as the rural banks in financing rice production has resulted in limited possibility of expanding harvesting area due to high input cost and farm maintenance cost according to the farmers at the areas visited.
- Rice farmers receive different forms of support from the government, cooperatives (VSLA) and rice marketers. The support that farmers receive from the government are mainly in the form of training, fertilizer subsidies, extension services and the construction and maintenance of the dams especially at Asutsuare (KIS) area. The cooperatives assist farmers with cash loans to support their rice cultivation. Similarly, the marketers also provide cash loans.

Overview

Sources of Funds (Cont.)

- Rice farmers mainly finance their farms from personal savings and monies from family members working in the cities. This source is normally not enough to cater for inputs and farm maintenance.
- A few of the rice farmers at the focus group discussion at Gomoa East, Karaga and Savulugu districts indicated that they received loan support from banks and other financial institution based on their salaries from their formal employments and not as farmers. They complained about how difficult it is to secure finance for farm activities and if successful, the interest rate is high which makes repayment difficult. They lack collateral to support such loans from banks and other financial institutions.
- The story was different at the Mampurugu Moaduri district where the rice farmers revealed receiving loans from the Bulsa community bank which was disburse to groups for rice cultivation. Repayments are made not as individuals but as group hence a default by one person affects the group credibility and group members therefore members pay up to avoid default. None of the farmers defaulted in the loan disbursed to them due to the group system.
- The FGD also revealed that marketers from the cities provide support to rice farmers through pre-financing of the farming activities at an agreed rate per amount given where farmers pay in kind with bags of rice as agreed at the beginning of the farming season. The farmers believe the rate of converting the cash into bags of rice is not favourable to them as the marketers normally require more bags of rice for the loan repayment.
- Most of the rice farmer's rely on loans from cooperatives (Village Savings and Loans (VSLA) groups) run at the local level as part of the farmer based organisations. Contributions to VSLA loan schemes serve as the basis to access loan support for rice farmers in the communities with low default rates.

Value Chain Analysis | Rice

Despite the large market demand of rice production, there are still major challenges faced by farmers in this value chain such as the price arrangement, inputs for production as among other factors.

Overview

Need for Credit

- The FGD throughout the communities revealed that farmers currently need funds to purchase inputs in the form of seeds, fertilizers, tractor services, chemicals etc and the astronomical increase in prices of such inputs within the last year has made rice cultivation susceptible to low yields and low incomes as indicated in the table below. The increase in input prices call for support to farmers of which the majority of rice farmers in the focus group discussions said they lacked such support beyond their VSLA and personal financing.
- The rice farmers face challenges in accessing credit ranging from;
    - High interest rate.
    - No moratorium granted for loans
    - High risk involved in farming
    - Lack collateral security;
    - Inappropriate financing models applied by commercial banks;
    - Cumbersome process of getting loan.
    - Lack of awareness about credit package;

The table below shows responses from the focus group discussions on yield figures for rice production for farmers on the usage of fertilizers in the cultivation of rice for an acre over the last production season

District	Name of Community	Rice Yields (Bags) per Acre with Fertilizer	Rice Yields (Bags) per Acre without Fertilizer
Gomoa East	Okyereko	60	30
Bulsa South	Fumbisi	12	5
Mampurugu Moaduri	Kubogu	27	12
Karaga	Karaga	10	6
Savelugu	Nakpanzoo	25	6
Kumbugu	Zangbalum	10	3
Tolon	Woribogu	15	3
Kintampo North	Kintampo	12	5
Shai Osuoku	Asutsuare	25	10

Overview

Market for Rice

- The farmers indicated that there exists market for their rice produce through aggregators and marketers who buy them from the local market. Some of this arrangements are done with the support of the Agriculture Extension officers in the Districts. This market is mostly informal where harvest is sold to available marketers/aggregators on market days at ongoing market prices based on the availability of rice in the market. A few rice millers also buy direct from the farmers at the farm gate for processing and some arrangements are available for such processors who normally support with the pre financing which binds the farmers to only sell to them.
- There also exist a few formalized market arrangements with aggregators who pick the bags of rice from the farmers at already agreed prices especially if the aggregators pre-financed production of the rice.
- Majority of the farmers require guaranteed prices to assure them of decent incomes from rice sales especially in glut seasons to avoid middlemen gaining at their expense thus affecting their ability to pay back loans or funding.
- The farmers believe NAFCO has not been effective in buying off excess rice produce from farmers due to lack of funds for storage and ensure guaranteed prices in the market.
- The farmers are happy to have off-taker arrangements for their harvest and any financial support can be deducted at source.
- Rice farmers indicated their willingness to accept funding mechanisms that will channel support to input dealers which will reduce the cost of inputs and make them available for farmers.

Value Chain Analysis | Rice

Lack of proper arrangements for supply of quality inputs for rice production is one of the contributing factors to the risk of loan repayment by rice farmers.

Overview

Risk to Loan Repayment

- Majority of the farmers identified the following as the main risk to loan defaults;
- Politicization of agriculture support to farmers where farmers see such support as a reward for their support to a particular government in power
- Late disbursement of loans
- Variation in market prices of produce inputs
- High interest rates attached to the loans
- Structure of loan repayment and tenure which calls for immediate repayment
- Low yields from the farms
- Lack of capacity on the part of farmers in handling loans to support maize production
- Lack of proper arrangements for supply of quality inputs under such support for rice production

Suggestions on Loans to Support Maize Production

The Focus Group Discussion came up with suggestions for future loans to be structured as listed below;

- The procedure for obtaining loan should be liberalized. (The loans should be share into smaller group in the association)
- Famers should be aware about farm credit package.
- Financial institutions and VSLAs should have a moratorium for agricultural loans to meet harvest
- Farmers should be aware about interest subvention scheme.
- Some suggested both inputs and physical cash (inputs 60%/ cash 40%)
- Access to inputs in the farm seasons;
- The should be adequate risk management tools;
- Need innovation and risk-mitigation schemes

Overview

Rice input dealers

- Agricultural input dealers in the communities visited ranges from table top dealers, to small retail shop owners to fertilizer and chemical wholesalers mainly located in the big cities. The agricultural input dealers sell fertilizer (Sulphate of Ammonia, NPK and Urea), crop protection chemicals, agricultural tools, seeds and animal feed.
- Majority of the agricultural input enterprises are family owned, sole ownership established and operated from the owners' funds. The majority of agricultural dealers sell chemicals directly to smallholder farmers in the communities. What exist in the communities are individual small input (pesticide) sellers with very limited stock as a result of inadequate working capital. They usually have to purchase their list of stock on the open market or identified wholesalers in major towns.
- Majority of the input dealers rely on personal funds to run their business operations. However, there are other alternatives of receiving goods from suppliers on credit after depositing a specified amount for which the outstanding amount is settled within an agreed period.
- Most of the input dealers have not made any effort of approaching banks for loans but the few who attempted seeking banks loans though successful, saw the conditions to be unfavorable as high interest rates affects their profitability.
- The input dealers mostly demand cash payment with little credit arrangements to farmers as past experiences revealed default by some farmers in repaying the inputs supplied. Nonetheless, some of the input dealers are ready to provide credit to identified farmers who come as a group. In this case, the responsibility for repayment will fall on the group leaders as the input dealers will not have the capacity and time to follow up on debts.

Value Chain Analysis | Rice

Input dealers face quite some number of challenges when it comes to credits given to rice farmers but this can be handled through the use of off-taker agreements

Overview

Challenges and risk to loan repayments by input dealers

Input dealers mainly face the following challenges;

- Difficulty in getting the needed supplies from the supplier
- Lack of warehousing to store larger units during farming seasons which increases transport cost
- High cost of transporting the inputs which increases the cost of the products to the farmers

Rice Processors

- Until recently, consumers in Ghana mostly regard local rice as inferior to imported ones and are willing to pay premium prices for imported rice. Some of these perceptions were as a result of inefficient seed systems, low productivity in rice production, inappropriate harvesting and threshing technologies and equipment, costly transport and logistics, insufficient milling capacities and inadequate storage facilities, resulting in volume and quality post-harvest losses.
- An interaction with some rice processors evinced that they are faced with inadequate capital to invest into appropriate technologies to mill the rice to the required quality and standards that meets the Ghanaian taste as well as compete with the imported rice.
- The millers indicated that there is market for their product and any support to them to acquire new equipment's and buy paddy rice for processing will increase the local production of rice.
- An interest rate between 10% and 20% is reasonable for the rice processors to support their business and they are willing to provide off-taker system for farmers in their local areas that will provide ready market to farmers at guaranteed prices.

Value Chain Analysis | Soybean

The soya bean industry provides numerous opportunities for value chain actors from seed and grain production through to processing and marketing.

Overview

Situational Analysis of Soybean Value Chain Actors

- Soyabean is one of the most valuable leguminous crops cultivated in Ghana as it serves as both a valuable source of feed for livestock and fish and a good source of protein in human diets. Farmers in the FGD provided details on the economic importance and relevance of soyabean, both market and non-market co-benefits. The crop's ability to fix atmospheric nitrogen through Biological Nitrogen Fixation (BNF) and the use of the crop's residues as a source of feed for livestock production provides economic benefits to the land and other crop yields.
- According to the farmers especially in the Northern regions, it helps in reducing cost of production inputs (fertilizer) and most of the farmers cultivate it without applying fertilizers while others apply inoculants to support its production. Farmers therefore see Soybean cultivation as a crop for resource-poor farmers especially women, given the nutrient deficiency nature of cultivated soils in Ghana.
- The soya bean industry provides numerous opportunities for value chain actors from seed and grain production through to processing and marketing. However, soybeans farmers face challenges which include variation in environmental and climate conditions, lack of funds, poor soil, low yielding and post-harvest loses (1% -3%) according to the FGD.
- Small, medium and large scale farmers are all involved in the production of the soyabean crop dominated by small holder farmers who depend on traditional methods of farming with few technological improvements. Bushfire, poor soil fertility as a result of improper farming practices, lack of fund for inputs, postharvest losses, lack of appropriate storage are common challenges farmers are also faced with in their districts.

Overview

Sources of Funds

- The FGD revealed that soybean farmers face a lot of challenges in accessing credit, the cumbersome processes in getting loans include guarantors which are not readily available. Thus farmers are left with personal finance from sale of crops and VSLA/susu groups which is popular among soybean farmers.
- A few of the soybean farmers also mentioned that they received farm inputs such as seeds from off-takers and processors which are paid back by deducting at source.
- Loans from financial institutions were not a common trend from the FGD held across the communities as some of the farmers lacked information about credit facilities and felt the banks considered agricultural financing as risky and never made any effort to follow up on any loans. Some of the participants in the FGD also mentioned that they have been approached by micro finance institutions at a point and felt the interest rates were high ranging from 30% to 60% and a such did not show any interest.

Risk of loan repayment

Majority of the farmers identified the following as the main risk to loan defaults;

- Politicization of agriculture support to farmers where farmers see such support as a reward for their support to a particular government in power
- Late disbursement of loans
- Variation in market prices of produce inputs
- High interest rates attached to the loans
- Structure of loan repayment and tenure which calls for immediate repayment
- Low yields from the farms
- Lack of capacity on the part of farmers in handling loans to support maize production

Value Chain Analysis | Soybean

Soyabean farmers believe price stability will help them get in return a good return for every investment made in the production of the crop.

Overview

Market for Soybean

- The farmers indicated that there exists market for their soyabeans produce through processors, marketers and aggregators. Some of this arrangements are done with the support of the Agriculture Extension officers in the Districts. The bulk of soya bean produced is sold to institutions through middlemen, aggregators, or large-scale off-takers, such as the Ghana Nuts Company, Savannah Farmers Marketing Company etc. Most of these institutional buyers provide support to farmers during the farming season with an understanding that farmers will sell their produce to them after harvest at a predetermined price. Market also exists in the local markets, where small scale producers and traders sell the beans in small quantities measured in bowls.
- Participants in the marketing of the soybean are faced with lack of adequate storage facilities, inadequate capital, and poor road networks to the production centers to cart the soybean beans.
- This market is both formal and informal where the formal goes through off-takers who are mostly processors and the informal where the harvest is sold to available marketers/aggregators on market days at ongoing market prices based on the availability of the soybean in the market.
- Majority of the farmers mentioned that they need guaranteed prices to assure them of decent incomes from soybean sales to avoid middlemen gaining at their expense thus affecting their ability to pay back loans or funding.
- The farmers expressed interest in having off-taker arrangements for their harvest and any financial support that can be deducted at source.
- Soyabean farmers indicated their willingness to accept funding mechanism that will channel support to input dealers thus reducing the cost of inputs and make them available for farmers.

Overview

Need for Credit

- The FGD throughout the communities revealed the need for support in the form of inputs and cash to farmers to increase yield in table 3 below. The increase in input cost calls for support to soybean farmers of which the majority of members in the focus group discussions said they lacked such support beyond their VSLA and personal financing due.

The soybean farmers face challenges in accessing credit ranging from;

- High interest rate.
- No moratorium granted for loans
- High risk involved in farming
- Lack collateral security;
- Inappropriate financing models applied by commercial banks;
- Cumbersome process of getting loan.
- Lack of awareness about credit package;
- Though majority of the farmers had registered for support under the planting for food and jobs, mostly, the required inputs come late which does not benefit them.

Suggestions on Loans to Support Soybean Production

The Focus Group Discussion came up with suggestions for future loans to be structured as listed below;

- The interest rate charged should be lower than market rate
- Farmers should be aware about interest subvention scheme.
- The procedure for obtaining loan should be liberalized. (The loans should be share into smaller group in the association)
- Famers should be aware about farm credit package.
- Financial institutions and VSLAs should have a moratorium for agricultural loans to meet harvest

Value Chain Analysis | Soybean

The feed millers such as Darko Farms in Kumasi indicated that there is market for their products and any support to them will be used to acquire new equipment to expand production

Overview

Soyabean input dealers

- Input dealers in the communities visited have mechanisms in place for agriculture products such as rice, maize, soyabeans and other crops. Agricultural input dealers in the communities visited ranges from table top dealers, to small retail shop owners to fertilizer and chemical wholesalers mainly located in the big cities. The agricultural input dealers sell fertilizer (Sulphate of Ammonia, NPK Inoculants, and Urea), crop protection chemicals, agricultural tools, seeds and animal feed.
- Majority of the agricultural input enterprises are family owned, sole ownerships, established and operated from owners' funds. The majority of agricultural dealers that sell chemicals sell directly to smallholder farmers in the communities.
- Most of the pesticide sellers in the community operate on a small scale with very limited stock options due to inadequate working capital. Purchases of stock are done either in the open market or with identified wholesalers in major towns
- Majority of the input dealers rely on personal funds to run their business operations. However, there are other alternatives of receiving goods from suppliers on credit after depositing a specified amount for which the outstanding amount is settled within an agreed period.
- Most of the input dealers have not made any effort of approaching banks for loans but the few who attempted seeking banks loans though successful, saw the conditions to be unfavorable as high interest rates affects their profitability.
- The input dealers mostly demand cash payment with little credit arrangements to farmers as past experiences revealed default by some farmers in repaying the inputs supplied. Nonetheless, some of the input dealers are ready to provide credit to identified farmers who come as a group. In this case, the responsibility for repayment will fall on the group leaders as the input dealers will not have the capacity and time to follow up on debts

Overview

Soyabean processors

- Soyabean is a key ingredient in poultry and fish feed and is also used in the production of edible vegetable oil. Soya bean is processed both by small-scale producers, by threshing manually and piling soya bean plants on a tarpaulin or putting soya bean pods in sacks and gently beating them with a stick. Mechanical threshers are used in large-scale production. The bean is then processed into various forms; the principal product, oil, which makes up 14 to 18percent of the processed output, and the cake is used to manufacture animal feed. Most poultry farmers rely on soyabean for their feed processing locally to feed their birds and complained of low level of domestic soya bean production for support their birds feed production.
- The poultry farmers noted that the industry alone requires about 75% of the total soya bean demanded annually in Ghana which is consistent with literature (Gage et al. 2012). The expansion in the processing of soybean will allow poultry and aquaculture producers to substitute imported feeds with a local alternative.
- It's also evident from the FGD that project interventions have built the capacity of women in processing soyabeans into nutritious meals for the family especially children to increase their dietary needs
- An interaction with some soyabean processors shows that they are faced with inadequate capital required for investing into appropriate technologies to meet the demand in the market.
- The feed millers such as Darko Farms in Kumasi indicated that there is market for their product and any support to help them acquire new equipment and buy soyabean for processing will increase the local production of feed to support the poultry and the aquaculture industry of which feeds is a major component.

Agriculture Funding Mechanisms

— *findings of our research*

Funding Mechanisms | Grant and Subsidies

In recent times, grant and trade credits are the most adopted tool by the government of Ghana in achieving various agricultural objectives

Overview

Subsidies (seed subsidies and interest rate subsidies)

- A subsidy is a direct or indirect payment, economic concession, cost reduction or privilege granted by a government to private firms, households, or other governmental units in order to promote a public objective.
- Subsidies to agriculture value chain have been phenomenal in Ghana as well as other countries on the grounds that preservation or expansion of this industry, even at a cost to the general public, is in the public interest. Farmers receive free inputs, reduced input costs, among other benefits.

Grant

- Although the terms "subsidy" and "grant" are often used interchangeably, a distinction can be made between them. Grant is a type of subsidy but not the same as subsidy. Whereas subsidies are current payments (products, inputs or cash) aiming to influence levels of production or prices, grants are direct financial contributions for specific activities that support the policy objectives of the grantor.
- Grants are therefore direct cash or monies that usually do not have to be repaid but are to be used for defined purposes.

Historical and recent examples of contract farming

Revitalization of Enterprises Support (Ghana CARES)

- The Government of Ghana implemented the Ghana COVID-19 Alleviation and Revitalization of Enterprises Support (Ghana CARES) programme as its response to mitigate the impact of the COVID-19 pandemic on the lives and livelihoods of Ghanaians in 2021.
- The programme identified agriculture as one of the critical sectors that has the capacity to revitalize and transform the Ghanaian economy.
- The project provided interest rate subsidy (IRS) to private actors in the rice, tomato, poultry and soyabean value chains in support of Government's import substitution agenda. The Government, through the Ministry of Food and Agriculture(MoFA) in collaboration with Ghana Incentive-Based Risk Sharing System for Agricultural Lending (GIRSAL) partnered financial institutions to implement this intervention. Beneficiaries enjoyed 50% subsidy on selected financial institutions' interest charges for loans advanced to qualified agribusinesses.
- The Ghana CARES policy also sought to assist broiler farmers and other actors along the chicken meat value chain to bridge the gap between the chicken meat demand and supply, to eliminate imports. From our research, about 160 producers benefited from a 50% interest rate subsidy and a 50% input subsidy for day-old-chicks, feed, and veterinary drugs/vaccines.
- Speaking to some of the participating banks including Absa Bank and ADB, we noted that the interest rate subsidy did not influence the banks to ignore their internal credit risk assessment processes. Parties to the subsidy scheme had to apply for the loan facility for the standard credit assessment and approval before being admitted into the scheme. Therefore, the credit subsidy scheme did not increase the access to loans by farmers but only reduced the burden of the cost of the loan to farmers.

Funding Mechanisms | Grant and Subsidies

In recent times, grant and trade credits are the most adopted tool by the government of Ghana in achieving various agricultural objectives

Historical and recent examples of contract farming

The Planting for Food and Jobs (PFJ) Inputs Subsidy Program

- Planting for Food and Jobs (PFJ) is Ghana's flagship program for agricultural transformation and employment creation in the country. Through the provision of subsidized fertilizer, hybrid and open-pollinated seeds and other planting materials, improved extension services, and marketing support to smallholder farmers across the country, the program aims to increase food production of priority crops, such as maize, rice, sorghum, soyabean, cassava, and vegetables, and to provide employment opportunities within and outside of the agricultural sector.
- Speaking to the secretariat of the PFJ program, we noted that the overall goal of the PFJ program was to promote food security, employment, and poverty reduction through transformation of the agricultural sector.
- The implementation of PFJ is based on five main pillars: (i) seed access and development, (ii) fertilizer access and fertilizer systems development, (iii) extension services, (iv) marketing, and (v) e-Agriculture. The program is expected to enhance public[1]private partnership, raise productivity and farm incomes, and create jobs along the different value chains.
- The program was originally designed to be implemented over four years, from 2017 to 2020, with a total estimated cost of GH¢3.3 billion ($718 million). The nationwide fertilizer subsidy component of the PFJ was estimated to cost GH¢1.8 billion ($401 million) over four years (2017-2020).
- Owing to the perceived success of the PFJ, its implementation was extended beyond 2020. In 2021, the GOG spent an amount of $70 million to fund the program but at a reduced input subsidy rate of less than 30%. And in 2022, the government is spent $98 million on the program, an increase in funding of 40% over that of 2021.

Historical and recent examples of contract farming

The Planting for Food and Jobs (PFJ) Inputs Subsidy Program

- Preceding the PFJ, there was a national crop farming support program dubbed the Fertilizer Subsidy Program (FSP).
- From our research, the impact of the FSP on accessibility and adoption by smallholder farmers is very limited. Most smallholder farmers targeted by the program still could not afford to pay even the subsidized price of the fertilizers. Thus, large commercial and well-to-do farmers became the only beneficiaries.
- The PFJ's fertilizer-subsidy program, in addition to a 50% subsidy on the price of fertilizers (nitrogen, phosphorus, potassium - NPK, urea, sulphate of ammonia, and bio-fertilizer), included a novel option that encouraged fertilizer intake by farmers, especially by smallholders, whose incomes were low and whose resources for purchasing agricultural inputs were limited. Specifically, the program provided eligible farmers with a 50% subsidy, allowing them to pay 25% of the fertilizer price as a down payment, with another 25% due after the harvest. If beneficiaries failed to pay the remaining 25% of the fertilizer price for two consecutive planting seasons, they would become ineligible and be removed from the program until they settled their debt. Additionally, to prevent misuse, each eligible farmer was entitled to no more than six bags of bio-fertilizer to produce soybeans, ten bags of NPK, and five bags of urea or sulphate of ammonia for other crops, which corresponded to a maximum fertilized crop area of two hectares per farmer.

Funding Mechanisms | Grant and Subsidies

In recent times, grant and trade credits are the most adopted tool by the government of Ghana in achieving various agricultural objectives

Historical and recent examples of contract farming

The Planting for Food and Jobs (PFJ) Inputs Subsidy Program

- The Planting for Food and Jobs program had targets of increasing the 2016 production levels of corn by 30 percent from 1,722,000MT to 2,238,600MT; rice (paddy) by 49 percent from 688,000MT to 1,025,120MT; soybean by 25 percent from 143,000MT to 178,750MT; and sorghum by 28 percent from 230,000MT to 294,400MT, all within the program period of four years.
- At the end of the original program period, the 2020/2021 crop production figures for corn (3,031,691MT), paddy rice (986,905MT), soybean (202,243MT), and sorghum (345,421MT) indicated that all the targets were realized except for rice.
- The program is deemed to have improved food security, reduced poverty, and ensured the availability of selected food crops on the market as well as providing job opportunities within the agribusiness value chain. Content with the gains, the GOG extended the PFJ program beyond 2020.
- However, the subsidy rates were considerably reduced in 2021.

Perceived Impact

- The initiative, currently in its seventh year of implementation, is perceived by the GOG to have enabled greater community participation in agricultural activities and through agricultural incentives, attract greater private sector investments.
- The program has been deemed to have increased the capacities of smallholder farmers to profitably produce food and other crops to supply growing domestic and sub-regional markets with foodstuffs and non-food crop products.

Historical and recent examples of contract farming

Savannah Zone Agricultural Productivity Improvement Project (SAPIP)

- The Savannah Zone Agricultural Productivity Improvement Project (SAZAPIP) was approved on 15 December 2017 to transform agricultural value chains for food and nutrition security in the Northern Savannah Zone of Ghana. This Grant and Subsidy project was expected to increase farmers' food and nutrition security and incomes through increased agricultural productivity and diversification; and to enhance the creation and strengthening of agribusinesses to increase incomes of actors along selected value chains on a sustainable basis. It was been designed within the context of the Ghana Shared Growth and Development Agenda II (GSGDA II).
- The SAZAPIP was implemented in 2018 and is expected to end in September 2023.
- The direct beneficiaries of this grant and subsidy project is estimated to be about 50,000 economically active smallholders living in the selected agro-processing zones; and the processing firms that serve as a direct market for the farmers. The indirect beneficiaries include the entire population (consumers) that benefited from the availability of food and business associations who provide services to the producers and processors. This number is expected to increase significantly when other economically active value chain entrepreneurs get involved in the Project. Among the target group, women and youth play a major role in crop production, processing, small enterprises operation and marketing. About 50% of beneficiaries (women) were specifically targeted in the project's activities and are reaping diverse benefits.

Funding Mechanisms | Outgrower Scheme / Contract farming

Over the years, contract farming has spread widely in developing countries, as a potentially viable model for coordinating production and ensuring higher-quality, safer food and lower production and marketing costs (UNCTAD, 20093).

Overview of outgrower scheme

- Outgrower farming, also known as contract farming, is often referred to as the production of an agricultural commodity conducted with a pre-plant agreement between a farmer and a buyer in which the farmer commits to producing a certain product in a certain manner and the buyer commits to purchasing this product (Minot & Sawyer, 2016).
- Under the scheme, the buyer usually provides major farming inputs (like seed, fertilizer, agrochemicals), credit, and/or technical assistance to contract farmers. Thus, outgrower farming is often seen as an immediate institutional arrangement that may allow enterprises to participate in, and control, the process of production without owning or operating the farms (Key & Runsten).
- Outgrower farming as an inclusive business model may provide a feasible solution for farmers and other dealers of the various value chains of the selected products. As a forward agreement, contract farming assures farmers of a market even before sowing. For example, processors can count on raw material supplies at an early stage of planning the processing season.
- The contract entails that farmers are obliged to supply the volumes and qualities as specified and the off-taker is obliged to buy the produce and realise payments as agreed. Furthermore, the off-taker normally provides reliable timely access to seeds, fertilisers and finance to farmers through either embedded services, pre-financing or inclusion of serice providers in the agreement.
- Other services, such as extension, training, transport and logistics might also be included. To be successful, contract farming requires a well thought through business model, transparent negotiations and competent day-to-day management to assure mutual benefits (‘win-win’) motivating farmers and millers to engage and comply with the contracts.

Overview of outgrower scheme

- We noted a few previous studies that investigated effects of contract farming on food security. Bellemare and Novak (2017) showed that contract farming contributes to a shortening of the hunger period for smallholder households in Madagascar. Mishra et al. (2018) found that households producing onions under contract in India have higher food expenditures than their counterparts without a contract. Soullier and Moustier (2018) showed that rice contracts in Senegal improve food security through mitigating price seasonality.
- Studies such as Ragasa et al. (Citation2017) suggest that smallholder farmers’ participation in outgrower schemes can be a good measure for policy analysis to examine the efficacy of agriculture inputs or credit delivery to farmers. Hussain and Thapa (Citation2016) for instance, found that participation in nucleus farmer-outgrower schemes tend to relax credit fungibility and improve credit repayment. This is due to the direct interpersonal relationship with the creditors (nucleus farmers) and borrowers (outgrower farmers).
- Proponents of contract outgrower scheme see contract farming as a means of: 1) linking smallholder farmers to expanding local and export markets, thus solving some of challenges faced by smallholders (Baumann, 2000) and 2i) mobilizing foreign direct investment (FDI) to agriculture, to promote and support more inclusive business models with smallholders.
- Over the years, contract farming has spread widely in developing countries, as a potentially viable model for coordinating production and ensuring higher-quality, safer food and lower production and marketing costs (UNCTAD, 2009). Contract farming has also been used in rural development strategies such as providing a secure market and fixed prices necessary for sustainable crop intensification (Vermeulen et al, 20064). Such arrangements have the potential for securing markets for some crops, particularly those that need processing and may otherwise not be produced.

Funding Mechanisms | Outgrower Scheme / Contract farming

According to GIZ, FYSSO's outgrower food productivity increased largely due to the timely delivery of quality inputs by the sponsors of the scheme. Most farmers boosted yields from 1.5 tonnes in 2014 up to 5.3 tonnes per hectare in 2017

Historical and recent examples of contract farming

FYSSO's Outgrower model

- FYSSO Ghana is a social enterprise with the aim to assist rural communities to gain access to capital and entrepreneurial skills to grow rural businesses and increase household incomes. According to the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, the contract farming business model operated by FYSSO Ghana from 2014 to 2017 linked 4,663 farmers, including 1,617 female farmers organized in 200 Farmer Based Organisations (FBOs) with three small-sized rice mills.
- FYSSO Ghana signed contracts with the FBOs on one side and the millers on the other. The FBOs and their members were supported with embedded services, such as technical training (Good Agricultural Practices, Farmer Business School etc.) and advisory services. Furthermore, FYSSO Ghana facilitated access to finance through its own micro-finance system by supporting Village Savings and Loans (VSL) groups. It also used the contracts with the millers to secure loans from other financial institutions. The farmers could use the credits provided to buy inputs (e.g. quality seed, fertilisers) or pay for operational services (e.g. land preparation, harvesting). FYSSO Ghana identified appropriate service providers to assure quality products and negotiated favourable prices for the services provided (for instance, some farmers received discounts for bulk purchase).
- The FBOs committed to supply the production of 30 hectares from member-farms to FYSSO Ghana. This volume represented the counter value of embedded financial and other services provided by traditional credit providers. FBOs that produce rice on more than 30 hectares are free to sell the produce to FYSSO Ghana or any other buyer.

Historical and recent examples of contract farming

FYSSO's Outgrower model (Cont.)

- According to GIZ, farmers confirmed that the productivity of farmers under the FYSSO outgrower scheme increased largely due to the timely delivery of quality inputs by the sponsors of the scheme. Most farmers boosted yields from 1.5 tonnes in 2014 up to 5.3 tonnes per hectare in 2017. This motivated many farmers to increase the area under production of rice from 1 hectare to sometimes 3 hectares. Millers were guaranteed a timely supply of quality paddy rice for processing and storage.

Guinness Sorghum Outgrower Project

- We noted from our research that In 2001, a non-profit business organization, TechnoServe (TNS), promoted the development of a sorghum supply chain and initiated the Guinness Sorghum Project. The main objective was to increase the productivity and incomes of sorghum farmers mainly through: i) improving high-yielding sorghum varieties; ii) establishing seed multiplication farms and sorghum collection centers; and iii) developing and training sorghum producers.
- The project's initiating and implementing partner, TNS, selected the value chain and nucleus farmers before approaching the Ghana Guinness Breweries Limited (GGBL) as the final buyer. GGBL provided the market for harvested sorghum that meets quality specifications.
- Other stakeholders involved in the scheme were:
    - i) Savannah Agricultural Research Institute (SARI), which provides agronomical support;
    - ii) ii) service providers, including credit providers, input suppliers, transporters, tractor owners and operators, warehouse operators and cleaning centres.

Funding Mechanisms | Outgrower Scheme / Contract farming

There are evidences of successful outgrower / contract farm schemes in Ghana but the most significant issue is that most of them have not yet been sustainable

Historical and recent examples of contract farming

Guinness Sorghum Outgrower Project

- The Guinness Sorghum Project made significant impact in its diverse stakeholders in the following ways:
    - ***Farmers:*** According to the evaluators of the project, the farmers evaluated the project positively and were happy with their participation. The farmers acknowledged the introduction of high yielding varieties, training received on agricultural practices such as land selection, land preparation, correct planting distances, thinning and provision of credit facility as some of the benefits they enjoyed from their participation in the project. They were all unanimous in acknowledging an increase in their incomes through cultivation of sorghum. The increase in income is estimated to be about 40%.
    - ***Technoserve:*** The evaluators maintained that Technoserve was glad about the application of improved technologies such as introduction of hybrids which yielded of 3 to 3.5 tons per hectare compared to 1 to 1.5 tons per hectare of the normal sorghum varieties.
    - ***Guinness Ghana Breweries Ltd:*** The tremendous increase in sorghum grain production and supply was well acknowledged by Guinness at the evaluation level.
    - ***Dizengoff Ghana Ltd:*** Dizengoff supplied agro chemicals such as fertilizers, pesticides and herbicides to the farmers. The company reported that it provided support to farmers by way of advice to nucleus farmers on the use of their products. They also monitored the use of the chemicals and the response on the field. Their chemicals were provided at dealer prices. Their assessment of the project was recorded as profitable.

Historical and recent examples of contract farming

Ghana Rubber Estates Limited (GREL) Outgrower scheme

- The GREL outgrower scheme had a tripartite structure of: financial operators – the Agricultural Development Bank (ADB) and the National Investment Bank of Ghana (NIB); GREL, providing technical assistance and planting material; and the Rubber Outgrowers' and Agents' Association (ROAA).
- GREL and each individual farmer entered into a tripartite agreement with the banks to finance the plantation. GREL funded 50% of the technical assistance from its own resources and charged the balance to farmers, deducting it from the payments it makes for their rubber.
- Farmers' representatives engaged in annual price negotiations with GREL.
- It is believed that through the outgrower scheme, the rubber farmers increased both their production and their productivity, achieving a significant yield increase from 0.8 tonnes/ha t o 2 tonnes/ha. This was the result of the adoption of improved agricultural and management practices and access to improved planting material and efficient technical assistance. Income levels was said to have increased considerably.
- Important benefits of this contractual arrangement were:
    - It provided good-quality rubber tree seedlings.
    - It provided training and technical advice on sustainable agricultural practices and financial matters (record-keeping, farm budgeting and cost analysis).
    - It organizes bulk purchase of fertilizers, which it resells to outgrowers at the bulk rates it paid for them.
    - It links farmers to bank loans with reduced interest rates.

Funding Mechanisms | Outgrower Scheme / Contract farming

Contract farming has been subject to intense debates regarding its role in development agriculture in Africa. Opponents have their say while the proponents continue to elucidate their stands

Benefits of Ougrower Scheme

- Inputs and production services are often supplied by the company. This is usually done on credit through advances from the investor.
- Contract farming can introduce new technology and enable farmers to learn new skills.
- Farmers' price risk is often reduced as some contracts specify prices in advance.
- Such schemes can provide higher incomes. A study in Zambia concluded that out-growers achieve higher incomes in comparison to non out-grower households but not enough to take households out of poverty.
- Contract farming can open up new markets which would otherwise be unavailable to small farmers. A study of one sunflower project in Tanzania concludes that production increased and that farmers secured better access to markets. (Sunflower Value Chain Development in Tanzania: The Case of SHADECO in Village Based Contract Farming Arrangement in Iringa Region – Tanzania).
- The justification of Outgrower farming is that under this scheme, holders are meant to keep control of their land so the companies promoting contract farming can escape the accusations of displacing farmers and avoid the risk of being seen to exploit farmers through plantations.
- The Food and Agriculture Organization (FAO) notes that "contract farming with small farmers is more politically acceptable than state farms as contract farming is less likely to be subject to political criticism.
- Contract farming enhances long term planning on both sponsors and farmers.
- Farmers can also use the contract agreement as collateral to arrange credit with a commercial bank in order to fund inputs.

Limitations of Outgrower Scheme

- Working with large numbers of smallholder farmers is generally perceived to be high risk due to the number of outgrower initiatives that have failed in the past. Sustainability of outgrower schemes is a major challenge in Ghana as all the examples of outgrower schemes we have highlighted in the previous pages of this report did not stand the test of time, irrespective of the perceived success. In short, the schemes do not exist. Sustainability of these outgrower schemes will depend on, from the consultant's perspective, minimizing the costs to run and monitor them.
- Sometimes, yields are not high enough to compensate for high input costs of the outgrower schemes. Developing and promoting much-improved varieties and technologies that may lead to a jump in yields and gross margins is the key approach to curtail this problem.
- If the scheme is operated by a market player like the Akate Farms Outgrower scheme, it can make the player a Signficant Market Player (SMP). In every market, SMPs hinders the growth of smaller and medium size players.
- Outgrower farming schemes often exclude the poorest farmers – the landless, marginal and subsistence farmers and women. The poor are excluded because, research has found that this is only successful for 2-10% of small-scale producers and that only 5% have the resources and capital to integrate into such value chains (Seville, D., Buxton, A. and B. Vorley, 2011).
- Farmers' freedom is curtailed as they do not have the rights to do what they think is right but will have to follow the terms and conditions stipulated in the agreement. Sometimes, farmers are not able to sell the produced crops if it does not meet the standard of quality which has been set during the time of the arrangement.
- It is always tough or impossible for the farmers to bargain the produce for a price that is reasonable at the time of harvest or selling.

Funding Mechanisms | Credit Guarantees

Credit guarantee has become very popular in Ghana largely due to its benefit of covering all sectors of the agriculture value chain

Overview of Credit Guarantee Scheme

- Credit guarantee is an arrangement that gives the lender a bit of comfort that part or all the loan given will be repaid. We have highlighted two types of credit guarantee schemes below:
    - **Institutional Guarantee:** Credit Guarantee Institutions are Non-bank Financial Institutions (NBFIs) aimed at facilitating the access to formal lending through the provision of credit guarantees that mitigate the risk of non-repayment. These facilities partially guarantee the loans of commercial bank partners to reduce the risk and increase their willingness to lend to farmers and other actors of agricultural value chain. Investing in small and medium-sized businesses through Loan Guarantee Facilities helps to diversify and strengthen developing economies and provides incentives to commercial banks to begin lending in new and emerging markets.
    - **Group Credit:** This is a unique financial service for all members of the agricultural value chain, particularly, low-income farmers. To obtain such a loan or credit, it is necessary to form a group of three or more individuals. The group members guarantee each other's loan repayment, therefore, each member will be equally liable for repayment, hence, collateral is not necessary. The group members are expected to do their best not to let each other down in loan repayment, since usually they are business colleagues, neighbors or relatives.

Applicable Actors of the various value chains

- Institutional Guarantee – Highly applicable to large and medium size actors
- Group Credit – Applicable to all actors of the various value chain, particularly, small-size actors.

Historical and recent examples of contract farming

Agricultural Credit Risk Guarantee Scheme

- GIRSAL's Credit Risk Guarantee Scheme provides participating financial institutions with up to 70% credit risk guarantee on agricultural loans. The scheme mitigates agricultural lending risks and provides an incentive for financial institutions to lend more to agribusinesses.
- Banks, Specialized Deposit-Taking Institutions, Non-Bank-Financial Institutions, Rural, Community Banks, and other qualifying financial institutions are eligible to participate in GIRSAL's Credit Guarantee scheme.

Fidelity Young Entrepreneurs Initiative (FYEI)

- The Fidelity Young Entrepreneur's Initiative (FYEI) launched in March 2021 is Fidelity Bank's GHS 10 Million initiative which seeks to provide both financial and nonfinancial resources to enable youth-related businesses to survive and thrive. The initiative provides seed capital/soft loans at concessionary rates (10%) with flexible repayment terms back by business management training support to the beneficiary businesses.
- As a partner, GIRSAL supports this initiative by providing a 70% credit guarantee cover to qualified agricultural loans at a reduced CRG fee. Most of the targeted agribusinesses that benefit from the project do not have the required security to receive credit from the bank since they are mostly posted profit start-ups. Hence, the GIRSAL guarantee is valuable security to the bank.
- According the GIRSAL, the FYEI provides guarantee to even small or medium size young entrepreneurs of which they recently provided guarantee for 70% of a credit facility of as low as GHS 40,000 (US$ 3,350).
- Most of the targeted agribusinesses that benefit from the project do not have the required security to receive credit from the bank since they are mostly posted profit start-ups. Hence, the GIRSAL guarantee is valuable security to the bank.

Funding Mechanisms | Credit Guarantees

Credit guarantees enable farmers to get more flexible and diverse loans which would have ordinarily been impossible.

Historical and recent examples

Financial Institutional Group Credit Scheme

- Advanced Ghana, a private Microfinance Company in Ghana has Group Loan Scheme for its customers.
- Agricultural Development Bank Ltd provides Group loan scheme for its members.

The Rural Enterprise Agribusiness Promotion Project (REAP)

- The Rural Enterprise Agribusiness Promotion Project (REAP) is a CARE program in Kenya that helps small farmers gain access to markets through a range of services and interventions, including the use of credit guarantees. Smallholder farmers are organized into legally registered production units with their own management capacity. The donor-supported REAP program provides resources to help the farmers establish irrigation infrastructure, and offers input supply and technical assistance to enable them to deliver produce that meets export market standards.
- A Central Management Unit (CMU), created by the REAP project, provides services to the production units for a management fee. These services include technical production assistance, negotiating input and output market links (farmer units sell through the market system, not through the project), and facilitating access to credit. The CMU runs a loan fund (the “Input Supply Loan Fund”), which either directly provides loans to farmer units or guarantees credit from private-sector buyers and processors. The REAP example further illustrates the potential of grouping small farmers into cohesive units or associations, and also serves to emphasize the close relationship between financial and nonfinancial services in agriculture. Non-financial technical and advisory services are needed to improve the attractiveness of small farmers to credit providers.

Historical and recent examples

- While non-financial and financial services are both necessary for agricultural lending to be viable, they should be operationally separated in order to improve efficiency, transparency, scale, and the range of financial services available to small farmers.

Funding Mechanisms | Credit Guarantees

By far, the group lending seems like the perfect solutions to problem of poverty in rural areas. Muhammad Yunus, the leader of the Grameen Bank, was even awarded the Nobel Peace Prize for his devotion to the group lending

Advantages of Group Lending (a type of Credit Guarantee Scheme)

Mitigates adverse selection

- It is believed that the group loan can solve the problems of adverse selection. The adverse selection problem happens when lenders cannot distinguish inherently risky borrowers from safe borrowers. In the group lending, the potential debtors will make full use of their information to find the most suitable members.

Overcoming the moral hazard of borrowers

- Group members who often live and work closely together can impose social or economic sanctions on each other, sanctions that are impossible for an outside bank to impose (Zhang and Chen, 2003). In a group, if one is not willing to repay, the other members will blame him because their loans will be affected negatively. Under heavy peer pressure, the members would repay timely since they are dependent on the community to large extent. Meanwhile, living in the same community with high frequency of daily interactions, the members can help and supervise each other effectively.

Lower interest rate

- According to a survey conducted by International Bank of Reconstruction and Development, those farmers who do not participate in group lending need to pay for interest rate up to 18%, while those who do only need to pay for 2.5%. Many farmers are only using the available capital saved by group lending to engage in commercial activities, increasing their income to large extent.
- For example, research has shown that, group lending in India lowers the interest of loan. Before the introduction of group lending in India, when the poor farmers were in need of capital in agricultural production, they would turn to the local lenders who always ask for high interest rate.

Disadvantages of Group Lending (a type of Credit Guarantee Scheme)

Lack of proper punishment

- Punishment is one of the key issues of the effectiveness of the group loan. But in the rural places where people are too familiar with each other, in cities where people are too unfamiliar and in the places where law enforcement is absent, the punishment is hard to impose (Jiang, 2012). Without effective punishment, the group lending will fail to gain sustainability, which is the foundation of long-term operation of group lending.

Cost of supervision may be too high

- Group lending is to transfer the responsibility of the banks to the members of groups. But if the members believe that the cost of time and energy to supervise is too high, they would decide to quit. That is, when the return of collaboration outnumbers the cost of collaboration, the farmers who are in need of loans will develop the mode of warranty between households. However, if they believe that the cost outnumbers the return, they have no incentives to join group lending.

Lack of incentives

- According to the regulation of group loan, the members assume not only their own responsibilities, but also others, so it may bring more risk to the members. If the members are risk-averse, they may be unwilling to shoulder the duty. This poses serious problem to group lending, since if the farmers are not willing to participate in the program, they cannot enjoy the advantages of group lending (Zhou and Li, 2010).

Funding Mechanisms | Village Savings and Loan Association

The Village Savings and Loans Association is not a financial institution but an association. Savings are kept in a metal box well secured and in the custody of the treasurer or deposited to a mobile money or a nearby bank.

Overview of Village Savings and Loan Association

- The Village Savings and Loan Association (VSLA) is a group of people, usually 5-30, who meet regularly to save together and take small loans from these savings. The model is believed to have been developed by Care International in Niger in 1990, Community-managed savings-led approaches to financial services for the poor in a group. The model focuses on savings, asset building and the provision of credit proportionate to the needs and repayment capacities of the borrowers. The cost of formation and management is low, simple to manage and can be seen as a first step for people in their quest for more formal and wider range of financial services.
- The group can considerably raise the self-respect of individual members; build up social capital among the participants, particularly among women who represent more than 70% of members. While the membership could be open to every adult member of community, the concept has evolve to have a specific group of workers forming the group, say farmers, traders etc. Self-selection of adult population is usually the way by which membership statuses are attained and is membership is open both to women and to men but can also be all-male or all-female group with the latter being the most common. The activities of the group run in cycles of one year, after which the accumulated savings and the loan profits are distributed back to the members. The purpose of a VSLA is to provide simple savings and loan facilities in a community that does not have easy access to formal financial services.
- A VSLA is a transparent, democratic and structured version of the informal Savings Groups found in many parts of the developing world. The VSLA concept emphasizes accountable governance, standard procedures and simple accounting system and ethics that everyone can understand and trust.

Overview of Village Savings and Loan Association

- In terms of organizational structure, the Groups hold annual elections based on their 'constitution' or byelaws'. The responsibilities of the three or five-person management committee are clearly defined.
- This is to protect the group from being dominated by a single individual. Groups meet weekly and members save through the purchase of shares. The price of a share is decided by the group. At each meeting, every member must buy between 1 and 5 shares. The share price is set by the group at the beginning of the annual cycle and is fixed for that cycle. Members do not have to save in equal amounts; these can vary at each meeting. Additionally, by saving more frequently in very small amounts, they can build their savings more easily, contributing to improving the security of the household.
- Savings are kept in a metal box well secured and in the custody of the treasurer or deposited to a mobile money or a nearby bank. Members are allowed to borrow in small amounts, up to three times the value of their savings. Loans are for a maximum period of three-six months based on the economic activities and may be repaid in flexible instalments at a monthly service charge (interest) determined by the group. This flexible repayment system is a decisive advantage when compared to the rigid repayment demands of Micro finance institutions/rural banks and other formal financial service providers.

Funding Mechanisms | Village Savings and Loan Association

The evaluations of existing projects show that the VSAL model used by the project was very successful. The World Cocoa Foundation is also using VSLA on most of its interventions in Ghana.

Overview of Village Savings and Loan Association

- At the end of every annual cycle (year), all of the loans are paid back and the total money is shared out among members in proportion to their savings. This share-out includes all of the profits of the group from interest income and fines. Any member who wants to can then plough this money immediately back into the group, so that they start a new cycle with a large balance, which makes them quickly eligible for a large loan. Records are maintained in members' passbooks. Savings are recorded at each meeting. Record-keepers also maintain records cash balances. All of the member passbooks are locked in the cash box between meetings.

- *The VSLAs agree on a set of rules, or a constitution, to guide their activities. The regulations are written in to the association's constitutions (sometimes called by-laws) and are intended to provide authority to the committee members.*

- To ensure repayment of loans, a member who is in good-standing without any loan can guarantee for a loan and in that case the loan amount needs not be more than three times the loan value applied for. In terms of loan repayment, it is mostly done quarterly when the date is due or tied to the production cycle. However, members are entreated to repay monthly if possible. Sometimes, it is mandatory to make the interest payments on the loans contracted every month. VSLAs keep in place certain mechanisms to guarantee repayment by employing share out of members who are unable to repay, or the group holds the guarantor responsible at the close of the cycle.

The Viability of the Village Savings and Loan Association

- The viability of VSLA has been tested by several organization adopting the model to provide financial services to the various group of people including farmers in several country including India, Ghana and other developing country. Several organizations (including Care International, have use VSLA model in Ghana to help farmers and evaluation of such project gave shown that VSLA is a viable financing sources to agriculture among rural poor farmers especially among women. It has been shown that since CARE international started promoting the VSLA in Africa including Ghana, Malawi, Mali, Mozambique, Rwanda, Uganda, Zambia, Zanzibar and Zimbabwe, the VSLA concept has grown to reach over18 African countries including Ghana.

- The viability of VSLA has been tested by J-Pal in a randomized control trail (RCT) conducted by Karlan et al 2016 in Ghana. They find that the promotion of VSLA as community-based microfinance group leads to an improvement in household business outcomes and women's empowerment in developing countries. The viability of the potency of VSLA is based on the fact VSLA facilitate investment in farm activities as at the right time as the long bureaucracy often encountered by formal credit is removed and hence money is made at available to the farm household the right time. Also, Karlan et al., (2016), found that VSLA leads to 24% increase in the profit of VLSA members and also increases access to financial by 44%. The VSLA works by making cash available to farmers at the bright time as it has no legal barriers to overcome.

- The viability of VLSA in Ghana has also been demonstrated to be a viable option based on it usage by other development program to help improve the livelihood of farmers. Project such as the Feed the Future Agricultural Development and Value Chain Enhancement project (FTF ADVANCE II) USAID, 2022 implemented by ACID/VOCA, the Greater Rural Opportunities for Women (GROW) Project Implemented by MEDA – Mennonite Economic Development Associates and Funded by Global Affairs Canada, MeDA, 2021.

Funding Mechanisms | Village Savings and Loan Association

While default is a key risk in and every agricultural credit/loan, the design of the FSRP-VSLA loan Scheme is such that the group determines is recovery criteria and modalities.

The Viability of the VSLA

- The results for the analysis of the qualitative data from the Focus group disunions also show that in almost all the Districts that we visited, VSLA is a tool being used by the community member use to access loan for the farm activities. They FGD suggested that the VLSA model is the most popular means of accessing loan for farming among smallholder poor farmers. VSLA is viable to provide women with the tools and resources they need to lift themselves and their families out of poverty. As a results of the viability of VSLA loan scheme, the VSLA concept have now been introduced in 72 countries and have 11million active participant's developing countries worldwide (Ksoll et al. 2016) .
- VSLAs have been shown to be an effective way to organize farmer communities and increase their economic stability especially among women (Hinson et al., 2017). It was revealed by Mwansakilwa et al. (2017) that VSLAs increased welfare levels in the short term, even though it has long-term implications on productivity. The idea is that increased access to credit through savings will likely increase households' economic activities and minimize unnecessary expenditure and hence resuscitate their latent potential to further improve welfare. VSLAs assist rural farmers and households to acquire key agricultural inputs that will improve agricultural output.
- In addition to savings, VSLA membership has improves participants' capacity to afford essential items, such as food, health services and school fee. VSLA improves the empowerment of women as it help them to make decision without having to depend on some other people as they are able to get the resources that help them to crystalize their decisions in actions and not only intents.
- The current VSAL requires no external capital and no legal infrastructure to issue and collect loans and is, in fact, similar to existing informal mechanisms. This informal mechanism need to be formalized to be able to provide financial services in the form of loans to smallholder farmers by any formal service provider. There is therefore the need to register the VSLA as a community based group by the Cooperative Society to gain the needed formal recognition.
- The Group after foam registration is done, the group is then assisted to open bank accounts and apply for a loan officially. The money is loaned to the VSLA group and they use their bylaws to administer the disbursements of the loan. New VSLA are not qualified for this type of loan and the interest rate must not differ from the interest rate that the VSLA has being operating with. From the from the field, most of the VSLA operate between 10-15% simple interest rate per annum. Note that the loan is given to the VSLA group and the VSLA also loan to its members a rate they decide but must be at least more than that the bank or the project provided them. With this the group is also able to make a margin and earned interest for the group.

Risks analysis of the proposed VSLA Scheme

- The main risk of the proposed model is that the group is not a most VSLA are not formal group because they are not registered. The VSLA no legal infrastructure to issue and collect loans but if well manage can yield results. The risk can be minimized by stating this function of issuing loans and recovering same. Also, the byelaws of the VSLA can be approved by the District Assembly to gain legitimacy. Even though the risk of the members being low educated could lead to poor records management and calculation of interest, the use of simple interest minimize the risk of wrong interest calculation.

Funding Mechanisms | Warehouse receipt

The warehouse receipt can be used as a collateral to secure loan / credit from a financial institution

Overview of Warehouse receipt scheme

- A warehouse receipt is a financial instrument which certifies that a certain quantity and quality of a commodity has been deposited in a very secure warehouse. In other words, the warehouse receipts system (WRS) is a process where farmers deposit their products in certified warehouses. After weighing the amount of product brought into the warehouse, the farmer is then issued with a warehouse receipt as proof of ownership.
- The warehouse receipt system can then facilitate credit from local banks for the products held in storage. These receipts, when backed by legal provisions that guarantee quality, provide a secure system whereby stored agricultural products can serve as collateral, be sold, traded or used for delivery against financial instruments. The system is mostly used by large processors, importers and exporters to secure loans for their transactions, and it is unavailable to smallholder farmers who suffer most from financial exclusion due to lack of collateral.
- A warehouse receipt system gives the value chain participant who "owns" the inventory, often a commodity, access to both secure storage and credit. Place the item in storage and use it as security for a loan from a lending organization. The receipt demonstrates that the goods are physically in the warehouse and secure and safe since they are kept in a licensed warehouse. In contrast to traditional lending, where the underlying collateral is just a secondary source of repayment that must be mobilized when something goes wrong, this receipt acts as the guarantee or collateral foundation for financing. Hence, it serves as the primary means of repayment in collateralized commodities loans.

Historical and recent examples of warehouse receipt scheme

Ghana Commodity Exchange

- WRF is being implemented in Ghana by International Finance Corporation (IFC) and the Ghana Commodity Exchange in a Project called the IFC Ghana Warehouse Receipt System (WRS) Project. The Project is being implemented in collaboration with the Ghana Commodity Exchange (GCX) in nine regions of the country with financial support from Switzerland's State Secretariat for Economic Affairs (SECO). It is a technical assistance and advisory services project aimed at setting up a well-functioning regulated WRS that is expected to facilitate an increased access to credit to farmers and the supply chain, linkage to structured markets and reduce post-harvest storage losses.

Ghana Grains Council

- The Ghana Grains Council (GGC) is also implementing warehouse receipt financing. The GGC is a private sector organization comprising of grain value chain actors, including farmers, warehouse operators, agro-food processors, financial institutions, commodity marketers. In 2012, the GGC launched the first Regulated Warehouse Receipt in Ghana through the support of USAID under the Ghana Agricultural Development Value Chain Enhancement Program (ADVANCE).

Zambian Agricultural Commodity Agency

- A stakeholder-controlled agency, the Zambian Agricultural Commodity Agency Ltd (ZACA), which is at arms' length from Government, has been established to certify and oversee warehouses, primarily to ensure that its integrity is not compromised by ad hoc political intervention in staffing, and in the issuing and revocation of warehousing licenses.

Funding Mechanisms | Warehouse receipt

The warehouse financing model provides several Benefits to various stakeholders. Both suppliers and buyers have more financing at the farmer level, and agribusiness companies have easier access to funding based on the strength of clients and purchases/sales.

Benefits of warehouse receipt scheme

- It facilitate trading because the warehouse operator is able to provide information on inventories available and on demand from major buyers at little or no cost. He also guarantees delivery commodities matching stated and against date contracts. This is likely to benefit smallholders who can bulk up their crops and sell further down the marketing chain to large traders, processors and to regional markets for a better price. Smallholder farmers able to participate in a modern and efficient commodity market because the system encourages them to comply with commodity standards, which will also curtail cheating on weights and quality.
- The use of warehouses as delivery locations will allow transparent trade in agricultural commodities to develop—between producers and large traders or processors— thereby reducing the length of the marketing chain and narrowing distribution margins. Producers are also able to defer the sale of produce by making use of inventory credit to satisfy immediate consumption needs. Increased storage by participants in the commodity system will moderate seasonal price variability and reduce trade margins for the benefit of both producers and consumers. Storage will also occur in well-run warehouses or silos, thereby reducing post-harvest losses, which are quite substantial in SSA and often mean significant loss of income to farm households.
- Easing access to rural finance. A WR system will facilitate development of efficient and accessible rural financial systems. By attracting deposits from small farmers and traders, the system will help formalize their trade transactions, enabling a database on their activities to be generated, which will assist banks in evaluating loan requests. Lenders can mitigate credit risks using collateral (the stored produce), which is more readily available to the producer and of better quality than the traditional security that banks in Africa accept.

Benefits of a warehouse receipt scheme

- Availability risk, associated with movable collateral, is reduced by the warehouse operator's guarantee of delivery from a stated location, and foreclosure can be simple and low cost, without any resort to the courts, depending on the legal regime.17 Lenders can minimize the risk of loss of value of the collateral by monitoring movements in its market value and using margining and price risk management instruments (discussed in mitigating price risks section.
- Lenders no longer need to monitor a large number of small borrowers, but few warehouse operators to assure loan performance. This will reduce monitoring costs and encourage commercial lending to the rural sector, helping to capitalize the rural trade; and in turn, facilitating the development of a competitive national network of service providers in rural areas.
- Mitigating price risks. Producers in most developing countries lack the means to mitigate price risk, and this affects their income and ability to repay loans. A WR system will facilitate development of simple mechanisms by which producers, lenders and traders can secure a floor price by locking in a fixed future price.
- Furthermore, the model can reduce transaction costs of trade finance, such as allowing more use of open trade accounts which are less costly than secured ones.

Funding Mechanisms | Trade Credit

Trade credit may be useful in reducing transactions costs or in providing assurances about the quality of the supplier's products.

Overview of Trade Credit Scheme

- It is a type of commercial financing in which the customer is allowed to purchase goods or services and pay the supplier at a later scheduled date. Trade credit may provide access to capital for farmers that are unable to raise it through more traditional channels. Suppliers may be better than specialized financial institutions in evaluating and controlling the credit risk of their buyers.
- Traders use personal contacts and existing trading relationships as a substitute for collateral, and to reduce the risk of side-selling. Traders may insist on a year of largely cash-based transactions (often funded by moneylenders in the absence of product market credit) before offering credit to farmers, based on their observed performance.

Historical and recent examples

Trade Credit Guarantee Project

- Trade credit financing model is being implemented in Ghana through a project by OCP Africa with African Development bank as a Partner. The project is dubbed the Trade Credit Guarantee Project in Côte d'Ivoire and Ghana.
- Through the Agribooster initiative, the Africa Fertilizer Financing Mechanism (AFFM) and OCP Africa use an inclusive approach to provide farmers access to quality inputs, training, finance and market linkages in order to increase their yields, incomes and livelihoods.

Benefits of Trade Credit System

- Trade credit mitigates the misuse of the loans and improves the ability to repay
- Getting trade credit as a part of trading relationships helps to build loyalty and mutual dependence between the suppliers and the buyers, so trade creditors face less severe risks than credit institutions.
- It makes inputs available to resources poor farmers.

Limitations of Trade Credit System

- There is relevant risks remain because of the default from buyers who legitimately lack financial resources to repay and the deliberate non-repayment by buyers who hope to steal the owed credit. This asks for proper screening, tight monitoring and effective enforcement which are hard to get done due to a lack of information on buyers and the absence of court devices, while trade creditors make decisions based mostly on informal relationships.
- The supplier has an advantage over credit institutions with regard to evaluating and controlling risks facing the buyer. Indeed, the supplier obtains needed information at low costs via the normal course of business, visits to the buyer's premises and from other suppliers.
- The supplier is also better able to influence the buyer's behavior since it may be in the nature of the good being supplied that there are few alternative sources other than the supplier

Funding Mechanisms | Summary of funding mechanisms

Various funding mechanisms existing in the various agricultural value chains. Below is a summary of some selected mechanisms from our research

Instrument	Descriptions	Benefits	Limitations	Implications
Marketing company credit	• A company offers credit to identifiable strategic actors along the value chain depending on their needs and capability. This is mostly to ease cash constraints that could affect productivity. • For example, USAID supported ZATAC in Zambia to link farmers Agriflora. Agriflora in Zambia is an example of small farmers being linked to export markets through farmer associations and focused donor support.	• Quantity and price are assured • Finance is made available as and when needed • Payments are discounted as and when needed Contract terms of finance, price and product specs • Overcomes the avoidable intervention of exploitative middlemen	• Though it offers several benefits, it may not be directly accessible to small holders • Quite often credit advances increase financial outlay and administration costs • Compliance of contracts is often not respected	• Scope to control value chain through contract farming is growing in importance • Value chain approaches reduce transaction costs and risks
Lead firm Financing/Out grower	• Value chain activities can be financed using resources from within the chain and also from outside the chain. The internal financing involves flow of funds across different links of the chain using resources from one or more chain actors, e.g. supply of credit to farmers by a buyer or a lead firm to one or other actors in the chain. • The lead firm agrees to share the required knowledge and technology for production and processing with smallholder famers, and pledges to purchase the majority of their products.	• Offers secured market and price, Technical guidance for higher yields and quality • Less side-selling options due to closer monitoring • Enforceable contracts reduce side-selling • Lead firm can often hedge price risk	• Less access for small Farmers, Restricts price rise gains to producers • Cost management and enforcement of contracts	• Growing use and strong potential to provide access to markets, technical assistance and credit

Funding Mechanisms | Summary of funding mechanisms

Various funding mechanisms existing in the various agricultural value chains. Below is a summary of some selected mechanisms from our research

Instrument	Descriptions	Benefits	Limitations	Implications
Forfaiting	• Forfaiting is a means of financing that enables exporters to receive immediate cash by selling their medium and long term receivables (thus, the amount an importer owes the exporter) at a discount through an intermediary. The exporter eliminates risk by making the sale without recourse. It has no liability regarding the importer's possible default on the receivables. The forfaiter is the individual or entity that purchases the receivables. • The importer then pays the amount of the receivables to the forfaiter. A forfaiter is typically a bank or a financial firm that specializes in export financing.	• It frees up the capital for use elsewhere • It manages the collection risks and related costs Could be selectively used for specific accounts. • Forfaiting eliminates the risk that the exporter will receive payment. The practice also protects against credit risk, transfer risk, and the risks posed by foreign exchange rate or interest rate changes. Forfaiting simplifies the transaction by transforming a credit-based sale into a cash transaction. This credit-to-cash process gives immediate cash flow for the seller and eliminates collection costs. Additionally, the exporter can remove the accounts receivable, a liability, from its balance sheet.	• It makes the accounts to be sold at a discount • Since it is complex in its operations, requires the presence of specialized agencies.	• Since similar to factoring it is less common. As the invoice instruments are complex, though negotiable, their application potential is limited.
Grant and Subsidies	- Although the terms “subsidy” and “grant” are often used interchangeably, a distinction can be made between them. Grant is a type of subsidy but not the same as subsidy. Whereas subsidies are current payments (products, inputs or cash) aiming to influence levels of production or prices, grants are direct financial contributions for specific activities that support the policy objectives of the grantor.	• It allows beneficiaries to use funds for a long time as grants are not repaid • It provides no pressure on the cash flow of the business as no interest is paid on the fund. • It enables the less privileged who may not have access to external credit from banks to be able to secure funds or inputs for production	• Largely influenced by politics • Less motivation to efficient management as this is popularly known as “free money”.	• Very popular in many government funded projects • Very common in Non-governmental organization funded projects • Easy and quick to implement

Funding Mechanisms | Summary of funding mechanisms

Various funding mechanisms existing in the various agricultural value chains. Below is a summary of some selected mechanisms from our research

Instrument	Descriptions	Benefits	Limitations	Implications
• Factoring	• Agriculture factoring allows one to get an advance on unpaid receivables so he can finance payroll, buy supplies, and maintain daily operations. It is a type of short-term financing with flexible terms and eligibility requirements.	• Provides a means of capital for operations • Facilitates international business and finance by passing collection risk to a third party factor	• Complex and requires a factoring agency, which is only an option for some countries and commodities Lack of knowledge and interest of financial markets	• Though less common, it is gaining use in the agriculture sector
Warehouse receipts	A warehouse receipt is a type of documentation used in the futures markets to guarantee the quantity and quality of a particular commodity being stored within an approved facility. Warehouse receipts are important because they serve as proof that the commodity is in the warehouse and that the proper documentation has been verified.	Inventory is used as security to generate access to further finance	The bigger limitation is experienced in standardization in size, grading, and quality Increased transaction costs are related constraints Often depends on legislation and governance mechanisms for successful implementation.	There is a huge scope for expansion all across the country and cover many products and diverse growers and producers. Currently available only for durable commodities. Its use can be expanded with the introduction of suitable processing and storage technologies.

Funding Mechanisms | Summary of funding mechanisms

Various funding mechanisms existing in the various agricultural value chains. Below is a summary of some selected mechanisms from our research

Instrument	Descriptions	Benefits	Limitations	Implications
Trade credit	• It's a type of commercial financing in which the customer is allowed to purchase goods or services and pay the supplier at a later scheduled date. • Trade credit may provide access to capital for farmers that are unable to raise it through more traditional channels. Suppliers may be better than specialized financial institutions in evaluating and controlling the credit risk of their buyers. Finally, trade credit may be useful in reducing transactions costs or in providing assurances about the quality of the supplier's products. • There are mainly 3 types of trade credit. These are trade acceptance, open account and promissory note.	• Ease of transaction at the door steps of the farmer, culturally accepted and well known at all levels Secures sale or purchase and price of seller.	• Opaqueness of true market value • Due to informality, chances of side selling • Uncertainty in quality and quantity in the context of pre-harvest	• Though middlemen or traders continue to hold sway, as the value chains increasingly integrate, their importance diminishes.
Input supplier Credit	• Input supplier credit is one of the informal sources of credit available to the farmers. Farmers do not have a regular income and become seasonally short of cash. Input suppliers allow them to purchase their inputs and pay for them at a later date when they acquire cash. The repayment for input suppliers' credit is usually made after the harvest. Aside from this, input suppliers also provide technical advice.	• Buyers get the much needed inputs. Suppliers are assured of sales. • Avoid underinvesting	• Many a time input costs are excessive and exploitative, Many regions face inadequate number of suppliers in the vicinity of the buyer Repayments are not fully secured	• Quality and security are growing concerns of this model. There is a need to focus on reducing administrative costs and hassles as well as risk mitigation. Need to establish multifarious links with buyers, sellers and banks to ensure direct payments

Proposed Funding Mechanism

– our recommendation & Funding plan

Proposed Funding Mechanism| Reason for our choice

The proposed funding mechanisms are based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

Applicability / Feasibility

- Identifying and mobilising the actors would be less costly and easy because MOFA extension officers are all over the country.
- The self-managed and self capitalized nature of VSLS would make it easier to manage by the FSRP office.
- With regards to the Credit Guarantee system, GIRSAL is already in operation so using their model or drawing support from their activities would not be difficult to apply such scheme by the FSRP office.
- The success of grant and subsidy schemes by institutions such as PFJ , GASIP & NIC, is a sufficient condition for FSRP to implement the same.

Suitability / Ease of implementation

- The numerous benefits such as creation of accessibility and improvement in the financial health of participants to the project would make the implementation of the proposed mechanisms easier.
- With respect to the VSLA, the communal nature of it would make it easier to be implemented since each member owns part of the funds (VSLA scheme) and serves as guarantor to the others (guarantee scheme).
- The rates charged under these schemes are always lower than the market rate. E.g. Large commercial farmers may get some form of interest rebate. Also, with guarantees, financial institutions will likely offer financial support.
- The intervention will stimulate additional production of the selected products thereby encouraging more participation in the coming years.

Sustainability

- The with and without intervention analysis has shown how this project would be beneficial. Cascading the effort/benefit would mean sustainability, all other factors held constant.
- The complementarity of the chosen schemes suggest a remunerative provision for all actors of the value chain. This will unambiguously ensure food security in the nearest future and beyond.
- There are quite a number of assessment reports on various schemes implemented in Ghana under MOFA projects. These projects offer semblance of sustainability with few caveats. FSRP is easily able to circumvent around these reflags to make the project sustainable.

Proposed Funding Mechanism| Reason for our choice

The proposed funding mechanisms are based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

Scope of impact

- The chosen schemes offer more benefits to the actors than the other funding mechanisms. E.g. Grants/Subsidies would be a better option than an outgrower scheme where the intended beneficiaries may be shortchanged by the Lead Firm.
- The economic and financial analysis over the life of the project have demonstrated how subscribers to the project would have improved income. This will encourage more agric investment & productivity, thus ensuring food security.
- The selected schemes if well implemented would boost growth and create abundant employment opportunities, especially for the youth by transforming agriculture and industry as a whole. This will enhance production and reduce imports, e.g. rice.

Comparative challenges

- The challenges of the chosen schemes are quite manageable than the other funding schemes. This is because of the carefully selected funding mechanisms from the menu of possible schemes for all the value chain actors. E.g. The challenge with outgrower or lead firm scheme to farmers can easily be avoided in the case of VSLA. With input dealers, the challenges of subsidy is more manageable than e.g. Trade Credit.

Time for implementation

- Given that MOFA has district offices throughout the country, identifying and registering potential beneficiaries would be faster under the VSLA Scheme than if it were to be a lead-Firm or outgrower scheme. Identifying lead firms, assessing them, signing contracts with them, and the selected firms mobilising farmers under the scheme (Nucleus farmer scheme) could affect the implementation time of the project.

Proposed Funding Mechanism| Our choice

The proposed funding mechanisms are based on their viability, suitability, sustainability, risk level, expected time for implementation and level of expected impact

Products	*Value Chain Actors*		*Purpose of intervention*	*Proposed Funding Mechanism*	*Recommended Action*
MAIZE	Input dealers	Retailers Wholesalers Seed Producers Importers	1. Enhance reliable supply 2. Boost technical knowledge of products 3. Improve quality of products 4. Adequated and safe storage facilities 5. Transportation support 6. Working capital support	-Matching Grant -Partial Guarantees -Interest rate subsidy	1. FSRP to set standard or criteria for actors to be selected for funding mechanism 2. FSRP to set Teams in charge of seed subsidy, Matching Grant and Interest rate subsidy 3. Select actors for the funding based on the approved criteria 4. Based on specific need of actor, apply the funding scheme 5. Monitor and periodically perform performance review of beneficiaries
	Famers	Small / marginal farmers Large Farmers	1. Capital for production 2. Irrigation equipment 3. Extension services 4. Access to quality seed and agro-chemicals 5. Working capital support 6. Weather management issues	-Village Savings and Loans Association Funding (for small farmers) -Seed Subsidy e.g Mobile seed centres -Matching Grant -Partial Guarantees -Interest rate subsidy -Weather and yield based insurance	1. FSRP to a special team to be in charge of VSLAs 2. Team will embark on public education of the selected locations on VSLA 3. Team will help put existing VSLAs into proper structure and also form new VSLAs in line with approved guiding principles to be set by the FSRP 4. Fund should be issued to associations 5. Associations should be put into three categories (Grant Association, Interest-free Association and Low Interest Associations) 6. Periodic monitoring, review and recommendations should be made by the FSRP team to various associations 7. For the other funding mechanisms, FSRP should set Teams in charge of seed subsidy, Matching Grant, Interest rate subsidy and Credit Guarantee 8. Select actors for the funding based on the approved criteria 9. Monitor and periodically perform performance review of beneficiaries
	Aggregators		1. Transportation support 2. Warehousing support 3. Working capital support	-Matching Grant to NAFCO to increase aggregator base -Partial Guarantees -Interest rate subsidy	1. FSRP to set standard or criteria for selecting actors 2. FSRP to Select actors for the funding based on the approved criteria 3. Based on specific need of actor, apply the funding scheme 4. Monitor and periodically perform performance review of beneficiaries
	Processors / Packagers / Distributors		1. Capital expenditure support; eg. Processing and packaging plant, sorting and grading equipment 2. Adequated and safe storage facilities 3. Working capital support	-Partial Grant to capital equipment -Credit Guarantee -Interest rate subsidy for working capital	1. FSRP to set standard or criteria for selecting actors 2. FSRP to Select actors for the funding based on the approved criteria 3. Based on specific need of actor, apply the funding scheme 4. Monitor and periodically perform performance review of beneficiaries

Proposed Funding Mechanism| Our choice

We proposed a combination of funding mechanisms for specific actors in the various value chains under analysis

Products	*Value Chain Actors*		*Purpose of intervention*	*Proposed Funding Mechanism*	*Recommended Action*
RICE	Input dealers	Retailers Wholesalers Seed Producers Importers	1. Enhance reliable supply 2. Boost technical knowledge of products 3. Improve quality of products 4. Adequated and safe storage facilities 5. Transportation support 6. Working capital support	-Matching Grant -Partial Guarantees -Interest rate subsidy	1. FSRP to set standard or criteria for actors to be selected for funding mechanism 2. FSRP to set Teams in charge of seed subsidy, Matching Grant and Interest rate subsidy 3. Select actors for the funding based on the approved criteria 4. Based on specific need of actor, apply the funding scheme 5. Monitor and periodically perform performance review of beneficiaries
	Famers	Small / marginal farmers Large Farmers	1. Capital for production 2. Irrigation equipment 3. Extension services 4. Access to quality seed and agro-chemicals 5. Working capital support 6. Weather management issues	-Village Savings and Loans Association Funding (for small farmers) -Seed Subsidy e.g Mobile seed centres -Matching Grant -Partial Guarantees -Interest rate subsidy -Weather and yield based insurance	1. FSRP to a special team to be in charge of VSLAs 2. Team will embark on public education of the selected locations on VSLA 3. Team will help put existing VSLAs into proper structure and also form new VSLAs in line with approved guiding principles to be set by the FSRP 4. Fund should be issued to associations 5. Associations should be put into three categories (Grant Association, Interest-free Association and Low Interest Associations) 6. Periodic monitoring, review and recommendations should be made by the FSRP team to various associations 7. For the other funding mechanisms, FSRP should set Teams in charge of seed subsidy, Matching Grant, Interest rate subsidy and Credit Guarantee 8. Select actors for the funding based on the approved criteria
	Aggregators		1. Transportation support 2. Warehousing support 3. Working capital support	-Matching Grant to NAFCO to increase aggregator base -Partial Guarantees -Interest rate subsidy	1. FSRP to set standard or criteria for selecting actors 2. FSRP to Select actors for the funding based on the approved criteria 3. Based on specific need of actor, apply the funding scheme 4. Monitor and periodically perform performance review of beneficiaries
	Processors / Packagers / Distributors		1. Capital expenditure support; eg. Processing and packaging plant, sorting and grading equipment 2. Adequated and safe storage facilities 3. Working capital support	-Partial Grant to capital equipment -Credit Guarantee -Interest rate subsidy for working capital	1. FSRP to set standard or criteria for selecting actors 2. FSRP to Select actors for the funding based on the approved criteria 3. Based on specific need of actor, apply the funding scheme 4. Monitor and periodically perform performance review of beneficiaries

Proposed Funding Mechanism| Our choice

We proposed a combination of funding mechanisms for specific actors in the various value chains under analysis

Products	*Value Chain Actors*		*Purpose of intervention*	*Proposed Funding Mechanism*	*Recommended Action*
SOYA	Input dealers	Retailers Wholesalers Seed Producers Importers	1. Enhance reliable supply 2. Boost technical knowledge of products 3. Improve quality of products 4. Adequated and safe storage facilities 5. Transportation support 6. Working capital support	-Matching Grant -Partial Guarantees -Interest rate subsidy	1. FSRP to set standard or criteria for actors to be selected for funding mechanism 2. FSRP to set Teams in charge of seed subsidy, Matching Grant and Interest rate subsidy 3. Select actors for the funding based on the approved criteria 4. Based on specific need of actor, apply the funding scheme 5. Monitor and periodically perform performance review of beneficiaries
	Famers	Small / marginal farmers Large Farmers	1. Capital for production 2. Irrigation equipment 3. Extension services 4. Access to quality seed and agro-chemicals 5. Working capital support 6. Weather management issues	-Village Savings and Loans Association Funding (for small farmers) -Seed Subsidy e.g Mobile seed centres -Matching Grant -Partial Guarantees -Interest rate subsidy -Weather and yield based insurance	1. FSRP to a special team to be in charge of VSLAs 2. Team will embark on public education of the selected locations on VSLA 3. Team will help put existing VSLAs into proper structure and also form new VSLAs in line with approved guiding principles to be set by the FSRP 4. Fund should be issued to associations 5. Associations should be put into three categories (Grant Association, Interest-free Association and Low Interest Associations) 6. Periodic monitoring, review and recommendations should be made by the FSRP team to various associations 7. For the other funding mechanisms, FSRP should set Teams in charge of seed subsidy, Matching Grant, Interest rate subsidy and Credit Guarantee 8. Select actors for the funding based on the approved criteria
	Aggregators		1. Transportation support 2. Warehousing support 3. Working capital support	-Matching Grant to NAFCO to increase aggregator base -Partial Guarantees -Interest rate subsidy	1. FSRP to set standard or criteria for selecting actors 2. FSRP to Select actors for the funding based on the approved criteria 3. Based on specific need of actor, apply the funding scheme 4. Monitor and periodically perform performance review of beneficiaries
	Processors / Packagers / Distributors		1. Capital expenditure support; eg. Processing and packaging plant, sorting and grading equipment 2. Adequated and safe storage facilities 3. Working capital support	-Partial Grant to capital equipment -Credit Guarantee -Interest rate subsidy for working capital	1. FSRP to set standard or criteria for selecting actors 2. FSRP to Select actors for the funding based on the approved criteria 3. Based on specific need of actor, apply the funding scheme 4. Monitor and periodically perform performance review of beneficiaries

Proposed Funding Mechanism| Our choice

We proposed a combination of funding mechanisms for specific actors in the various value chains under analysis

Products	*Value Chain Actors*		*Purpose of intervention*	*Proposed Funding Mechanism*	*Recommended Action*
POULTRY	Input suppliers	Feed millers Feed distributors Farmers (maize & soya bean)	1. Enhance reliable supply of raw materials 2. Improve quality of feed 3. Adequate and safe storage facilities 4. Transportation support 5. Working capital support	-Interest Free Capital (Working / Investment Capital) -Feed subsidy -Interest rate rebate -Partial Grant	1. FSRP to set standard or criteria for actors to be selected for funding mechanism 2. FSRP to set up a team in charge of feed subsidy, Grant and Interest rate subsidy 3. Identify and register key input suppliers 4. Select actors for the funding based on the approved criteria 5. Based on specific need of actor, apply the funding scheme 6. Monitor and periodically perform performance review of beneficiaries
	Famers	Small / marginal farmers Large Farmers	1. Capital for production 2. Working capital (especially feed) 3. Vertinary services 4. Transportation support	-Interest Free Capital (Working / Investment Capital) -Feed subsidy -Interest rate rebate -Partial Grant	1. FSRP to set standard or criteria for actors to be selected for funding mechanism 2. FSRP to set up a team in charge of feed subsidy, Grant and Interest rate subsidy 3. Identify and register poultry farmers for the FSRP project 4. Select actors for the funding based on the approved criteria 5. Develop a strong relationship between farmers and input suppliers so that poultry feed will be readily available at subsidised rates. 6. Based on specific need of actor, apply the funding scheme 7. Monitor and periodically perform performance review of beneficiaries
	Aggregators		1. Transportation support 2. Warehousing support 3. Working capital support	-Interest Free Capital (Working / Investment Capital) -Interest rate rebate -Partial Grant	1. FSRP to set standard or criteria for actors to be selected for funding mechanism 2. FSRP to set up a team in charge of feed subsidy, Grant and Interest rate subsidy 3. Identify and register poultry aggregators for the FSRP project 4. Select actors for the funding based on the approved criteria 5. Develop a strong relationship between aggregators and farmers so that market for the poultry 6. Based on specific need of actor, apply the funding scheme 7. Monitor and periodically perform performance review of beneficiaries
	Processors / Packagers / Distributors		1. Capital expenditure support; eg. Processing and packaging plant, sorting and grading equipment 2. Adequated and safe storage facilities 3. Working capital support	-Partial Grant for capital equipment -Credit Guarantee -Interest rate subsidy for working capital	1. FSRP to set standard or criteria for actors to be selected for funding mechanism 2. FSRP to set up a team in charge of feed subsidy, Grant, Interest rate subsidy and Credit Guarantee 3. Identify and register poultry processors, packagers and distributers 4. Based on specific need of actor, apply the funding scheme 4. Monitor and periodically perform performance review of beneficiaries

Financial & Economic Analysis

— *impact of selected mechanism*

Financial & Economic Analysis | Measurement Criteria

According to International Fund for Agricultural Development (EFAD), Economic & Financial Analysis is only one part of the overall analysis of a project; it assumes that the project is technically sound and that its institutional arrangements will be effective during implementation.

Measurement Criteria

- Financial and economic Analyses are generally based on the comparison of the net cash flows of investment alternatives. The current situation cash flow is compared with at least one other proposed investment alternative, which according to the project's technical specialists will result in incremental financial and economic gain.
- We analyzed two scenarios under a "Do Nothing" scenario (where the actors of the value chains of the selected agriculture products continue to do business as usual), and a "Proposed" scenario (where the impact of the Funding Mechanism will be realized).
- Generally speaking, a project is considered 'viable' if the sum of expected incremental benefits is larger than the sum of all costs accrued in project implementation. This can be assessed through profitability indicators like the net present value (NPV), Internal Rate of Return (IRR) and Return on Investment (ROI).
- We adopted the NPV, IRR and B/C ratio to analyze the financial impact of the proposed funding mechanism on beneficiaries and the investment fund.
- The Net Present Value indicator is defined as the sum that results when the expected costs of the investment are deducted from the discounted value of the expected benefits (revenues). Whenever NPV is greater than zero, the project is considered worthwhile or profitable. Among mutually exclusive projects, the one with the highest NPV should be chosen.
- The Internal Rate of Return (IRR) indicator is defined as the discount rate (cost of capital or interest rate) that produces a zero NPV. This represents the maximum interest rate that a project could face and still not waste resources.

Measurement Criteria

- For the project to be profitable, the IRR has to be greater than the interest rate that could be earned in alternative investments; thus when IRR is greater than the cost of capital, the project is considered viable.
- The ROI ratio indicator is the ratio of the profit after tax to the value of total investments. The ROI ratio provides some advantages when a ranking of alternative investment projects is needed under budget constraints.
- These financial indicators were estimated for beneficiaries of various value chain actors of maize, rice, soya bean and poultry.
- Under the financial analysis, all costs and benefits were valued at market prices. Only cash inflows and outflows were considered.
- We then built the Economic analysis or cost-benefit analysis on the results of financial analysis, with the additional consideration of impacts and benefits not directly captured by the latter.
- It is worthy to note that our financial impact analysis considered only private stakeholders' (players of the value chain like farmers) interests while the economic analysis considered government and society perspectives.
- We note again the we considered different items when looking at the benefits and costs of the funding scheme under financial impact and economic impact. This is because individual actors of the value chain will exclusively consider the costs and benefits related to the market value of their business, while analysis from an economic point of view considers benefits as an increase in social well-being.
- The costs are defined as reductions in social well-being. For a project to be economically viable, its social benefits must exceed its social costs.

Financial & Economic Analysis | Financial summary

Below is a highlight of the comparative financial analysis (With vs Without Project Financial Impact on Farmers)

Maize value Chain

Average **variable cost** per 1 acre land for a planting season

GHS 4,238

and **GHS 2,000** fixed cost

Average annual Return on Investment

26.1% without the FSRP Fund

compared to

40.2% with the FSRP Fund

5 Year Net Present Value (NPV)

GHS 5,829 without the FSRP Fund

compared to

GHS 9,530 with the FSRP Fund

Poultry (Broiler) Value Chain

Average **variable cost** per 1,000 birds

GHS 65,000

and **GHS 43,200** fixed cost

Average annual Return on Investment

29.3% without the FSRP Fund

compared to

57.8% with the FSRP Fund

5 Year Net Present Value (NPV)

GHS 22,013 without the FSRP Fund

compared to

GHS 124624 with the Fund

Rice Value Chain

Average **variable cost** per 1 acre land for a planting season

GHS 5,354

and **GHS 2,150** fixed cost

Average Annual Return on Investment

56.1% without the FSRP Fund

compared to

72.9% with the FSRP Fund

5 Year Net Present Value (NPV)

GHS 15,418 without the FSRP Fund

compared to

GHS 19,880 with the FSRP Fund

Soya Bean Value Chain

Average **variable cost** per 1 acre land for a planting season

GHS 2,464

and **GHS 2,150** fixed cost

Average annual Return on Investment

49.9% without the FSRP Fund

compared to

66.8% with the FSRP Fund

5 Year Net Present Value (NPV)

GHS 6,649 without the FSRP Fund

compared to

GHS 8,997 with the FSRP Fund

Financial Analysis | Maize Value Chain

In line with International Fund for Agricultural Development (EFAD)'s principles of project evaluation, we have first examined the 'business as usual' or 'without project' alternative, and then compared it with proposed scenario (with project).

Do Nothing Scenario - Self-funded Maize farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		13,642	14,501	15,734	17,134	18,814
Total inflows						
Labour costs		(3,579)	(3,804)	(4,128)	(4,495)	(4,936)
Operating costs		(6,165)	(6,554)	(7,111)	(7,744)	(8,503)
Indirect taxes		(367)	(390)	(423)	(461)	(506)
Loan interest		-	-	-	-	-
Capital expenditure	(2,000)	-	-	-	-	-
Total Outflows	**(2,000)**	**(10,111)**	**(10,748)**	**(11,662)**	**(12,700)**	**(13,944)**
Net Cash Flow	**(2,000)**	**3,531**	**3,753**	**4,072**	**4,435**	**4,869**

Financial Rate of Return	182.3%	Average Annual ROIC	32.4%
Financial NPV	**7,694**		

Do Nothing Scenario - Loan-funded Maize farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		13,642	14,501	15,734	17,134	18,814
Total inflows						
Labour costs		(3,579)	(3,804)	(4,128)	(4,495)	(4,936)
Operating costs		(6,165)	(6,554)	(7,111)	(7,744)	(8,503)
Indirect taxes		(367)	(390)	(423)	(461)	(506)
Loan interest		(1,526)	(1,526)	(1,526)	(1,526)	(1,526)
Capital expenditure	(2,000)	-	-	-	-	-
Total Outflows	**(2,000)**	**(11,637)**	**(12,274)**	**(13,187)**	**(14,225)**	**(15,470)**
Net Cash Flow	**(2,000)**	**2,005**	**2,228**	**2,547**	**2,909**	**3,344**

Financial Rate of Return	108.2%	Average Annual ROIC	19.8%
Financial NPV	**3,964**		

Financial Analysis of Impact of proposed Funding Mechanism

- We have analyzed the financial impact of the proposed funding mechanism on maize production as illustrated in the adjacent tables.
- The analysis covers the impact of the funding mechanisms on maize farmers. Due to availability of information, we have relied on the impact of the FSRP on farmers as a representation of the impact on the maize value chain.
- Under the financial modelling, all costs and benefits were valued at market prices. We note that only cash inflows and outflows were considered (depreciation and other accounting items were not corresponding to actual flows are excluded).
- ***Do Nothing scenario (DNS)*** expresses the profitability of maize production under normal circumstances or "business as usual" situation while the ***Proposed scenario*** is represents how the proposed funding mechanism can influence production, financing and profitability. The difference between the DNS and the PS represent the incremental value or impact of the Funding mechanism.
- We noted that, there are three Do Nothing situations:

  1.Where farmers have no access to external credit and have no personal funds, therefore, do not get involved in any production.

  2. Where farmers have no access to external credit but have personal funds to involve in the production.

  3. Where farmers do not have personal funds but have access to external credit at market rate for their production. The commercial bank rate in Ghana at the first quarter of 2023 was 36.0%.

Financial Analysis | Maize Value Chain

In line with International Fund for Agricultural Development (EFAD)'s principles of project evaluation, we have first examined the 'business as usual' or 'without project' alternative, and then compared it with proposed scenario (with project).

Proposed Scenario - FSRP Soft Loan-funded Maize farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		14,324	15,226	16,521	17,991	19,754
Total inflows						
Labour costs		(3,579)	(3,804)	(4,128)	(4,495)	(4,936)
Operating costs		(5,857)	(6,226)	(6,755)	(7,356)	(8,077)
Indirect taxes		(349)	(371)	(402)	(438)	(481)
Loan interest		(763)	(763)	(763)	(763)	(763)
Capital expenditure	(2,000)	-	-	-	-	-
Total Outflows	**(2,000)**	**(10,547)**	**(11,164)**	**(12,048)**	**(13,052)**	**(14,257)**
Net Cash Flow	**(2,000)**	**3,777**	**4,063**	**4,473**	**4,939**	**5,497**

Financial Rate of Return	196.1%	Average Annual ROIC	36.9%
Financial NPV	**8,598**		

Proposed Scenario - FSRP Interest Free Loan-funded Maize farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		14,324	15,226	16,521	17,991	19,754
Total inflows						
Labour costs		(3,579)	(3,804)	(4,128)	(4,495)	(4,936)
Operating costs		(5,857)	(6,226)	(6,755)	(7,356)	(8,077)
Indirect taxes		(349)	(371)	(402)	(438)	(481)
Loan interest		-	-	-	-	-
Capital expenditure	(2,000)	-	-	-	-	-
Total Outflows	**(2,000)**	**(9,785)**	**(10,401)**	**(11,285)**	**(12,290)**	**(13,494)**
Net Cash Flow	**(2,000)**	**4,539**	**4,825**	**5,236**	**5,701**	**6,260**

Financial Rate of Return	233.2%	Average Annual ROIC	43.4%
Financial NPV	**10,463**		

Financial Analysis of Impact of proposed Funding Mechanism

- The analytical data was based on our research on farmers in Mamprugu, Kintanpo, Nkoranza, Savelugu, Kumbugu, Karaga and Builsa in the Northern part of Ghana. The data included the cost of producing 1 acre of maize which comprises hiring of a land, clearing/ploughing, cost of production, harvesting and transportation for sales.
- The maturity period for maize is 120 days (4 months) in Ghana so harvesting and selling are expected to be done in the fourth and fifth month. Our analysis assumes a 2 planting cycles in a year.
- Revenue consists of the sale of maize from two planting cycles in each of the years of analysis.
- Operating costs is made up cost of hiring and preparation of land, seed, agrochemicals, , harvesting, threshing, bagging and transportation.
- Indirect taxes are inbuilt VAT on agrochemicals and other products purchased for the production.
- Capital expenditure refers to non-current asset for the production which comprises spraying machines (one for weedicides and one for fertilizers), cutlass, hoe, boot and other equipment.
- ***The Proposed scenario*** is represents how the proposed funding mechanism can influence production, financing and profitability. We noted that, there are three Proposed Scenarios:

  1.Where farmers have access to funds at reduced/low interest rates. We assumed 50% of market commercial bank rate or input subsidies.

  2. Where farmers have access to interest-free credit. Principal will be repaid. There may be input subsidies as well.

  3. Where farmers are given grants. Principal will not be repaid.

Financial Analysis | Maize Value Chain

It is expected that increases in yield as a result of the project intervention will guarantee adequate maize production and supply in Ghana. The availability of a ready market is expected to encourage more farmers to produce more maize as a cash crop, leading to increased returns, improved livelihoods and earning of disposable income of actors of the maize value chain

Proposed Scenario assumptions

- Under the proposed scenario, we also assumed a 5% increase in production, 5% reduction in operating costs due to the subsidies and inputs or the timely availability of credits.
- In estimating the net present value, because the analysis is over a 5 year duration, we adopted the most recent bank of Ghana's 5 year bond yield as the risk free rate and adjusted it as the cost of capital for the analysis. This was sourced from the Bank's website.
- From our field research, the total production cost of one planting cycle of 1 acre land of maize was GHS 4,238 (operating/variable cost) and GHS 2,354 (Fixed cost).

Financial Impact of FSRP funding mechanism

Self-funded farmer vs FSRP funded

- If the farmer has no access to external fund and does not have personal fund, the Do Nothing situation is zero. All the financial impact of the proposed scenario becomes the value of the proposed mechanism. The incremental 5-year net present value (NPV) of a maize farm will be GHS 10,643 per acre, under the interest free FSRP fund and GHS 8,598, under a low interest FSRP fund.
- If the farmer has no access to external credit but has some personal funds to invest in the maize production, the 5-year NPV is estimated to GHS 7,694 with average annual Return On Investment (ROI) of 32.4% per acre of land. Using the FSRP interest free credit (with NPV of GHS 10,463 per acre of land) and FSRP low interest credit (with NPV of GHS 8,598 per acre of land), the incremental NPV of the project over the Do Nothing Situation is between GHS 904 and GHS 2,949 (depending on the level of interest subsidy).

Credit funded farmer vs FSRP funded

- Even if the farmer has access to external credit at market rate, the 5-year NPV of the maize farm is estimated at GHS 3,964 due to the high interest on loan (36%). In comparison to the FSRP interest free credit (with NPV of GHS 10,463 per acre of land) and FSRP low interest credit (with NPV of GHS 8,598 per acre of land), the incremental NPV of the project over the Do Nothing Situation is between GHS 4,634 and GHS 6,499 (depending on the level of interest subsidy).
- The FSRP funding scheme's financial benefit is therefore expected to exceed the financial result of not establishing the scheme.

Economic Analysis | Maize Value Chain

The Proposed Funding Mechanisms are expected to bring a lot of relief to farmers in the affected districts, where maize plantation continues to be on subsistent basis instead of planting for commercial purposes due to lack of capital and inputs. Given the importance of the commodity in the Ghana, all actors of the value chain will benefit tremendously

Do Nothing Scenario - Loan-funded Maize farmer

GHS		Years					
	CF	0	1	2	3	4	5
Operating revenue	1.05		14,324	15,226	16,521	17,991	19,754
Total inflows							
Labour costs	0.95		(3,400)	(3,614)	(3,921)	(4,270)	(4,689)
Operating costs	0.95		(5,857)	(6,226)	(6,755)	(7,356)	(8,077)
Indirect taxes	0.00		-	-	-	-	-
Loan interest	n/a		-	-	-	-	-
Initial investments	n/a	(2,000)	-	-	-	-	-
Total Outflows		**(2,000)**	**(9,257)**	**(9,840)**	**(10,677)**	**(11,627)**	**(12,766)**
Net Cash Flow		**(2,000)**	**5,067**	**5,386**	**5,844**	**6,364**	**6,988**
Economic rate of Return		259.7%					
Economic NPV		**11,911**					

Proposed Scenario - FSRP Soft Loan-funded Maize farmer

GHS		Years					
	CF	0	1	2	3	4	5
Operating revenue	1.05		15,040	15,988	17,347	18,891	20,742
Total inflows							
Labour costs	0.95		(3,400)	(3,614)	(3,921)	(4,270)	(4,689)
Operating costs	0.95		(5,564)	(5,915)	(6,418)	(6,989)	(7,674)
Indirect taxes	0.00		-	-	-	-	-
Loan interest	n/a		-	-	-	-	-
Initial investments	n/a	(2,000)	-	-	-	-	-
Total Outflows		**(2,000)**	**(8,964)**	**(9,529)**	**(10,339)**	**(11,259)**	**(12,363)**
Net Cash Flow	n/a	**(2,000)**	**6,076**	**6,459**	**7,008**	**7,631**	**8,379**
Economic rate of Return		310.3%					
Economic NPV		**14,682**					

Economic Analysis & Impact of proposed Funding Mechanism

- The entire maize value chain is generally worth the FSRP investment as the increase in economic activity as a result of the project will lead to much more positive externalities and lead to an improved standard of living for all actors.
- The incremental economic value is estimated at GHS 2,771 per acre of land, representing a 23.26% over the Do Nothing situation. We adopted the financial interest rate of the funds as our established social rate of discount that realistically reflects an investment alternative (opportunity cost) for the government.
- The Conversion Factors (CF) refer to the multipliers used to convert from market values to values to economic values. Generally, positive externalities increase conversion factors. The CF (Consultant assumed 5% in in revenue and 5% decrease in cost) are based on the following reasons:
    - CF applied to revenue represents the ability of farmers to sell at better prices through the funding Scheme to reflect the real value of the products.
    - CF applied to wages reflects the presence of high unemployment in these areas, which would push people to work for lower than market wages.
    - CF applied to investments and operating costs reflects the presence of high transport costs and geographical differential prices of farm inputs that make the product's market price overestimate its social value.
    - We deducted the indirect taxes (21.75% VAT&NHIL) from all inputs that qualify for indirect taxes and the interest on the loan to reflect the economic value of the inputs.

Financial Analysis | Rice Value Chain

In line with International Fund for Agricultural Development (EFAD)'s principles of project evaluation, we have first examined the 'business as usual' or 'without project' alternative, and then compared it with proposed scenario (with project).

Do Nothing Scenario - Self-funded Rice farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		17,793	18,914	20,521	22,348	24,538
Total inflows						
Labour costs		(4,409)	(4,687)	(5,085)	(5,538)	(6,080)
Operating costs		(5,693)	(6,052)	(6,566)	(7,151)	(7,852)
Indirect taxes		(433)	(461)	(500)	(544)	(598)
Loan interest		-	-	-	-	-
Capital expenditure	(2,150)	-	-	-	-	-
Total Outflows	**(2,150)**	**(10,536)**	**(11,199)**	**(12,151)**	**(13,233)**	**(14,530)**
Net Cash Flow	**(2,150)**	**7,257**	**7,714**	**8,370**	**9,115**	**10,008**

Financial Rate of Return	344.1%	Average Annual ROIC	63.7%
Financial NPV	**17,774**		

Do Nothing Scenario - Loan-funded Rice farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		17,793	18,914	20,521	22,348	24,538
Total inflows						
Labour costs		(4,409)	(4,687)	(5,085)	(5,538)	(6,080)
Operating costs		(5,693)	(6,052)	(6,566)	(7,151)	(7,852)
Indirect taxes		(433)	(461)	(500)	(544)	(598)
Loan interest		(1,927)	(1,927)	(1,927)	(1,927)	(1,927)
Capital expenditure	(2,150)	-	-	-	-	-
Total Outflows	**(2,150)**	**(12,463)**	**(13,127)**	**(14,079)**	**(15,160)**	**(16,457)**
Net Cash Flow	**(2,150)**	**5,330**	**5,787**	**6,443**	**7,188**	**8,081**

Financial Rate of Return	256.6%	Average Annual ROIC	48.5%
Financial NPV	**13,062**		

Financial Analysis of Impact of proposed Funding Mechanism

- We have analyzed the financial impact of the proposed funding mechanism on rice production as illustrated in the adjacent tables.
- The analysis covers the impact of the funding mechanisms on rice farmers. Due to availability of information, we have relied on the impact of the FSRP on farmers as a representation of the impact on the rice value chain.
- Under the financial modelling, all costs and benefits were valued at market prices. We note that only cash inflows and outflows were considered (depreciation and other accounting items were not corresponding to actual flows are excluded).
- ***Do Nothing scenario (DNS)*** expresses the profitability of maize production under normal circumstances or "business as usual" situation while the ***Proposed scenario (PS)*** is represents how the proposed funding mechanism can influence production, financing and profitability. The difference between the DNS and the PS represent the incremental value or impact of the Funding mechanism.
- We noted that, there are three Do Nothing situations:

  1.Where farmers have no access to external credit and have no personal funds, therefore, do not get involved in any production.

  2. Where farmers have no access to external credit but have personal funds to involve in the production.

  3. Where farmers do not have personal funds but have access to external credit at market rate for their production. The commercial bank rate in Ghana at the first quarter of 2023 was 36.0%.

Financial Analysis | Rice Value Chain

In line with International Fund for Agricultural Development (EFAD)'s principles of project evaluation, we have first examined the 'business as usual' or 'without project' alternative, and then compared it with proposed scenario (with project).

Proposed Scenario - FSRP Soft Loan-funded Rice farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		18,682	19,859	21,547	23,465	25,765
Total inflows						
Labour costs		(4,409)	(4,687)	(5,085)	(5,538)	(6,080)
Operating costs		(5,409)	(5,749)	(6,238)	(6,793)	(7,459)
Indirect taxes		(412)	(438)	(475)	(517)	(568)
Loan interest		(964)	(964)	(964)	(964)	(964)
Capital expenditure	(2,150)	-	-	-	-	-
Total Outflows	**(2,150)**	**(11,193)**	**(11,837)**	**(12,762)**	**(13,812)**	**(15,071)**
Net Cash Flow	**(2,150)**	**7,489**	**8,022**	**8,786**	**9,653**	**10,694**

Financial Rate of Return	355.8%	Average Annual ROIC	69.0%
Financial NPV	**18,702**		

Proposed Scenario - FSRP Interest Free Loan-funded Rice farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		18,682	19,859	21,547	23,465	25,765
Total inflows						
Labour costs		(4,409)	(4,687)	(5,085)	(5,538)	(6,080)
Operating costs		(5,409)	(5,749)	(6,238)	(6,793)	(7,459)
Indirect taxes		(412)	(438)	(475)	(517)	(568)
Loan interest		-	-	-	-	-
Capital expenditure	(2,150)	-	-	-	-	-
Total Outflows	**(2,150)**	**(10,229)**	**(10,874)**	**(11,798)**	**(12,848)**	**(14,107)**
Net Cash Flow	**(2,150)**	**8,453**	**8,986**	**9,749**	**10,617**	**11,657**

Financial Rate of Return	399.8%	Average Annual ROIC	76.9%
Financial NPV	**21,058**		

Financial Analysis of Impact of proposed Funding Mechanism

- The analytical data was based on our research on farmers in Nkoranza, Savelugu, Karaga, Builsa South, Talon, and KIS Asutuary. The data included the cost of producing 1 acre of rice which comprises hiring of a land, clearing/ploughing, cost of production, harvesting and transportation for sales.
- The maturity period for rice is between 4 to 5 months in Ghana so harvesting and selling are expected to be done in the fifth and sixth month. Our analysis assumes a 2 planting cycles in a year.
- Revenue consists of the sale of rice from two planting cycles in each of the years of analysis.
- Operating costs is made up cost of hiring and preparation of land, seed, agrochemicals, , harvesting, threshing, bagging and transportation.
- Indirect taxes are inbuilt VAT on agrochemicals and other products purchased for the production.
- Capital expenditure refers to non-current asset for the production which comprises spraying machines (one for weedicides and one for fertilizers), cutlass, hoe, boot and other equipment.
- ***The Proposed scenario*** is represents how the proposed funding mechanism can influence production, financing and profitability. We noted that, there are three Proposed Scenarios:

  1.Where farmers have access to funds at reduced/low interest rates. We assumed 50% of market commercial bank rate or input subsidies.

  2. Where farmers have access to interest-free credit. Principal will be repaid. There may be input subsidies as well.

  3. Where farmers are given grants. Principal will not be repaid.

Financial Analysis | Rice Value Chain

It is expected that increases in yield as a result of the project intervention will guarantee adequate rice production and supply in Ghana. The availability of a ready market is expected to encourage more farmers to produce more rice as a cash crop, leading to increased returns, improved livelihoods and earning of disposable income of actors of the rice value chain

Proposed Scenario assumptions

- Under the proposed scenario, we also assumed a 5% increase in production, 5% reduction in operating costs due to the subsidies and inputs or the timely availability of credits.
- In estimating the net present value, because the analysis is over a 5 year duration, we adopted the most recent bank of Ghana's 5 year bond yield as the risk free rate and adjusted it as the cost of capital for the analysis. This was sourced from the Bank's website.
- From our field research, the total production cost of one planting cycle of 1 acre land of rice was GHS 5,354 (operating/variable cost) and GHS 2,150 (Fixed cost).

Financial Impact of FSRP funding mechanism

Self-funded farmer vs FSRP funded

- If a farmer has no access to external fund and does not have personal fund, the Do Nothing situation is zero. All the financial impact of the proposed scenario becomes the value of the proposed mechanism. The incremental 5-year net present value (NPV) of a rice farm will be GHS 21,058 per acre, under the interest free FSRP fund and GHS 18,702, under a low interest FSRP fund.
- If a farmer has no access to external credit but has some personal funds to invest in the rice production, the 5-year NPV is estimated to GHS 17,774 with average annual Return On Investment (ROI) of 63.7% per acre of land. Using the FSRP interest free credit (with NPV of GHS 21,058 per acre of land) and FSRP low interest credit (with NPV of GHS 18,702 per acre of land), the incremental NPV of the project over the Do Nothing Situation is between GHS 928 and GHS 2,356 (depending on the level of FSRP interest subsidy).

Credit funded farmer vs FSRP funded

- Even if a farmer has access to external credit at market rate, the 5-year NPV of the rice farm is estimated at GHS 13,062 due to the high interest on loan (36%). In comparison to the FSRP interest free credit (with NPV of GHS 21,058 per acre of land) and FSRP low interest credit (with NPV of GHS 18,702 per acre of land), the incremental NPV of the project over the Do Nothing Situation is between GHS 5,640 and GHS 7,996 (depending on the level of interest subsidy).
- The FSRP funding scheme's financial benefit is therefore expected to exceed the financial result of not establishing the scheme.

Economic Analysis | Rice Value Chain

The Proposed Funding Mechanisms are expected to bring a lot of relief to farmers in the affected districts, where rice plantation continues to be on subsistent basis instead of planting for commercial purposes due to lack of capital and inputs. Given the importance of the commodity in the Ghana, all actors of the value chain will benefit tremendously

Do Nothing Scenario - Loan-funded Rice farmer

GHS		Years					
	CF	0	1	2	3	4	5
Operating revenue	1.05		18,682	19,859	21,547	23,465	25,765
Total inflows							
Labour costs	0.95		(4,189)	(4,452)	(4,831)	(5,261)	(5,776)
Operating costs	0.95		(5,409)	(5,749)	(6,238)	(6,793)	(7,459)
Indirect taxes	0.00		-	-	-	-	-
Loan interest	n/a		-	-	-	-	-
Initial investments	n/a	(2,150)	0	0	0	0	-
Total Outflows		**(2,150)**	**(9,597)**	**(10,202)**	**(11,069)**	**(12,054)**	**(13,235)**
Net Cash Flow		**(2,150)**	**9,085**	**9,658**	**10,478**	**11,411**	**12,529**

Economic rate of Return	429.2%
Economic NPV	**22,794**

Proposed Scenario - FSRP Soft Loan-funded Rice farmer

GHS		Years					
	CF	0	1	2	3	4	5
Operating revenue	1.05		19,616	20,852	22,625	24,638	27,053
Total inflows							
Labour costs	0.95		(4,189)	(4,452)	(4,831)	(5,261)	(5,776)
Operating costs	0.95		(5,138)	(5,462)	(5,926)	(6,454)	(7,086)
Indirect taxes	0.00		-	-	-	-	-
Loan interest	n/a		-	-	-	-	-
Initial investments	n/a	(2,150)	0	0	0	0	-
Total Outflows		**(2,150)**	**(9,327)**	**(9,914)**	**(10,757)**	**(11,714)**	**(12,862)**
Net Cash Flow	n/a	**(2,150)**	**10,290**	**10,938**	**11,868**	**12,924**	**14,190**

Economic rate of Return	485.2%
Economic NPV	**26,101**

Economic Analysis & Impact of proposed Funding Mechanism

- The entire rice value chain is generally worth the FSRP investment as the increase in economic activity as a result of the project will lead to much more positive externalities and lead to an improved standard of living for all actors.
- The incremental economic value is estimated at GHS 3,307 per acre of land over the Do Nothing situation. We adopted the financial interest rate of the funds as our established social rate of discount that realistically reflects an investment alternative (opportunity cost) for the government.
- The Conversion Factors (CF) refer to the multipliers used to convert from market values to values to economic values. Generally, positive externalities increase conversion factors. The CF (Consultant assumed 5% in in revenue and 5% decrease in cost) are based on the following reasons:
    - CF applied to revenue represents the ability of farmers to sell at better prices through the funding Scheme to reflect the real value of the products.
    - CF applied to wages reflects the presence of high unemployment in these areas, which would push people to work for lower than market wages.
    - CF applied to investments and operating costs reflects the presence of high transport costs and geographical differential prices of farm inputs that make the product's market price overestimate its social value.
    - We deducted the indirect taxes (21.75% VAT&NHIL) from all inputs that qualify for indirect taxes and the interest on the loan to reflect the economic value of the inputs.

Financial Analysis | Soya bean Value Chain

In line with International Fund for Agricultural Development (EFAD)'s principles of project evaluation, we have first examined the 'business as usual' or 'without project' alternative, and then compared it with proposed scenario (with project).

Do Nothing Scenario - Self-funded Soya bean farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		9,105	9,679	10,501	11,436	12,557
Total inflows						
Labour costs		(1,455)	(1,547)	(1,679)	(1,828)	(2,007)
Operating costs		(3,763)	(4,000)	(4,340)	(4,727)	(5,190)
Indirect taxes		(286)	(305)	(330)	(360)	(395)
Loan interest		-	-	-	-	-
Capital expenditure	(2,150)	-	-	-	-	-
Total Outflows	**(2,150)**	**(5,505)**	**(5,852)**	**(6,349)**	**(6,914)**	**(7,592)**
Net Cash Flow	**(2,150)**	**3,600**	**3,827**	**4,152**	**4,521**	**4,965**

Financial Rate of Return	173.0%	Average Annual ROIC	56.4%
Financial NPV	**7,733**		

Do Nothing Scenario - Loan-funded Soya bean farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		9,105	9,679	10,501	11,436	12,557
Total inflows						
Labour costs		(1,455)	(1,547)	(1,679)	(1,828)	(2,007)
Operating costs		(3,763)	(4,000)	(4,340)	(4,727)	(5,190)
Indirect taxes		(286)	(305)	(330)	(360)	(395)
Loan interest		(887)	(887)	(887)	(887)	(887)
Capital expenditure	(2,150)	-	-	-	-	-
Total Outflows	**(2,150)**	**(6,392)**	**(6,739)**	**(7,236)**	**(7,801)**	**(8,479)**
Net Cash Flow	**(2,150)**	**2,713**	**2,940**	**3,265**	**3,634**	**4,078**

Financial Rate of Return	132.8%	Average Annual ROIC	43.4%
Financial NPV	**5,565**		

Financial Analysis of Impact of proposed Funding Mechanism

- We have analyzed the financial impact of the proposed funding mechanism on soya bean production as illustrated in the adjacent tables.
- The analysis covers the impact of the funding mechanisms on rice farmers. Due to availability of information, we have relied on the impact of the FSRP on farmers as a representation of the impact on the rice value chain.
- Under the financial modelling, all costs and benefits were valued at market prices. We note that only cash inflows and outflows were considered (depreciation and other accounting items were not corresponding to actual flows are excluded).
- ***Do Nothing scenario (DNS)*** expresses the profitability of maize production under normal circumstances or "business as usual" situation while the ***Proposed scenario (PS)*** is represents how the proposed funding mechanism can influence production, financing and profitability. The difference between the DNS and the PS represent the incremental value or impact of the Funding mechanism.
- We noted that, there are three Do Nothing situations:

  1.Where farmers have no access to external credit and have no personal funds, therefore, do not get involved in any production.

  2. Where farmers have no access to external credit but have personal funds to involve in the production.

  3. Where farmers do not have personal funds but have access to external credit at market rate for their production. The commercial bank rate in Ghana at the first quarter of 2023 was 36.0%.

Financial Analysis | Soya bean Value Chain

In line with International Fund for Agricultural Development (EFAD)'s principles of project evaluation, we have first examined the 'business as usual' or 'without project' alternative, and then compared it with proposed scenario (with project).

Proposed Scenario - FSRP Soft Loan-funded Soya bean farmer

GHS	Years					
	0	*1*	*2*	*3*	*4*	*5*
Operating revenue		9,560	10,163	11,026	12,008	13,184
Total inflows						
Labour costs		(1,455)	(1,547)	(1,679)	(1,828)	(2,007)
Operating costs		(3,575)	(3,800)	(4,123)	(4,490)	(4,930)
Indirect taxes		(272)	(289)	(314)	(342)	(375)
Loan interest		(443)	(443)	(443)	(443)	(443)
Capital expenditure	(2,150)	-	-	-	-	-
Total Outflows	**(2,150)**	**(5,746)**	**(6,080)**	**(6,559)**	**(7,104)**	**(7,756)**
Net Cash Flow	**(2,150)**	**3,814**	**4,082**	**4,467**	**4,904**	**5,428**

Financial Rate of Return	183.9%	Average Annual ROIC	63.4%
Financial NPV	**8,455**		

Proposed Scenario - FSRP Interest Free Loan-funded Soya bean farmer

GHS	Years					
	0	*1*	*2*	*3*	*4*	*5*
Operating revenue		9,560	10,163	11,026	12,008	13,184
Total inflows						
Labour costs		(1,455)	(1,547)	(1,679)	(1,828)	(2,007)
Operating costs		(3,575)	(3,800)	(4,123)	(4,490)	(4,930)
Indirect taxes		(272)	(289)	(314)	(342)	(375)
Loan interest		-	-	-	-	-
Capital expenditure	(2,150)	-	-	-	-	-
Total Outflows	**(2,150)**	**(5,303)**	**(5,637)**	**(6,116)**	**(6,660)**	**(7,313)**
Net Cash Flow	**(2,150)**	**4,258**	**4,526**	**4,910**	**5,348**	**5,872**

Financial Rate of Return	204.0%	Average Annual ROIC	70.2%
Financial NPV	**9,539**		

Financial Analysis of Impact of proposed Funding Mechanism

- The analytical data was based on our research on farmers in Nkoranza, Savelugu, Karaga, Builsa South, Talon, and KIS Asutuary. The data included the cost of producing 1 acre of soya bean which comprises hiring of a land, clearing/ploughing, agrochemical cost, cost of production, harvesting and transportation for sales.
- The maturity period for soya bean is between 4 to 5 months in Ghana so harvesting and selling are expected to be done in the fifth and sixth month. Our analysis assumes a 2 planting cycles in a year.
- Revenue consists of the sale of soya bean from two planting cycles in each of the years of analysis.
- Operating costs is made up cost of hiring and preparation of land, seed, agrochemicals, , harvesting, threshing, bagging and transportation.
- Indirect taxes are inbuilt VAT on agrochemicals and other products purchased for the production.
- Capital expenditure refers to non-current asset for the production which comprises spraying machines (one for weedicides and one for fertilizers), cutlass, hoe, boot and other equipment.
- ***The Proposed scenario*** is represents how the proposed funding mechanism can influence production, financing and profitability. We noted that, there are three Proposed Scenarios:

  1.Where farmers have access to funds at reduced/low interest rates. We assumed 50% of market commercial bank rate or input subsidies.

  2. Where farmers have access to interest-free credit. Principal will be repaid. There may be input subsidies as well.

  3. Where farmers are given grants. Principal will not be repaid.

Financial Analysis | Soya bean Value Chain

It is expected that increases in yield as a result of the project intervention will guarantee adequate soya bean production and supply in Ghana. The availability of a ready market is expected to encourage more farmers to produce more soya bean as a cash crop, leading to increased returns, improved livelihoods and earning of disposable income of actors of the soya bean value chain

Proposed Scenario assumptions

- Under the proposed scenario, we also assumed a 5% increase in production, 5% reduction in operating costs due to the subsidies and inputs or the timely availability of credits.
- In estimating the net present value, because the analysis is over a 5 year duration, we adopted the most recent bank of Ghana's 5 year bond yield as the risk free rate and adjusted it as the cost of capital for the analysis. This was sourced from the Bank's website.
- From our field research, the total production cost of one planting cycle of 1 acre land of soya bean was GHS 2,464 (operating/variable cost) and GHS 2,150 (Fixed cost).

Financial Impact of FSRP funding mechanism

Self-funded farmer vs FSRP funded

- If a farmer has no access to external fund and does not have personal fund, the Do Nothing situation is zero. All the financial impact of the proposed scenario becomes the value of the proposed mechanism. The incremental 5-year net present value (NPV) of a soya bean farm will be GHS 9,539 per acre, under the interest free FSRP fund and GHS 8,455, under a low interest FSRP fund.
- If a farmer has no access to external credit but has some personal funds to invest in the soya bean production, the 5-year NPV is estimated to GHS 7,733 with an average annual Return On Investment (ROI) of 56.4% per acre of land. Using the FSRP interest free credit (with NPV of GHS 9,539 per acre of land) and FSRP low interest credit (with NPV of GHS 8,455 per acre of land), the incremental NPV of the project over the Do Nothing Situation is between GHS 722 and GHS 1,806 (depending on the level of FSRP interest subsidy).

Credit funded farmer vs FSRP funded

- Even if a farmer has access to external credit at market rate, the 5-year NPV of the soya bean farm is estimated at GHS 5,565 due to the high interest on loan (36%). In comparison to the FSRP interest free credit (with NPV of GHS 9,539 per acre of land) and FSRP low interest credit (with NPV of GHS 8,455 per acre of land), the incremental NPV of the project over the Do Nothing Situation is between GHS 2,890 and GHS 3,974 (depending on the level of interest subsidy).
- The FSRP funding scheme's financial benefit is therefore expected to exceed the financial result of not establishing the scheme.

Economic Analysis | Soya bean Value Chain

The Proposed Funding Mechanisms are expected to bring a lot of relief to farmers in the affected districts, where soya bean plantation continues to be on subsistent basis instead of planting for commercial purposes due to lack of capital and inputs. Given the importance of the commodity in the Ghana, all actors of the value chain will benefit tremendously

Do Nothing Scenario - Loan-funded Soya bean farmer

GHS		Years					
	CF	0	1	2	3	4	5
Operating revenue	1.05		9,560	10,163	11,026	12,008	13,184
Total inflows							
Labour costs	0.95		(1,383)	(1,470)	(1,595)	(1,737)	(1,907)
Operating costs	0.95		(3,575)	(3,800)	(4,123)	(4,490)	(4,930)
Indirect taxes	0.00		-	-	-	-	-
Loan interest	n/a		-	-	-	-	-
Initial investments	n/a	(2,150)	-	-	-	-	-
Total Outflows		**(2,150)**	**(4,958)**	**(5,270)**	**(5,718)**	**(6,227)**	**(6,837)**
Net Cash Flow		**(2,150)**	**4,602**	**4,892**	**5,308**	**5,781**	**6,347**

Economic rate of Return	220.2%
Economic NPV	**10,486**

Proposed Scenario - FSRP Soft Loan-funded Soya bean farmer

GHS		Years					
	CF	0	1	2	3	4	5
Operating revenue	1.05		10,038	10,671	11,578	12,608	13,844
Total inflows							
Labour costs	0.95		(1,383)	(1,470)	(1,595)	(1,737)	(1,907)
Operating costs	0.95		(3,396)	(3,610)	(3,917)	(4,266)	(4,684)
Indirect taxes	0.00		-	-	-	-	-
Loan interest	n/a		-	-	-	-	-
Initial investments	n/a	(2,150)	-	-	-	-	-
Total Outflows		**(2,150)**	**(4,779)**	**(5,080)**	**(5,512)**	**(6,002)**	**(6,591)**
Net Cash Flow	n/a	**(2,150)**	**5,259**	**5,591**	**6,066**	**6,606**	**7,253**

Economic rate of Return	250.9%
Economic NPV	**12,289**

Economic Analysis & Impact of proposed Funding Mechanism

- The entire soya bean value chain is generally worth the FSRP investment as the increase in economic activity as a result of the project will lead to much more positive externalities and lead to an improved standard of living for all actors.
- The incremental economic value is estimated at GHS 1,803 per acre of land over the Do Nothing situation. We adopted the financial interest rate of the funds as our established social rate of discount that realistically reflects an investment alternative (opportunity cost) for the government.
- The Conversion Factors (CF) refer to the multipliers used to convert from market values to values to economic values. Generally, positive externalities increase conversion factors. The CF (Consultant assumed 5% in in revenue and 5% decrease in cost) are based on the following reasons:
    - CF applied to revenue represents the ability of farmers to sell at better prices through the funding Scheme to reflect the real value of the products.
    - CF applied to wages reflects the presence of high unemployment in these areas, which would push people to work for lower than market wages.
    - CF applied to investments and operating costs reflects the presence of high transport costs and geographical differential prices of farm inputs that make the product's market price overestimate its social value.
    - We deducted the indirect taxes (21.75% VAT&NHIL) from all inputs that qualify for indirect taxes and the interest on the loan to reflect the economic value of the inputs.

Financial Analysis | Poultry (Broiler) Value Chain

In line with International Fund for Agricultural Development (EFAD)'s principles of project evaluation, we have first examined the 'business as usual' or 'without project' alternative, and then compared it with proposed scenario (with project).

Do Nothing Scenario - Self-funded Poultry (Broiler) farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		248,025	263,650	286,061	311,520	342,049
Total inflows						
Labour costs		(35,790)	(38,045)	(41,279)	(44,952)	(49,358)
Operating costs		(105,511)	(112,159)	(121,692)	(132,523)	(145,510)
Indirect taxes		(22,118)	(23,511)	(25,510)	(27,780)	(30,503)
Loan interest		-	-	-	-	-
Capital expenditure	(70,920)	(50,726)	(55,038)	(59,936)	(32,905)	-
Total Outflows	**(70,920)**	**(214,146)**	**(228,753)**	**(248,417)**	**(238,160)**	**(225,370)**
Net Cash Flow	**(70,920)**	**33,879**	**34,897**	**37,644**	**73,360**	**116,679**

Financial Rate of Return	56.1%	Average Annual ROIC	35.2%
Financial NPV	**50,619**		

Do Nothing Scenario - Loan-funded Poultry (Broiler) farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		248,025	263,650	286,061	311,520	342,049
Total inflows						
Labour costs		(35,790)	(38,045)	(41,279)	(44,952)	(49,358)
Operating costs		(105,511)	(112,159)	(121,692)	(132,523)	(145,510)
Indirect taxes		(22,118)	(23,511)	(25,510)	(27,780)	(30,503)
Loan interest		(23,400)	(23,400)	(23,400)	(23,400)	(23,400)
Capital expenditure	(70,920)	(50,726)	(55,038)	(59,936)	(32,905)	-
Total Outflows	**(70,920)**	**(237,546)**	**(252,153)**	**(271,817)**	**(261,560)**	**(248,770)**
Net Cash Flow	**(70,920)**	**10,479**	**11,497**	**14,244**	**49,960**	**93,279**

Financial Rate of Return	26.4%	Average Annual ROIC	23.4%
Financial NPV	**- 6,592**		

Financial Analysis of Impact of proposed Funding Mechanism

- We have analyzed the financial impact of the proposed funding mechanism on broiler poultry production as illustrated in the adjacent tables.
- The analysis covers the impact of the funding mechanisms on broiler poultry farmers. Due to availability of information, we have relied on the impact of the FSRP on farmers as a representation of the impact on the rice value chain.
- Under the financial modelling, all costs and benefits were valued at market prices. We note that only cash inflows and outflows were considered (depreciation and other accounting items were not corresponding to actual flows are excluded).
- ***Do Nothing scenario (DNS)*** expresses the profitability of maize production under normal circumstances or "business as usual" situation while the ***Proposed scenario (PS)*** is represents how the proposed funding mechanism can influence production, financing and profitability. The difference between the DNS and the PS represent the incremental value or impact of the Funding mechanism.
- We noted that, there are three Do Nothing situations:

  1.Where farmers have no access to external credit and have no personal funds, therefore, do not get involved in any production.

  2. Where farmers have no access to external credit but have personal funds to involve in the production.

  3. Where farmers do not have personal funds but have access to external credit at market rate for their production. The commercial bank rate in Ghana at the first quarter of 2023 was 36.0%.

Financial Analysis | Poultry (Broiler) Value Chain

In line with International Fund for Agricultural Development (EFAD)'s principles of project evaluation, we have first examined the 'business as usual' or 'without project' alternative, and then compared it with proposed scenario (with project).

Proposed Scenario - FSRP Soft Loan-funded Poultry (Broiler) farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		260,426	276,833	300,364	327,096	359,151
Total inflows						
Labour costs		(35,790)	(38,045)	(41,279)	(44,952)	(49,358)
Operating costs		(100,236)	(106,551)	(115,607)	(125,896)	(138,234)
Indirect taxes		(7,630)	(8,111)	(8,801)	(9,584)	(10,523)
Loan interest		(11,700)	(11,700)	(11,700)	(11,700)	(11,700)
Capital expenditure	(70,920)	(50,726)	(55,038)	(59,936)	(32,905)	-
Total Outflows	**(70,920)**	**(206,083)**	**(219,445)**	**(237,323)**	**(225,038)**	**(209,815)**
Net Cash Flow	**(70,920)**	**54,343**	**57,388**	**63,040**	**102,058**	**149,336**

Financial Rate of Return	85.9%	Average Annual ROIC	54.5%
Financial NPV	**110,322**		

Proposed Scenario - FSRP Interest Free Loan-funded Poultry (Broiler) farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		260,426	276,833	300,364	327,096	359,151
Total inflows						
Labour costs		(35,790)	(38,045)	(41,279)	(44,952)	(49,358)
Operating costs		(100,236)	(106,551)	(115,607)	(125,896)	(138,234)
Indirect taxes		(7,630)	(8,111)	(8,801)	(9,584)	(10,523)
Loan interest		-	-	-	-	-
Capital expenditure	(70,920)	(50,726)	(55,038)	(59,936)	(32,905)	-
Total Outflows	**(70,920)**	**(194,383)**	**(207,745)**	**(225,623)**	**(213,338)**	**(198,115)**
Net Cash Flow	**(70,920)**	**66,043**	**69,088**	**74,740**	**113,758**	**161,036**

Financial Rate of Return	101.2%	Average Annual ROIC	61.1%
Financial NPV	**138,927**		

Financial Analysis of Impact of proposed Funding Mechanism

- The analytical data was based on our research on farmers in Kumasi, Kintampo, Nkoranza, Savelugu, Karaga, Builsa South, Talon, and KIS Asutuary. The data included the cost of producing 1000 poultry.
- The maturity period for broiler poultry is between 4 to 5 months in Ghana so harvesting and selling are expected to be done in the fifth and sixth month. Our analysis assumes a 2 poultry cycles in a year.
- Revenue consists of the sale of broiler poultry from two planting cycles in each of the years of analysis.
- Operating costs is made up cost of feed, vaccines, electricity, water, wood shavings for litter.
- Indirect taxes are inbuilt VAT on agrochemicals and other products purchased for the production.
- Capital expenditure refers to non-current asset for the production which comprises poultry structures, drinkers and feeders, heaters.
- ***The Proposed scenario*** is represents how the proposed funding mechanism can influence production, financing and profitability. We noted that, there are three Proposed Scenarios:

  1.Where farmers have access to funds at reduced/low interest rates. We assumed 50% of market commercial bank rate or input subsidies.

  2. Where farmers have access to interest-free credit. Principal will be repaid. There may be input subsidies as well.

  3. Where farmers are given grants. Principal will not be repaid.

Financial Analysis | Poultry (Broiler) Value Chain

It is expected that increases in yield as a result of the project intervention will guarantee adequate soya bean production and supply in Ghana. The availability of a ready market is expected to encourage more farmers to produce more broiler poultry bean as a cash crop, leading to increased returns, improved livelihoods and earning of disposable income of actors of the broiler poultry value chain

Proposed Scenario assumptions

- Under the proposed scenario, we also assumed a 5% increase in production, 5% reduction in operating costs due to the subsidies and inputs or the timely availability of credits.
- In estimating the net present value, because the analysis is over a 5 year duration, we adopted the most recent bank of Ghana's 5 year bond yield as the risk free rate and adjusted it as the cost of capital for the analysis. This was sourced from the Bank's website.
- From our field research, the total production cost of one planting cycle of 1 acre land of soya bean was GHS 65,000 (operating/variable cost) and GHS 43,200 (Fixed cost).

Financial Impact of FSRP funding mechanism

Self-funded farmer vs FSRP funded

- If a farmer has no access to external fund and does not have personal fund, the Do Nothing situation is zero. All the financial impact of the proposed scenario becomes the value of the proposed mechanism. The incremental 5-year net present value (NPV) of a broiler poultry farm will be GHS 138,927 per 1000 birds, under the interest free FSRP fund and GHS 110,322, under a low interest FSRP fund.
- If a farmer has no access to external credit but has some personal funds to invest in the soya bean production, the 5-year NPV is estimated to GHS 50,619 with an average annual Return On Investment (ROI) of 35.2% per 1000 broiler poultry. Using the FSRP interest free credit (with NPV of GHS 138,927 per 1000 birds) and FSRP low interest credit (with NPV of GHS 110,322 per 1000 poultry birds), the incremental NPV of the project over the Do Nothing Situation is between GHS 59,702 and GHS 88,308 (depending on the level of FSRP interest subsidy).

Credit funded farmer vs FSRP funded

- Even if a farmer has access to external credit at market rate, the 5-year NPV of the broiler poultry farm is estimated at (6,592) due to the high interest on loan (36%). We noted from the field that, no body wants to go into broilers today because of cheaper sources overseers. In comparison to the FSRP interest free credit (with NPV of GHS 138,927 per 1000 poultry birds) and FSRP low interest credit (with NPV of GHS 110,322 per 1000 poultry birds), the incremental NPV of the project over the Do Nothing Situation is between GHS 116,914 and GHS 145,519 (depending on the level of interest subsidy).
- The FSRP funding scheme's financial benefit is therefore expected to exceed the financial result of not establishing the scheme.

Economic Analysis | Poultry (Broiler) Value Chain

The Proposed Funding Mechanisms are expected to bring a lot of relief to farmers in the affected districts, where broiler poultry plantation continues to be on subsistent basis instead of planting for commercial purposes due to lack of capital and inputs. Given the importance of the commodity in the Ghana, all actors of the value chain will benefit tremendously

Do Nothing Scenario - Loan-funded Poultry (Broiler) farmer

GHS		Years					
	CF	0	1	2	3	4	5
Operating revenue	1.05		260,426	276,833	300,364	327,096	359,151
Total inflows							
Labour costs	0.95		(34,001)	(36,143)	(39,215)	(42,705)	(46,890)
Operating costs	0.95		(100,236)	(106,551)	(115,607)	(125,896)	(138,234)
Indirect taxes	0.00		-	-	-	-	-
Loan interest	n/a		-	-	-	-	-
Initial investments	n/a	(70,920)	(50,726)	(55,038)	(59,936)	(32,905)	-
Total Outflows		**(70,920)**	**(184,963)**	**(197,731)**	**(214,759)**	**(201,506)**	**(185,124)**
Net Cash Flow		**(70,920)**	**75,463**	**79,102**	**85,605**	**125,590**	**174,027**
Economic rate of Return		114.3%					
Economic NPV		**164,790**					

Proposed Scenario - FSRP Soft Loan-funded Poultry (Broiler) farmer

GHS		Years					
	CF	0	1	2	3	4	5
Operating revenue	1.05		273,447	290,674	315,382	343,451	377,109
Total inflows							
Labour costs	0.95		(34,001)	(36,143)	(39,215)	(42,705)	(46,890)
Operating costs	0.95		(95,224)	(101,223)	(109,827)	(119,602)	(131,323)
Indirect taxes	0.00		-	-	-	-	-
Loan interest	n/a		-	-	-	-	-
Initial investments	n/a	(70,920)	(50,726)	(55,038)	(59,936)	(32,905)	-
Total Outflows		**(70,920)**	**(179,951)**	**(192,404)**	**(208,978)**	**(195,212)**	**(178,212)**
Net Cash Flow	n/a	**(70,920)**	**93,496**	**98,271**	**106,404**	**148,239**	**198,896**
Economic rate of Return		139.5%					
Economic NPV		**214,300**					

Economic Analysis & Impact of proposed Funding Mechanism

- The entire soya bean value chain is generally worth the FSRP investment as the increase in economic activity as a result of the project will lead to much more positive externalities and lead to an improved standard of living for all actors.
- The incremental economic value is estimated at GHS 49,510 per 1000 poultry birds over the Do Nothing situation. We adopted the financial interest rate of the funds as our established social rate of discount that realistically reflects an investment alternative (opportunity cost) for the government.
- The Conversion Factors (CF) refer to the multipliers used to convert from market values to values to economic values. Generally, positive externalities increase conversion factors. The CF (Consultant assumed 5% in in revenue and 5% decrease in cost) are based on the following reasons:
  - CF applied to revenue represents the ability of farmers to sell at better prices through the funding Scheme to reflect the real value of the products.
  - CF applied to wages reflects the presence of high unemployment in these areas, which would push people to work for lower than market wages.
  - CF applied to investments and operating costs reflects the presence of high transport costs and geographical differential prices of farm inputs that make the product's market price overestimate its social value.
  - We deducted the indirect taxes (21.75% VAT&NHIL) from all inputs that qualify for indirect taxes and the interest on the loan to reflect the economic value of the inputs.

Risks & Mitigations Plan

– *of proposed funding mechanism*

Proposed Funding Mechanism| Our choice

Our proposed Option is not without risks but we have proposed a mitigation strategy to manage the risks

Products	*Funding Mechanism*	*Risks*	*Mitigation actions*	*Gender / Deprived support*
MAIZE	Grant	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by beneficiaries as recovery rate is zero (free money) -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the payment of grants and subsequent grants should be based on performance appraisal of initial grants -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more grants with additional guidance to help women and deprived actors to achieve optimum impact of the FSRP.
	Subsidy (Seed and Interest rate)	-Allocation of seed subsidy to wrong actors who may not use the subsidy for its intended purpose -Mismanagement of funds by beneficiaries as recovery rate is zero (free money) -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the issuance of subsidy. Additional subsidy should be based on performance appraisal of initial subsidies -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more subsidies experienced farmers, existing farmers, women and deprived actors to achieve optimum impact of the FSRP.
	Village Savings and Loans Associations	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by associations -Risk of default by members -Political intereference	-Careful appraisal and diligence in the formation of the associations -Adequate education on the operations on VSLAs -Set guiding principles for beneficiaries to follow -Strict periodic post funding monitoring of actors -Stagger the payment of funds and subsequent grants should be based on performance appraisal of initial funds -Disconnect the FSRP from similar projects of the government	The VSLA will be categorised under three Tiers. 1. Tier 1 - Low interest fund 2. Tier 2 - No interest fund 3. Tier 3 - Grant fund The Consultant recommends that the Tier 3 associations should be dominated by women, start-ups, deprived communities, actors with
	Credit Guarantee	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Risk of default by beneficiaries -Political interference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Amount of guarantee should be based on standard factors like the historical performance, existing businesses, etc -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends that FSRP should provide only partial credit guarantee to reduce the impact of default.

Proposed Funding Mechanism| Our choice

Our proposed Option is not without risks but we have proposed a mitigation strategy to manage the risks

Products	*Funding Mechanism*	*Risks*	*Mitigation actions*	*Gender / Deprived support*
RICE	Grant	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by beneficiaries as recovery rate is zero (free money) -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the payment of grants and subsequent grants should be based on performance appraisal of initial grants -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more grants with additional guidance to help women and deprived actors to achieve optimum impact of the FSRP.
	Subsidy (Seed and Interest rate)	-Allocation of seed subsidy to wrong actors who may not use the subsidy for its intended purpose -Mismanagement of funds by beneficiaries as recovery rate is zero (free money) -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the issuance of subsidy. Additional subsidy should be based on performance appraisal of initial subsidies -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more subsidies experienced farmers, existing farmers, women and deprived actors to achieve optimum impact of the FSRP.
	Village Savings and Loans Associations	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by associations -Risk of default by members -Political intereference	-Careful appraisal and diligence in the formation of the associations -Adequate education on the operations on VSLAs -Set guiding principles for beneficiaries to follow -Strict periodic post funding monitoring of actors -Stagger the payment of funds and subsequent grants should be based on performance appraisal of initial funds -Disconnect the FSRP from similar projects of the government	The VSLA will be categorised under three Tiers. 1. Tier 1 - Low interest fund 2. Tier 2 - No interest fund 3. Tier 3 - Grant fund The Consultant recommends that the Tier 3 associations should be dominated by women, start-ups, deprived communities, actors with
	Credit Guarantee	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Risk of default by beneficiaries -Political interference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Amount of guarantee should be based on standard factors like the historical performance, existing businesses, etc -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends that FSRP should provide only partial credit guarantee to reduce the impact of default.

Proposed Funding Mechanism| Our choice

Our proposed Option is not without risks but we have proposed a mitigation strategy to manage the risks

Products	*Funding Mechanism*	*Risks*	*Mitigation actions*	*Gender / Deprived Support*
SOYA	Grant	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by beneficiaries as recovery rate is zero (free money) -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the payment of grants and subsequent grants should be based on performance appraisal of initial grants -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more grants with additional guidance to help women and deprived actors to achieve optimum impact of the FSRP.
	Subsidy (Seed and Interest rate)	-Allocation of seed subsidy to wrong actors who may not use the subsidy for its intended purpose -Mismanagement of funds by beneficiaries as recovery rate is zero (free money) -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the issuance of subsidy. Additional subsidy should be based on performance appraisal of initial subsidies -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more subsidies experienced farmers, existing farmers, women and deprived actors to achieve optimum impact of the FSRP.
	Village Savings and Loans Associations	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by associations -Risk of default by members -Political intereference	-Careful appraisal and diligence in the formation of the associations -Adequate education on the operations on VSLAs -Set guiding principles for beneficiaries to follow -Strict periodic post funding monitoring of actors -Stagger the payment of funds and subsequent grants should be based on performance appraisal of initial funds -Disconnect the FSRP from similar projects of the government	The VSLA will be categorised under three Tiers. 1. Tier 1 - Low interest fund 2. Tier 2 - No interest fund 3. Tier 3 - Grant fund The Consultant recommends that the Tier 3 associations should be dominated by women, start-ups, deprived communities, actors with
	Credit Guarantee	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Risk of default by beneficiaries -Political interference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Amount of guarantee should be based on standard factors like the historical performance, existing businesses, etc -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends that FSRP should provide only partial credit guarantee to reduce the impact of default.

Proposed Funding Mechanism| Our choice

Our proposed Option is not without risks but we have proposed a mitigation strategy to manage the risks

Products	*Funding Mechanism*	*Risks*	*Mitigation actions*	*Gender / Deprived Support*
POULTRY	Grant	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by beneficiaries as recovery rate is zero (free money) -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the payment of grants and subsequent grants should be based on performance appraisal of initial grants -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more grants with additional guidance to help women and deprived actors to achieve optimum impact of the FSRP.
	Subsidy (Seed and Interest rate)	-Allocation of seed subsidy to wrong actors who may not use the subsidy for its intended purpose -Mismanagement of funds by beneficiaries -Political intereference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Stagger the issuance of subsidy. Additional subsidy should be based on performance appraisal of initial subsidies -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends more subsidies experienced farmers, existing farmers, women and deprived actors to achieve optimum impact of the FSRP.
	Village Savings and Loans Associations	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Mismanagement of funds by associations -Risk of default by members -Political intereference	-Careful appraisal and diligence in the formation of the associations -Adequate education on the operations on VSLAs -Set guiding principles for beneficiaries to follow -Strict periodic post funding monitoring of actors -Stagger the payment of funds and subsequent grants should be based on performance appraisal of initial funds -Disconnect the FSRP from similar projects of the government	The VSLA will be categorised under three Tiers. 1. Tier 1 - Low interest fund 2. Tier 2 - No interest fund 3. Tier 3 - Grant fund The Consultant recommends that the Tier 3 associations should be dominated by women, start-ups, deprived communities, actors with
	Credit Guarantee	-Use of funds for other purposes instead of the stipulalted purpose of the FSRP -Risk of default by beneficiaries -Political interference	-Careful appraisal and diligence in selection of actors -Set guiding principles for beneficiaries to follow -Amount of guarantee should be based on standard factors like the historical performance, existing businesses, etc -Strict periodic post funding monitoring of actors -Disjoint the FSRP from similar projects of the government	-The Consultant recommends that FSRP should provide only partial credit guarantee to reduce the impact of default.

Literature Review

— *Lessons from other jurisdictions*

Literature Review | Global value chain analysis

Globally, two of the most common means of financing soybeans for traders are receivables finance and secured financing.

Overview of the Global Value Chain of the selected products

- The global value chain (GVC) framework is useful to identify opportunities for, and bottlenecks to, upgrading and development of capabilities in global industries. It provides a methodology for tracing patterns of value creation as well as understanding power and governance across the full range of economic activities within an industry. It does so by exploring the linkages amongst geographically dispersed economic activities and actors (Gereffi and Fernandez-Stark, 2011).
- Specific patterns of governance can become a hindrance for the building up of innovation capabilities (Lema, et al., 2018). The ability of local producers within the GVC to engage in different forms of upgrading can be constrained by the ways in which local firms are inserted into the GVC and the power asymmetries between them, lead firms and other actors.

Global Soya bean value chain

- The total world production for soybeans in 2020 was 353,463,735 metric tonnes, up 5.1% from 336,329,392 tonnes in 2019. Brazil was the largest producer, accounting for 34% of world production, followed by the United States at 32%.
- The global soybean supply chain is a prime example. According to the Observatory of Economic Complexity, in 2016 soybeans were the 50th most-traded of 1,238 products globally, yielding US$51.7 billion of exports, with US and Brazil having the largest shares (US$22.8 billion and US$19.4 billion, respectively). In the global soybean supply chain, pre-production is related to inputs from supplying industries (e.g., seed, agrochemicals, and machinery companies) and financial institutions. The post-production stage is composed of warehousing (e.g., cooperatives and traders), processing industries (e.g., grain transformation, animal feed, and vegetal oil production), logistics (distribution to internal and external markets) and consumption (Roberti et al., 2014).

Global Soya bean value chain

- Sitting between these pre-production and post-production stages, producers are often vulnerable due to high economic indebtedness (Pujari, 2011; Gerber, 2014) as they try to keep up with technological innovations in inputs and management and experience reduced bargaining power over both inputs and outputs in a globalized market. This situation can lead producers to become tied to an “agricultural treadmill,” a set of structural conditions shaped by international political and economic processes that produce a negative feedback cycle of investment and debt driven by the need to incorporate technology and scientific advances into production processes (Ward, 1993).
- Soybean production in Brazil has expanded since the 1970s and occupies an area of approximately 35 million hectares, comprising a third of the total area of global soybean cultivation (CONAB, 2018). Recent expansion during the twenty-first century has been driven by the global appetite for meat (soybeans is used as an animal feed source) and the increased purchasing power of consumers in emerging economies such as China (Pinazza, 2007; Silva et al., 2017).
- Economic and institutional players (e.g., traders, public research agencies) have also influenced expansion of the crop in Brazil, not only by stimulating the increase of soybean planted area but also investing in farm credit, subsidies, logistics and market chains (Steward, 2007; Wesz, 2016). As a result, Brazil has increased the number of soybean producers engaging in this global market, as observed by the exports to China and other countries since 2000s (Silva et al., 2017). Concomitantly, there has been consolidation of private companies developing and marketing seeds, agrochemicals (e.g., fertilizers, pesticides) and dominant in the commodities market (Oliveira, 2016; Wesz, 2016; Westengen et al., 2019).
- Globally, two of the most common means of financing soybeans for traders are receivables finance and secured financing.

Literature Review | Global value chain analysis

The main sources of formal rural credit for smallholder farmers are the credit unions, microfinance/savings and loans, and rural banks. In general, agricultural credit from financial institutions (FI) is severely limited for maize smallholder farmers

Global Maize value chain

- The world's total maize production was estimated at 1.05 million thousand tonnes in 2020. The United States of America is the top country in terms of maize production in the world. As of 2020, maize production in the United States of America was 360,252 thousand tonnes that accounts for 34.28% of the world's maize production. The top 5 countries (others are China, Brazil, Argentina, and Ukraine) account for 74.86% of it.
- The nature of the demand for maize is also changing. Maize is an important food crop but over the past decade, its demand as livestock feed has grown tremendously. This has largely been driven by rapid economic growth in highly populated regions in Asia, the Middle East and Latin America leading to increased demand for poultry and livestock products from more affluent consumers. Maize is also a key ingredient in animal feed and is used extensively in industrial products, including the production of biofuels. Increasing demand and production shortfalls in global maize supplies have worsened market volatility and contributed to surging global maize prices.
- With increasing diversification of maize demand and utilization, global trade has become an important strategy for overcoming production shortfalls. Maize is the second most widely traded cereal after wheat. Annual exports, estimated at about 90 million metric tons, mainly from North America (USA), Eastern Europe (mainly Ukraine) and South America (mainly Argentina and Brazil) meet the growing demand for maize imports in Mexico, North Africa, East Asia, and West Asia and South East Asia among the developing countries and Japan and Canada among the high income economies.

Global Maize value chain

- Mistrust, information gaps and weak control measures impede maize credit cooperation. Achieving cooperation in the maize value chain for credit access is a complex process. This is because value chains represent interactive processes between diverse actors, of different perspectives, interests, and positions which lead to intended and unintended outcomes (Van Woerkum et al., 2011). As such, successful value chain cooperation has been argued to require evidence of clear beneficial outcomes to multiple actors (Perez et al., 2010) and a bond of trust between actors (Miller and Jones, 2010).
- The main sources of formal rural credit for smallholder farmers are the credit unions, microfinance/savings and loans, and rural banks. In general, agricultural credit from financial institutions (FI) is severely limited for maize smallholder farmers.
- Due to smallholder farmer lending defaults. Generally, FIs prefer to provide farmer group credit through a respected trader, project, or farmer organization to share part of the risks and monitoring. FI loan officers are only able to visit farms once or twice per season. Before loans are provided, farmers have their farms and homes visited, and debt status checked with other financial institutions. When operating in groups, farmers usually serve to monitor and pressure each other to repay loans under joint liability terms.

Literature Review | Global value chain analysis

The main sources of formal rural credit for smallholder farmers are the credit unions, microfinance/savings and loans, and rural banks. In general, agricultural credit from financial institutions (FI) is severely limited for maize smallholder farmers

Global Rice value chain

- Rice is one of the most valuable cereal crops cultivated and consumed all over the world. China is the world leading country for rice paddy production. As of 2021, rice, paddy production in China was 214 million tonnes that accounts for 27.18% of the world's rice, paddy production. The top 5 countries (others are India, Bangladesh, Indonesia, and Viet Nam) account for 71.63% of it. The world's total rice, paddy production was estimated at 788 million tonnes in 2021.
- Most rice farmers in irrigation schemes do not have sufficient financial resources of their own to exploit their holdings fully. Without a functioning system of seasonal credit, those who have access to rain-fed farmland tend to divert their labor resources towards these crops and to reduce the area of irrigated rice they cultivate. An alternative response is to reduce the level of inputs and so the costs of rice farming, by applying lower rates of fertilisers and using their own seeds.
- The lack of an effective and accessible system of seasonal credit for poorer farmers, allowing them to manage risk, limits their potential to make use of the irrigated land. As the land was developed at great cost to governments, this impacts negatively on the overall return on investment. It also leads to increasing differentiation between producers, as those who can finance their farming operations take advantage of those who cannot, by taking over their holdings through unofficial rental arrangements. Government policy cannot ignore the issue of access to seasonal credit and to inputs.

Global Rice value chain

- To ensure that farmers are not left behind in the shift to regenerative food systems, a mix of funding sources and instruments is required, the most catalytic being long-term patient capital and de-risking using concessionary finance and technical assistance. Together, these efforts is to transform rice production – which currently emits more greenhouse gases than the aviation industry – into a sustainable agrifood system.
- The main sources of formal rural credit for smallholder farmers are the credit unions, microfinance/savings and loans, and rural banks. In general, agricultural credit from financial institutions (FI) is severely limited for maize smallholder farmers.
- Accordingly, two new finance tools developed are a blended finance facility designed with funds from the Global Environment Facility (GEF) and is piloted in Bangladesh, Cambodia and Vietnam. The facility aims to catalyze public and private funds for climate-resilient rice farms, value chains and livelihoods. The approach is to design the facility's integrated financing mechanism, develop local and national stakeholder capacities and establish impact monitoring of the facility.

Literature Review | Global value chain analysis

It has been established that smallholder poultry farmers within the within Africa, in particular accessed credit facilities for their poultry business mainly from informal sources such as relatives, friends, traders, moneylenders, among others.

Global Poultry value chain

- China is the top country in terms of poultry meat domestic supply in the world. As of 2020, poultry meat domestic supply in China was 22,718 thousand tonnes that accounts for 17.74% of the world's poultry meat domestic supply. The top 5 countries (others are the United States of America, Brazil, Mexico, and Russian Federation) account for 48.16% of it. The world's total poultry meat domestic supply was estimated at 128,085 thousand tonnes in 2020.
- Poultry production is part of a long integrated value chain that includes backwards linkages to agriculture (production of maize and soya), the processing of these into feed (required for energy and protein needs), the growing of chickens, and the slaughtering, packaging, distribution and retailing of the final product. This means that the industry has significant employment and income multipliers into the rest of the economy.
- Growing the poultry value chain requires development of a number of different capabilities. This includes capabilities in agricultural production – growing sufficient maize and soya competitively – as well as capabilities related to production of poultry – productive breeds for broiler production; technically efficient broiler production at scale; large scale investment in production facilities; and technical and organizational capabilities required in commercial poultry production. Furthermore, there are competencies required in services too (logistics).
- Good agricultural (Poultry) business practices is capital intensive. It has been determined that the agricultural enterprises that make Good Agricultural Practices (GAP) have increased their market share and economic efficiency (Söyler and Atli, 2018). Although Özpınar and Çay (2018) emphasized the contribution of farm mechanization in farming system, including poultry production system, a mechanized poultry farming is capital intensive and thus requires credit financing.

Global Poultry value chain

- In the light of this, different governments in the world offer different types of loans, guarantees and other supporting measures to facilitate these small scale agribusinesses access to capital. Evidence from empirical studies show that debt financing of poultry agribusinesses is associated with short duration to guarantee pay-off (Abereijo and Fayomi, 2005). Furthermore, banks in many developing countries prefer to lend to other sectors to the detriment of poultry firms expected return and risk (Levitsky, 1996).
- It has been established that smallholder poultry farmers within the within Africa, in particular accessed credit facilities for their poultry business mainly from informal sources such as relatives, friends, traders, moneylenders, and Rotating Savings and Credit Association (ROSCA) among others. Also, small-scale poultry farmer's access to credit facilities is largely affected by farmer's individual factors such as educational level, size of household, size of farm, membership of farm based organization and saving. Challenges included high interest rate on loans, high administrative and insurance costs on credit facilities from financial institutions, lack of collateral securities to secure loans, low educational background and lack of management skills were the main bottlenecks that impeded smallholder poultry farming household's access to credit facilities.

Literature Review | Global value chain analysis

We have presented a review of selected country specific case studies on agriculture value chain financing

Morocco

- Agricultural activities are a key contributor to Morocco's economy. In 2020, agriculture, forestry, and fishing sector accounted for 12% of the GDP, the second-highest value added in North Africa after Algeria. Morocco has around 30 million hectares of agricultural land area. About 21 million hectares are under permanent meadows and pastures, while seven million hectares are arable land. Access to financing and investment resources is perhaps the most important constraint facing family farmers. Credit to agriculture in Morocco is about 7.4% of agricultural GDP, while overall credit to the economy is 65% of total GDP. This shows that agriculture's share of financing is extremely low compared to agriculture's contribution to the economy. Agriculture's share of credit (adjusted for its contribution to GDP) is nearly nine times less than the average for the whole economy. Existing financial institutions, credit instruments and bank procedures are ill-adapted to the needs of family farmers. Farmers are not able to provide the kind of guarantees that banks require to lend, since many family farmers do not have notarized land titles. The amounts of credit required by individual family farmers are usually small and are not of interest to banks. Moreover, many banks consider agriculture to be too risky and prefer not to lend to it.
- Morocco to address the financing issues decisively introduced subsidies, State financial aid and grants for the benefit of farmers and investors in agriculture. It names the Agricultural Development Fund (FDA) as the institution responsible for the implementation of this financial assistance. The Moroccan authorities took a most audacious action to ameliorate the financing difficulties faced by farmers and investors in agriculture where PMV proposes direct financing of farms. With this arrangement, farmers could obtain inputs financing, advances on crops and other types of loans tailored to their financing needs.

Morocco

- Agricultural financing policies in Morocco are focused on the smallholder farmers. The obvious reason, based on the findings of Mateos-Ronco and Guzman Asuncion (2018) – discussed under fallout in food insecurity – is that the smallholder famers are the hardest hit by dearth of finance for agricultural production. In Morocco, the 'most vulnerable farmers' and 'rural population' make the beneficiaries of agricultural finance.
- The Green Morocco Plan (PMV) highlights two main strategic issues in financing agricultural production in Morocco. Of utmost concern to the authorities and lenders is the high risk of agricultural production. This issue should ideally be treated as a given since it tends to be a universal problem of agricultural financing all over the world. However, emphasizing it in the policy document reflects concern about possible food insecurity disaster it portends for the country. It would seem that PMV is a decisive policy response fashioned to cushion the blow of risk aversion tendencies in agricultural financing. Financing for agriculture in Morocco is yet fraught with the challenge of fragmentation of land structures. The PMV situates this strategic issue in difficulty which aggregated farmers have in benefiting from modern techniques of agricultural financing. Due to this the risk challenge of agricultural insurance is serious and evident in the empirical review of risk and risk-taking orientations of the farmers and insurers.

Literature Review | Global value chain analysis

We have presented a review of selected country specific case studies on agriculture value chain financing

Brazil

- In Agricultural Financing, although there is a multitude of programs, the biggest programs are PRONAF and PRONAMP, which aim to support small family farms and medium-sized producers, respectively. Funds are primarily channeled via public banks to earmarked beneficiaries at capped interest rates. The government programs are the main source of rural credit and about half of the farmers that have a loan, have obtained this loan through government programs. However, in recent years the number of farmers obtaining credit through public programs has declined, Credit is very concentrated in a small number of large farms and products, while the vast majority of small farms receives only a small share of total credit. The market-based instruments, such as agricultural letters of credit, are gaining importance, especially for large farms.
- Brazil's policies for the poultry value chain have included subsidized credit for farmers as well as poultry producers. The National Rural Credit System (SNCR) was established in 1965 with the purpose of providing rural credit at low interest rates to help producers finance agricultural outputs and machinery, as well as operating costs and product marketing. Three key objectives of the rural credit policy created in 1965 remain in effect today (Lopez and Lowery, 2015): i) access to credit at below-market interest rates; ii) the legal requirement that banks devote a portion of their checking deposits to rural credit lines; and iii) small and family farmers benefit from even lower interest rates by targeted credit lines.
- Evidence in the literature has shown that government-driven lending through public banks (half of rural credit lending volume in the country) is concentrated in a small number of large and more established farms. Amongst private banks, earmarked loans are smaller than free-market loans, are focused on clients with a longer credit relationship, and finance loans with better credit ratings.

Brazil

- The principal financial agent for PRONAF is the Bank of Brazil (Banco do Brazil), which has an extensive network of branches throughout the country and a long tradition of working with rural credit. When PRONAF was launched, its nominal interest rate ranged from 16 to 12%, but interest rates have gradually been lowered, and in 2015, costing and investment lines started at a rate of 2.5% to 5.5% per annum. Interest rates are much more attractive than commercial rates and have been a strong stimulus for family farming. The poultry sector is well-supported as far as accessing export markets are concerned. Poultry producers' relationship with government has been built through the industry association, and this is the forum through which engagement with government occurs. Poultry producers receive assistance in the form of tax exemptions (the drawback policy), and programs that provide cash advances for export sales. The drawbacks policy has been important for stimulating exports. It consists of the suspension or elimination of taxes levied on inputs used in exported products, thus acting as an incentive for exports by reducing the cost of producing exportable products (and making these products more competitive in the international market) (UBABEF, 2012)
- The majority of rural credit is for short term working capital financing, with limited longer term investment financing, which is critical to support agriculture expansion, and particularly sustainable agriculture. Long term financing is low, due to several reasons, including inter-alia, the historic macroeconomic volatility, banks' lack of long-term funding, and farms' difficulty to comply with environmental regulations. Long- term financing is particularly relevant to support the capital investment needed for the adoption of sustainable agriculture production technologies.

Literature Review | Global value chain analysis

We have presented a review of selected country specific case studies on agriculture value chain financing

South Africa

- Broiler production by contract growers in South Africa has increased over the years and is currently at approximately 60-80% of total broiler production (Bosiu et al., 2017). The entry of contract growers has been partly facilitated by the sale of the poultry farms by the major poultry producers to new contract farmers, for example, Daybreak Farms sold off seven of its farms to black poultry producers. The shift towards a greater reliance on contract growing has largely been as a result of an increasing desire by the major poultry producers to shift costs associated with owning large pieces of farm land from themselves to the contract growers.
- Contract growing creates opportunities for entry given the low cost of capital required to start up in comparison with other stages of the value chain which require a significantly higher level of expertise. The increasing prevalence of contract growers is also important in the context of inclusive growth. However, despite the opportunities created by contract farming, to become effective competitors entrants still need to enter at multiple levels of the value chain for vertical coordination and to leverage inputs. The entry of Grain Fields Chicken (GFC) illustrates this. This may not be the case if access to breeding stock and competitive feed was available at fair terms (discussed below).

Taiwan

- Taiwan's agriculture is characterized by small scale and intensiveness, as well as its very best traditional agricultural cultivation technological basis in the world. Improvements and developments in agricultural industries, and the promotion of agriculture biotechnology for entrepreneurial operations and industrial management in agribusiness, are major strategic objectives of the Council of Agriculture in Taiwan. Taiwanese government has been committed to the counseling and promotion of the agricultural biotechnological industry. In fact, Taiwan's agricultural technological development has great advantages and a solid foundation for the development of biotechnology industries using agricultural materials.
- With solid background in agriculture, Taiwan has the potential for agricultural R and D capabilities and technologies, as well as governmental commitment to the promotion of agricultural technology upgrades and transitions. With the active development of local niche commodities to enhance competitiveness, Taiwan's agribusiness continuously produces breakthroughs in product R and D and technological developments for great achievements in the biotechnological industry, and thus, timely access to financing has become a key factor of success.
- According to the statistics of Taiwan Institute of Economic Research, the funding of Taiwan agricultural biotechnological companies mainly comes from individual investors, which accounts for 63.10%, followed by domestic companies (23.80%) and governmental funding (1.90%), while foreign investment and venture capital sources are less.
- Taiwan's agribusiness has a traditional operational mode of small scale, and most agricultural biotechnological companies are located sparsely, and thus, are relatively lacking the characteristics of industrial clusters.

Literature Review | Global value chain analysis

We have presented a review of selected country specific case studies on agriculture value chain financing

Vietnam

- Reforms in the agricultural sector transformed Vietnam from a country experiencing extreme food insecurity into being one of the world's largest exporter of agricultural commodities including rice, coffee, rubber, tea, vegetables, fruits, coconuts, sugar cane, cashew nuts, soybeans, groundnuts, cassava and pepper. Consequently, agriculture now plays a relatively important role in the economy of Vietnam.
- The structure of credit in Vietnam is characterized by the presence of a formal and informal sector. The formal sector is dominated by five State-owned commercial banks with a lending share of 73.5 percent. Among them are the Vietnam Bank for Agriculture and Rural Development (VBARD), the People Credit Funds and Rural Shareholding Banks (RSB), Bank for Investment and Development (BID), Bank for Foreign Trade (Vietcombank) and the Bank for Commerce and Industry (BCI). VBARD is the largest bank in Vietnam, with access to most of the communes in Vietnam and also provides wholesale lending to the PCF, RSB and the Vietnam Bank for Social Policy (VBSP). State-owned commercial banks also provide financial services to State-owned enterprises and rural households.
- At the farmer/producer level, trade credit is usually provided by input suppliers to smallholder rice farmers while production loans are provided by banks. In the formal sector, credit practices in Vietnam are mostly collateral-based lending for loans higher than a certain amount (VND 10 million).
- For exporters in Vietnam, the typical mode of transaction with a foreign buyer is to sign a contract leading to a letter of credit on the basis of which, funds are disbursed by a credit institution to the marketing agent responsible for the procurement.

Vietnam

- There are other channels of credit delivery carried out by other players in the rice chain. Specific to each actor in the rice value chain, the following financial practices and relationships were established: i) farmers availed themselves of loans from informal sources such as input suppliers, moneylenders, friends and relatives as well as from banks; ii) assemblers, wholesalers and millers obtained credit from agricultural banks/state commercial banks as well as from informal sources such as friends, relatives, money lenders, and traders; and iii) retailers borrowed from friends/relatives and from rice wholesalers. The State-owned enterprises rely mostly on State-owned agricultural banks and/or State commercial banks for financing.
- The government of Vietnam has promoted the sale of agricultural produce through contracts between SOEs and farming households. Vietnam has five main types of contract farming arrangements. namely: i) sales contract with State processing enterprises; ii) production contract with foreign companies: iii) sale to private merchants by oral engagement; iv) sale through cooperatives and; v) handicraft and industrial village network.
- Contract farming in Vietnam covers almost all major agricultural products from plantation crops, forestry, livestock and fishery. The Government has played a major role in promoting contract farming in Vietnam by implementing specific policies and legislative measures on land use, investment, credit, technical advances and technology transfer and market and trade promotion. In addition to these, specific support services and incentives were provided to promote contract farming; credit and financial services were facilitated by VBARD while public infrastructure and technology transfers were also provided by Government agencies. Contract farming provides a link between State-owned enterprises and farmers through its cooperatives or farmer organizations.

Appendices

— *Supporting documents*

Appendices | Institutions visited by Consultant

Institution	Contact Person	Phone number	Email address
GISRAL	Mr. Takyi Sraha (Chief Operation Officer)	+233244232771 +233550000331	Takyi.sraha@girsal.com
Ghana Commodity Exchange	Mr. Richard Nii Okanta Ankrah	+2333022690670 +233594164479	richard@gcx.com.gh
National Food Buffer Stock Company (NAFCO)	Mr. Kofi Amankwah (Deputy Chief Executive Officer)	+233302785259 +233547339024	Kofi.amankwah@nafco.gov.gh
ADB	Mr. Lawrence Danky-Ansong (Head – Agric Value Chain)	+233248007200	ldankyi-ansong@agricbank.com
ABSA	Mr. Williams	+233207498606	n/a
PFJ Secretariat	Mr. Jerome/ Mr. Noble/ Robert	+233240720640	n/a
GASIP	Mr. Stephen Debre	+233552260158	n/a
Chamber of Agribusiness, Ghana	Mr. Anthony Morrison	+233540742111	n/a
Republic Bank	Mr. Clement/Malik	+233240054948	n/a
National Insurance Commission (NIC)	Mr. Micheal Kofi Andoh Deputy Commissioner	+233202012680	kando@nicgh.org
ECOBANK	Mr. Mike	+233507448918 +233243557171	n/a
National Investment Bank (NIB)	Mr. Patrick/Mr. Kwaku Oppong Duah (Gen. Manager,	+233244782203 +233264866659	Kwaku.oppong-duah@nib-ghana.com

Appendices | Financial analysis of poultry - Layers

FINANCIAL ANALYSIS

Do Nothing Scenario - Self-funded Poultry (Layer) farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		408,786	434,539	471,475	513,437	563,753
Total inflows						
Labour costs		(42,948)	(45,654)	(49,534)	(53,943)	(59,229)
Operating costs		(295,276)	(313,878)	(340,558)	(370,867)	(407,213)
Indirect taxes		(16,744)	(17,799)	(19,312)	(21,030)	(23,091)
Loan interest		-	-	-	-	-
Capital expenditure	(47,060)	-	(27,519)	-	(16,453)	-
Total Outflows	**(47,060)**	**(354,968)**	**(404,850)**	**(409,404)**	**(462,293)**	**(489,533)**
Net Cash Flow	**(47,060)**	**53,818**	**29,690**	**62,072**	**51,143**	**74,220**

Financial Rate of Return	101.2%	Average Annual ROIC	12.2%
Financial NPV	**78,570**		

Proposed Scenario - FSRP Soft Loan-funded Poultry (Layer) farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		429,225	456,266	495,049	539,108	591,941
Total inflows						
Labour costs		(42,948)	(45,654)	(49,534)	(53,943)	(59,229)
Operating costs		(280,512)	(298,184)	(323,530)	(352,324)	(386,852)
Indirect taxes		(21,354)	(22,699)	(24,629)	(26,821)	(29,449)
Loan interest		(9,000)	(9,000)	(9,000)	(9,000)	(9,000)
Capital expenditure	(47,060)	-	(27,519)	-	(16,453)	-
Total Outflows	**(47,060)**	**(353,814)**	**(403,056)**	**(406,693)**	**(458,540)**	**(484,530)**
Net Cash Flow	**(47,060)**	**75,411**	**53,210**	**88,356**	**80,568**	**107,411**

Financial Rate of Return	151.4%	Average Annual ROIC	19.1%
Financial NPV	**140,559**		

Do Nothing Scenario - Loan-funded Poultry (Layer) farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		408,786	434,539	471,475	513,437	563,753
Total inflows						
Labour costs		(42,948)	(45,654)	(49,534)	(53,943)	(59,229)
Operating costs		(295,276)	(313,878)	(340,558)	(370,867)	(407,213)
Indirect taxes		(16,744)	(17,799)	(19,312)	(21,030)	(23,091)
Loan interest		(18,000)	(18,000)	(18,000)	(18,000)	(18,000)
Capital expenditure	(47,060)	-	(27,519)	-	(16,453)	-
Total Outflows	**(47,060)**	**(372,968)**	**(422,850)**	**(427,404)**	**(480,293)**	**(507,533)**
Net Cash Flow	**(47,060)**	**35,818**	**11,690**	**44,072**	**33,143**	**56,220**

Financial Rate of Return	61.6%	Average Annual ROIC	8.0%
Financial NPV	**34,561**		

Proposed Scenario - FSRP Interest Free Loan-funded Poultry (Layer) farmer

GHS	Years					
	0	1	2	3	4	5
Operating revenue		429,225	456,266	495,049	539,108	591,941
Total inflows						
Labour costs		(42,948)	(45,654)	(49,534)	(53,943)	(59,229)
Operating costs		(280,512)	(298,184)	(323,530)	(352,324)	(386,852)
Indirect taxes		(21,354)	(22,699)	(24,629)	(26,821)	(29,449)
Loan interest		-	-	-	-	-
Capital expenditure	(47,060)	-	(27,519)	-	(16,453)	-
Total Outflows	**(47,060)**	**(344,814)**	**(394,056)**	**(397,693)**	**(449,540)**	**(475,530)**
Net Cash Flow	**(47,060)**	**84,411**	**62,210**	**97,356**	**89,568**	**116,411**

Financial Rate of Return	170.7%	Average Annual ROIC	21.3%
Financial NPV	**162,563**		

Appendices | Economic analysis of poultry - Layers

ECONOMIC ANALYSIS

Do Nothing Scenario - Self-funded Poultry (Layer) farmer

GHS		Years					
	CF	0	1	2	3	4	5
Operating revenue	1.05		429,225	456,266	495,049	539,108	591,941
Total inflows							
Labour costs	0.95		(40,801)	(43,371)	(47,058)	(51,246)	(56,268)
Operating costs	0.95		(280,512)	(298,184)	(323,530)	(352,324)	(386,852)
Indirect taxes	0.00		-	-	-	-	-
Loan interest	n/a		-	-	-	-	-
Initial investments	n/a	(47,060)	-	(27,519)	-	(16,453)	-
Total Outflows		**(47,060)**	**(321,313)**	**(369,074)**	**(370,588)**	**(420,022)**	**(443,120)**
Net Cash Flow	n/a	**(47,060)**	**107,913**	**87,192**	**124,462**	**119,086**	**148,821**
Economic rate of Return		222.6%					
Economic NPV		**227,087**					

Proposed Scenario - FSRP Soft Loan-funded Poultry (Layer) farmer

GHS		Years					
	CF	0	1	2	3	4	5
Operating revenue	1.05		450,686	479,080	519,802	566,064	621,538
Total inflows							
Labour costs	0.95		(40,801)	(43,371)	(47,058)	(51,246)	(56,268)
Operating costs	0.95		(266,486)	(283,275)	(307,353)	(334,708)	(367,509)
Indirect taxes	0.00		-	-	-	-	-
Loan interest	n/a		-	-	-	-	-
Initial investments	n/a	(47,060)	-	(27,519)	-	(16,453)	-
Total Outflows		**(47,060)**	**(307,287)**	**(354,165)**	**(354,411)**	**(402,406)**	**(423,777)**
Net Cash Flow	n/a	**(47,060)**	**143,399**	**124,915**	**165,390**	**163,658**	**197,761**
Economic rate of Return		300.1%					
Economic NPV		**324,517**					

Do Nothing Scenario - Loan-funded Poultry (Layer) farmer

GHS		Years					
	CF	0	1	2	3	4	5
Operating revenue	1.05		429,225	456,266	495,049	539,108	591,941
Total inflows							
Labour costs	0.95		(40,801)	(43,371)	(47,058)	(51,246)	(56,268)
Operating costs	0.95		(280,512)	(298,184)	(323,530)	(352,324)	(386,852)
Indirect taxes	0.00		-	-	-	-	-
Loan interest	n/a		-	-	-	-	-
Initial investments	n/a	(47,060)	-	(27,519)	-	(16,453)	-
Total Outflows		**(47,060)**	**(321,313)**	**(369,074)**	**(370,588)**	**(420,022)**	**(443,120)**
Net Cash Flow		**(47,060)**	**107,913**	**87,192**	**124,462**	**119,086**	**148,821**
Economic rate of Return		222.6%					
Economic NPV		**227,087**					

Proposed Scenario - FSRP Interest Free Loan-funded Poultry (Layer) farmer

GHS		Years					
	CF	0	1	2	3	4	5
Operating revenue	1.05		450,686	479,080	519,802	566,064	621,538
Total inflows							
Labour costs	0.95		(40,801)	(43,371)	(47,058)	(51,246)	(56,268)
Operating costs	0.95		(266,486)	(283,275)	(307,353)	(334,708)	(367,509)
Indirect taxes	0.00		-	-	-	-	-
Loan interest	n/a		-	-	-	-	-
Initial investments	n/a	(47,060)	-	(27,519)	-	(16,453)	-
Total Outflows		**(47,060)**	**(307,287)**	**(354,165)**	**(354,411)**	**(402,406)**	**(423,777)**
Net Cash Flow	n/a	**(47,060)**	**143,399**	**124,915**	**165,390**	**163,658**	**197,761**
Economic rate of Return		300.1%					
Economic NPV		**324,517**					

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