

## **CONCEPT NOTE:**

### **SUPPORT FOR THE MECHANISATION OF RICE PRODUCTION**

#### **A. STRATEGIC CONTEXT OF THE PROJECT**

The Ministry of Food and Agriculture has its policy, Food and Agriculture Sector Development Policy (FASDEP II) and an Implementation Plan (METASIP) for the implementation of strategies to modernise agricultural sector through mechanisation to ensure food security and income diversification while targeting poor and risk prone and risk-averse producers.

In Ghana's quest for the attainment of sustainable rice-based production systems, agricultural mechanisation from a value chain perspective has come to the fore in policy considerations.

The policy strategies in achieving food security and poverty reduction have rice as one of the selected commodities. The sector seeks to target 80 % small scale rice farmers and 20% emergent commercial rice farmers as stated in the MEDUIM-TERM Agricultural Sector Investment Plan (METASIP). The specific objective of the sector is to

1. Improving the capacity of local rice industry to compete with imported rice in terms of price and quality.
2. Increasing the market share of local rice as against imported rice
3. Establish strategic stocks in rice.

One of the interventions proposed in the METASIP is to provide assistance to Private Sector to set-up commercially viable Agricultural Mechanization Services Enterprise Centers (AMSECs - bulldozers, combine harvesters, planters etc) at Strategic Locations.

Both FASDEP II and METASIP make mention of enhancing farmers and agro-processors access to mechanise services at affordable cost of which The Rural Technology and Information Unit (RTIU) of AESD is facilitating.

#### **B. JUSTIFICATION**

Given the importance attached to rice in Ghana's quest for food security and food sovereignty, it is necessary to raise the self-sufficiency from the current 35% to about 75%<sup>1</sup> by 2015. Agricultural mechanisation through the use of machinery is seen as one of the vehicles towards achieving this goal.

Unfortunately, in year 2000 tractor-farmer ratio stood at 1:1800 with an average age of tractors being over fifteen (15) years. Some farming districts and communities in the country

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<sup>1</sup> The country achieved 76% self-sufficiency in the 1970s; therefore the target of 75% is achievable with the right interventions.

do not have access to even a single agricultural mechanisation centres where farmers can access tractors or power tiller for land preparation. Farmer access to mechanized services in all the other stages of crop production (planting, crop maintenance, harvesting, processing, etc) is similar to that of land preparation.

The current high level of post-harvest losses in the country can be partly attributed to limited availability of agricultural machines for timely operations from land preparation to harvesting.

About thirty percent (30%) of the produce is lost owing to poor land preparation, planting, harvesting, post- harvest handling, storage, and processing methods. The low level of engineering technology inputs in agriculture has been cited as one of the major constraint hindering the modernisation of agriculture and food production including rice. In Ghana, farm power relies overwhelmingly on human muscle power, based on operations that depend on the hoe and other hand tools. The results are that serious limitations are placed on the amount of land that can be cultivated per family. It also reduces and limits the effectiveness of essential farm operations such as cultivation and weeding, thereby reducing crop yields.

In the past, large scale investment in agricultural mechanisation services, as a way of intensifying crop production has been limited to medium to large commercial farmers. Most of the tractor hire schemes which are few across the country meant for small scale farmers has not been effectively utilised. If this situation persists it is likely to cause disinterest of farmers in agricultural mechanisation in general.

The way forward is to ensure that appropriate equipment needs are made available through private distributors and service providers to allow production to become increasingly mechanized. For this reason the government has identified the private sector to be better equipped to look after the day-to-day provision of farm inputs including machinery and associated vital machinery support services. As part of the Ministry's Accelerated Agricultural Mechanisation policy five thousand (5,000) of 30-50kW tractors has been imported and made available to farmers and other private sector operators giving them the opportunity to acquire within an agreed repayment arrangement.

However this number is inadequate to cater for the high demand of machinery services as well as having the full complement of machinery along the rice chain. In addition the ministry on behalf of the government is collaborating with the Japanese government under

the Kennedy Round 2 facility (KR2) to support underprivileged rice farmers' to have an easy access to agricultural machinery and equipment.

This Concept Note seeks to offer options for a large scale replication of the Scheme.

### **C. POTENTIAL INTERVENTION ZONES AND TARGET GROUPS**

Based on the existing rice growing systems, namely irrigated, lowland, rain-fed-lowland, and upland, the appropriate farmer groups will be targeted. In addition to farmers the following beneficiaries will also be targeted; machine fabricators and repairers, processors and millers, traders, transporters (haulers), local researches etc. The distribution of this agricultural machinery will be targeted to the potentially high rice producing districts. In addition the targeted beneficiaries should show their willingness and commitment in accessing the support provided within the framework of this project.

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### **D. OBJECTIVES**

Main objective of the project is “To accelerate modernisation and commercialisation of rice production through expanded use of mechanisation services”.

Specific objectives of the project are:

1. To enhance the use of agricultural machinery to improve the timeliness and efficiency of farm operations in rice based systems to commercialise rice production.
2. To provide support for private sector led entrepreneurship and investment in agricultural machinery management, maintenance, and service provision..
3. Build capacity of experts and technicians for improved operations and maintenance of agricultural machinery.

### **E. DESCRIPTION OF THE COMPONENTS, OUTPUTS, AND ACTIVITIES**

#### **COMPONENTS**

#### **Component 1: Enhancing Agricultural Machinery Usage**

Under this component private ownership is considered as the best approach for mechanisation service provision. Partial subsidies will be used as temporary measure to lower prices to enhance the private sector to access mechanised services.

Similarly financing modalities such as hire purchase or leasing will be used as a way of encouraging private ownership of machinery.

#### Outputs

- 1.1 Collaborate with the private sector to own agricultural machinery plant pools.
- 1.2 Facilitate a mechanism for at the 20% large scale actors along the value chain to acquire or lease agricultural machinery through the provision of subsidies and credit.

#### **Component 2: Equipment Maintenance and Management**

To sustain the increased use of agricultural machinery, a scheme for frequent maintenance will have to be incorporated into the operational plan of the support system. This project proposal suggests a comprehensive equipment management and maintenance scheme by entrepreneurs and users of the facilities.

#### Outputs

- 2.1 Maintenance cycles for sets of equipment drawn and operated
- 2.2 Capacity of specialised garages to maintain the machinery identified and built

#### **Component 3: Capacity Building and Farm Power R & D**

Under this component, efforts will be made to ensure priorities are set for a comprehensive agricultural engineering, R & D programme in the academia.

To encourage academic institutions to plan research programmes to address problems faced by the farming sector in machinery usage.

#### Outputs

- 3.1 Academic and research institutions to run short courses in agricultural machinery (assembling, fabrication and maintenance) supported
- 3.2 Strengthen the RTIU of AESD to develop extension dissemination modules of R & D findings.

#### **Component 4: Artisanal Development and Fabrication of Machinery and Parts.**

This will involve the training of first line artisans and operators.

#### Outputs

- 4.1 Building capacity of 50 -100 local artisans and entrepreneurs to manage the assembling/fabrication plants.

- 4.2. Train experts to collaborate with relevant manufacturers to develop machinery prototypes in joint efforts.
- 4.3. Incorporate design modifications in machinery prototypes to reduce the local manufacturing and production costs

#### ACTIVITIES

- I. Facilitate fabricators' access to credit to establish/expand machinery pools
- II. Ensuring that assembling/fabrication centres are appropriated sited
- III. Generate commercial demand for the locally produced prototypes through promotional activities and demonstrations through Fairs and exhibitions.
- IV. Build capacity of fabricators in the manufacture of appropriate machinery and equipment for the rice sector
- V. Identify rice machinery operators and mechanics for training
- VI. Conduct training-needs assessment and develop training modules
- VII. Train selected mechanics on maintenance of machinery like tractor, power tillers, pumps, mills, threshers, par-boilers, cleaners etc.
- VIII. Set up a collaborative mechanism with the engineering faculties of relevant institutions for research and training.
- IX. Organise scheduled in-service training for MoFA staff on the use of agricultural machinery.

#### F. COSTING AND FINANCING

The costing and financing summary is as indicated below.

	Item	Quantity	Total Cost \$'m
1.	Machinery/Equipment	1000 tractors, 10 earth movers, 500 power tillers, 50 planters, 100 reapers, 50 combine harvesters, 100 threshers, 50 land levellers.	60.00
2.	Training/Extension/Consultancy	100 engineers, 1000 machine operators and technicians. 50- 100 local	5.00

		entrepreneurs	
3.	Operational funds		15.00
4.	Works		20.00
	Total		100.00

### **G. MPLEMENTATION STRATEGY OF THE PROJECT**

This will be a typical PPP arrangement by which government will initially facilitate the importation of the machines and give to the private sector entrepreneurs to acquire and operate as business enterprise. To ensure commitment of repayment an oversight committee will be set up comprising representatives of MOFA, the, Financial Institution, the Mechanised Services Centres, Farmer Representatives and District Assembly.

### **H. PROJECT ORGANISATION AND MANAGEMENT**

The project will be executed by MoFA through a steering committee at the national level. A similar committee will be replicated at Districts. Such committees will be co-chaired by a representative each of the ministry and the private sector.

### **I. MONITORING AND EVALUATION**

There will be an M & E system designed for the project. This scheme will define all the data that are required to be collected during implementation. In addition the appropriate indicators will be outlined.

Please refer to annex for the logical framework containing the full list of indicators.

### **J. RISKS**

Possible variations in inflation and lending rate may cause entrepreneurs to default payment of the equipment.

Climate change effects like floods and drought leading to actors not making the acceptable margins can affect the efficient use of the machinery

Similarly if factors such as improved seeds, rainfall, good agricultural practices, etc are lacking it may lead to low production hence low earning for farmers will affect their ability to pay for mechanisation services rendered.

Inability to fabricate or stock back up parts can affect the sustainable use of the machines.

Government inability to source enough funds can affect the smooth implementation of the project.

## LOGICAL FRAMEWORK

Project/Program	Objectively Verifiable Indicators (O.V.I)	Means of Verification	Important Assumptions/Risks
<b>Support for mechanization of rice production</b>			
<p>- <b>Main objective</b></p> <p>To accelerate modernisation and commercialisation of rice production through expanded use of mechanisation services</p> <p><b>Specific objectives:</b></p> <ol style="list-style-type: none"> <li>To enhance the use of agricultural machinery to improve the timeliness and efficiency of farm operations in rice based systems to commercialise rice production.</li> <li>To provide support for private sector led entrepreneurship and investment in agricultural machinery management, maintenance, and service</li> </ol>	<p>Rice sector mechanised</p> <p>Timeliness and efficiency of farm operations enhanced</p> <p>Level of patronage of mechanized services along the value chain increased</p> <p>Number of investors/entrepreneurs</p> <p>Number of established service centers functioning</p>	<p>Number of value chain stages mechanized nationwide.</p> <p>M &amp; E reports /commissioned studies</p> <p>M &amp; E reports /commissioned studies</p>	<p>Possible variations in inflation and lending rate may cause entrepreneurs to default payment of the equipment.</p> <p>Climate change effects like floods and drought leading to actors not making the acceptable margins can affect the efficient use of the machinery</p> <p>Similarly if factors such as improved seeds, rainfall, good agricultural practices, etc are lacking it may lead to low production hence low earning for farmers will affect their ability to pay for mechanisation services</p>

<p>provision..</p> <p>3. Build capacity of experts and technicians for improved operations and maintenance of agricultural machinery.</p>	<p>Number of experts trained</p> <p>Number of technicians trained</p> <p>Number of experts/technicians employed by the services centres and individual farmers owning machinery</p>	<p>M &amp; E reports. Commissioned studies.</p> <p>M &amp; E reports/Reports from the institutions/employment creation studies/Staff list from centres</p>	<p>rendered.</p> <p>Inability to fabricate or stock back up parts can affect the sustainable use of the machines.</p> <p>Government inability to source enough funds can affect the smooth implementation of the project.</p>
<p><b>Outputs</b></p> <p>1.1 Collaborate with the private sector to own agricultural machinery plant pools.</p> <p>1.2 Facilitate a mechanism for the 20% large scale actors along the value chain to acquire or lease agricultural machinery through the provision of subsidies and credit.</p>	<p>Agricultural Machinery Plant Pools owned by private entrepreneurs</p> <p>No./ (%) of farmers owning agric machinery</p> <p>No. / (%) of millers with improved equipment</p> <p>No. / (%) of artisans involved with agricultural machinery</p>	<p>M &amp; E reports/AGI reports</p> <p>M &amp; E reports/Farm studies reports</p>	

2.1 Draw and operate maintenance cycles for sets of equipment	Maintenance cycles drawn and operational	M & E reports	
2.2 Identify and build capacity of specialised garages to maintain the machinery	No. of specialised garages identified No. of Personnel of garages whose capacity has been built	M & E reports/Reports from training centres	
3.1 Support academic and research institutions to run short courses in agricultural machinery (assembling, fabrication and maintenance).	List of collaborating academic and research institutes/List of short courses in agricultural machinery actually run by academia and research institutes.	M & E reports/Reports from institutions	
3.2.Strengthen the RTIU of AESD to develop extension dissemination modules of R & D findings.	No. of extension modules developed and disseminated	M & E reports/Reports from AESD	
4.1 Building capacity of 50 -100 local artisans and entrepreneurs to manage the assembling/fabrication plants.	No. of local artisans and entrepreneurs whose capacity has been enhanced	M & E reports/	
4.2. Train experts to collaborate with relevant manufacturers to develop machinery prototypes in joint efforts.	No. of experts collaborating with manufacturers./No. of experts trained/No. of organisations developing machinery prototypes/No. of prototypes developed	M & E reports/Industrial reports	

