



**New Partnership for
Africa's Development (NEPAD)
Comprehensive Africa Agriculture
Development Programme (CAADP)**



**Food and Agriculture Organization
of the United Nations
Investment Centre Division**

GOVERNMENT OF THE REPUBLIC OF GHANA

SUPPORT TO NEPAD–CAADP IMPLEMENTATION

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Volume III of III

BANKABLE INVESTMENT PROJECT PROFILE

Post Harvest Systems and Agro–processing Support Project

September 2005

GHANA: Support to NEPAD–CAADP Implementation

Volume I: National Medium–Term Investment Programme (NMTIP)

Bankable Investment Project Profiles (BIPPs)

Volume II: Small–scale/Micro–scale Irrigation and Drainage Project

Volume III: Post harvest Systems and Agro–processing Support Project

NEPAD–CAADP BANKABLE INVESTMENT PROJECT PROFILE

Country: Ghana

Sector of Activities: Agribusiness

Proposed Project Name: **Post Harvest Systems and Agro–processing Support Project**

Project Location: National

Duration of Project: 5 years

Estimated Cost: Foreign Exchange.....US\$16.5 million
Local Cost.....US\$26.5 million
Total..... US\$43.0 million

Suggested Financing:

<i>Source</i>	<i>US\$ million</i>	<i>% of total</i>
<i>Government (both Central and Local Governments)</i>	8.6	20
<i>Financing institution(s) (Grants and Loans)</i>	25.8	60
<i>Beneficiaries (User Communities)</i>	4.3	10
<i>Private Sector</i>	4.3	10
<i>Total</i>	43.0	100

GHANA:

NEPAD–CAADP Bankable Investment Project Profile

“Post Harvest Systems and Agro–processing Support Project”

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Currency Equivalents

(June 2005)

Local Currency	=	Cedi (¢)
US\$1.00	=	¢9,000
¢1,000	=	US\$0.11

Abbreviations

ADB	Agricultural Development Bank
AESD	Agricultural Engineering Services Division
AGSSIP	Agricultural Services Sub-Sector Investment Programme
AMIS	Agricultural Machinery Industrial Service
CAADP	Comprehensive Africa Agriculture Development Programme
CEPS	Customs Excise and Preventive Service
CFC	Common Fund for Commodities of the United Nations
CIDA	Canadian International Development Agency
COCOBOD	Ghana Cocoa Marketing Board
CSIR	Council for Scientific and Industrial Research
DA	District Assembly
DOC	Department of Cooperatives
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FASDEP	Food and Agriculture Sector Development Policy
GDP	Gross Domestic Product
GFDC	Ghana Food Distribution Corporation
GLDB	Grains and Legumes Development Board
GoG	Government of Ghana
GPHA	Ghana Ports and Harbours Authority
GPRS	Ghana Poverty Reduction Strategy
GRATIS	Ghana Regional Appropriate Technology Information Services
GSB	Ghana Standards Board
IOPG	Institute of Packaging, Ghana
ITTU	Intermediate Technology Transfer Unit
KNUST	Kwame Nkrumah University of Science and Technology
MASDAR	MASDAR (UK) Ltd
MDA	Ministries, Departments and Agencies
MFEP	Ministry of Finance and Economic Planning
MLGRD	Ministry of Local Government and Rural Development
MOFA	Ministry of Food and Agriculture
MOH	Ministry of Health
MOTI/PSI	Ministry of Trade, Industry and Presidential Special Initiatives
NAGEM	National Association of Agricultural Equipment Manufacturers
NAWO	National Association of Warehouse Operators
NEPAD	New Partnership for Africa’s Development
NGO	Non-governmental Organization
NMTIP	National Medium-Term Investment Programme
NRI	Natural Resources Institute (UK)
PBC	Produce Buying Company
PPRSD	Plant Protection and Regulatory Services Directorate

PSI	Presidential Special Initiatives
PSM	Private Sector Ministry
REDP	Rural Enterprises Development Programme
RTTC	Regional Technology Transfer Centre
SPFS	Special Programme for Food Security
SRID	Statistics, Research and Information Directorate
TCC	Technology Consultancy Centre
TOR	Terms of Reference
UNIDO	United Nations Industrial Development Organisation
VAT	Value Added Tax
VIP	Village Infrastructure Project
WIAD	Women in Agricultural Development
WIC	Warehouse Inventory and Credit System
WRS	Warehouse Receipts System

I. PROJECT BACKGROUND

A. Project Origin

I.1. The *Post-harvest Systems and Agro-processing Support Project* was identified following the preparation of the National Medium-Term Investment Programme (NMTIP) for Ghana, and a stakeholder workshop held on 9 and 10 June 2004 that reviewed the NMTIP and ascertained development priorities. The NMTIP was prepared within the framework of NEPAD’s Comprehensive Africa Agriculture Development Programme (CAADP). The project directly relates to Priority Areas 2 (Improvement of Rural Infrastructure and Trade-related Capacities for Improved Market Access) and 3 (Promotion of Agro-processing) of the NMTIP and consequently supports CAADP Pillar 2 (Improvement of Rural Infrastructure and Trade-related Capacities for Improved Market Access).

I.2. Efficient post-harvest management and agro-processing technologies are an important pre-requisite for increased income from agricultural production as well as for household and national food security. While it is recognized that the post-harvest and agro-industry sub-sector is clearly the domain of the private sector, there is the need to create an enabling environment for the development of the sub-sector and to promote the establishment of effective links between producers, traders and agro-industries. It is also recognized that commercial agro-processing and post-harvest handling systems would only be economically viable when undertaken by specialised entrepreneurs as a market-oriented and profit-making business.

I.3. This project originated from the Post Harvest Unit, Agricultural Engineering Services Division (AESD) of the Ministry of Food and Agriculture (MOFA). The original concept was modified with a focus to strengthen commodity and industry associations and fully involve them in project implementation. MOFA primarily deals with farmers, while the focus of this project is on commercial processors and agribusinesses. Therefore, a broader coalition of stakeholders, including other ministries that deal with the relevant target beneficiaries (Ministry of Trade, Industry and Presidential Special Initiatives-MOTI/PSI; Ministry of Finance and Economic Planning-MOFEP; Private Sector Ministry-PSM), as well as the private sector businesses themselves were consulted.

I.4. The project proposal was prepared in collaboration with staff from the MOFA units that relate most to the sectors of concern (AESD, Women in Agricultural Development-WIAD, Statistics, Research and Information Directorate-SRID). Extensive discussions were held with and inputs received from MOTI and MOFEP (especially relating to ongoing relevant projects such as the Agricultural Machinery Industrial Service (AMIS) Project and the Millennium Challenge Account Proposal by Government of Ghana (GoG) that mainly focus on agribusiness). Private sector businesses, sector-specific industry associations, relevant non-governmental organisations (NGOs) and industry experts were consulted extensively (see List of Persons Contacted in Annex 5).

I.5. The proposed project would comprise the following four components:

- Support to small- and medium-scale manufacturers of machinery to manufacture and effectively market high quality agro-processing machinery and equipment;
- Support to professionally managed warehouses at major producing and marketing centres;
- Support to appropriate packaging and cool chain technology, facilities and support to farmers, traders and processors for commercialization; and
- Promotion of the use of measures and weights for trading in agricultural commodities in Ghana.

B. General Information

I.6. Agriculture is the main economic sector in Ghana, accounting for about 41 percent of GDP and generating 55 percent of foreign exchange earnings. The agriculture sector is the main source of employment and income for 70 percent of the rural workforce. In addition, this sector contributes an average of 12 percent and 8 percent, respectively to tax revenue and total revenue. Ghana can therefore not achieve economic growth and poverty reduction without significant improvement in the agriculture sector.

I.7. Post-harvest losses have been a major problem in Ghana’s agriculture for a very long time. Every sub-sector of agriculture viz., crops, livestock and fishery experiences high losses ranging between 15 and 50 percent of production. There is inadequate market infrastructure in the production and consuming centres and most market places lack appropriate handling, storage and warehousing facilities. Although Ghana exports significant quantities of horticultural products to earn foreign exchange, full values of these products are not realized due to their rather poor quality, as a result of inappropriate handling and storage of most of the commodities at farm-level, market centres, harbours and airports.

I.8. The project being proposed here is aimed at establishing comprehensive post-harvest systems and an agro-processing support base in the country and would complement on-going post-harvest systems, agro-processing and marketing initiatives. The main ongoing initiatives include the following:

- Promoting growth through private sector led agribusiness development (Proposal to Millennium Challenge Account);
- Agricultural Services Sub-Sector Investment Programme (AGGSIP). Purchase of agro-processing equipment for sale to farmers and processors (World Bank);
- Agricultural Machinery Industrial Service (AMIS) Project. Establishment of an Agricultural Machinery Industrial System (UNIDO);
- Promoting the use of weights and measures in agricultural trade (CIDA & USAID);
- HIPC Initiative. Purchase of agro-processing equipment and household food storage equipment (World Bank/ IMF); and
- Agricultural Services Sub-Sector Investment Programme (AGGSIP). Horticultural, Export Industry Initiative (World Bank).

I.9. The various project components proposed would complement the above interventions in order to remove the constraints that are most limiting to the development of the post-harvest and agro-processing sub-sector, and thereby contribute to improved farmers’ incomes and welfare.

I.10. The Food and Agriculture Sector Development Policy (FASDEP) identified the following two key factors contributing to the poor performance of the sub-sector: (i) *infrastructure* – inadequate processing facilities, inadequate and inappropriate storage facilities, poor, unattractive and unhygienic packaging; and (ii) *technological factors* – slow pace of appropriate technology development and over-reliance on importation of machinery spares and other inputs.

I.11. Key Government strategic thrusts to address the above constraints, as presented in the Ghana Poverty Reduction Strategy (GPRS) and the FASDEP, are in the areas of: (i) enhancing human

resource development and institutional capacity; (ii) appropriate technology; (iii) improved infrastructure; and (iv) improved access to market (see Annex 2, Box 1 for details).

I.12. **Institutions.** The following institutions have contributed to the preparation of this project and would be involved in its implementation:

- The *Ministry of Food and Agriculture (MOFA)*: the primary government institution responsible for agricultural development in Ghana. The main goal of MOFA is to create the environment for sustainable growth and development in the agricultural sector that would ensure food and raw material security, reduction in poverty and the creation of wealth, and greater contribution of the sector to GDP, foreign exchange earnings and government revenue.
- The *Agricultural Engineering Division (AESD)* of MOFA, and specifically the Post Harvest Unit, has been involved in project identification and formulation. The Division and Unit would be involved in coordination of the implementation of the various programmes under this project.
- The *Women in Agricultural Development Division (WIAD)* of MOFA was also involved in project formulation, and would also be involved in programmes that relate to them. WIAD is involved in the promotion of quality and hygienic processing, preservation and utilization of priority crops (such as cassava, sweet potatoes, soybeans and cashew, vegetables and fruits as well as animal and fish products). WIAD transfers appropriate technologies (processing, preservation and handling) to farm families, women groups and individuals involved in small to medium-scale processing (cassava processing into *gari*, and high quality flour for making pastries and cookies, palm oil and other oils, fish and meat processing). Technology transfer is usually in the form of training and workshops. WIAD is currently constructing a Food Trial and Development Centre at the Head Office, where training would be given to women groups and other interested parties in hygienic and quality food processing, preservation and marketing. The structure is almost complete. WIAD, however, at the moment does not have adequate number of qualified staff to handle this area, hence the need for support in hiring professional staff to run the programme. Funding would be provided in this project for that.
- The *Statistics and Research and Information Division (SRID)* of MOFA, especially the Marketing Unit, has led efforts and worked closely with the Ghana Standards Board (GSB) on the project component on the promotion of the use of standard weights and measures in agricultural trade. SRID has started the pilot component project, with funding of about US\$150 000–200 000 from international donors to cover the purchase of scales and plastic containers, programme promotion, training of the market women, and follow-up monitoring. They would play a key role in the implementation of that component.
- The *Ministry of Trade and Presidential Special Initiatives (MOTI/PSI)*. This ministry plays a key role in the sub-sector and would particularly be involved in two components of this project. MOTI/PSI designed the existing Agricultural Machinery Industrial Service (AMIS) Project, with the assistance of UNIDO. MOTI would be assigned the lead role in the agricultural machinery development initiative under the **Modified-AMIS** being proposed under this project, while AESD would assist technically. The Ministry, through the Ghana Standards Board would also be involved in the component on the use of standard weights and measures in agricultural trade.

- *The Ministry of Finance and Economic Planning (MOFEP)*. MOFEP has submitted a country proposal for funding by the US Government Millennium Challenge Account. The proposal for promoting growth through private sector led agribusiness development requested US\$290m. Their proposal includes funding the establishment of agribusiness development centres and pack-houses for key export crops. Both their initiative and the AGGSIP proposal for pack-houses cover export crops are complementary to the cold storage and pack-house component proposal presented in this BIPP.

I.13. Other government institutions which provide infrastructural and other services or programmes relevant to the project include: (i) Private Sector Ministry; (ii) Ministry of Roads and Transport; (iii) Ministry of Lands and Forestry; (iv) Ministry of Women and Children’s Affairs; and (v) Ministry of Local Government and Rural Development.

I.14. NGOs provide varied specialized services related to food security in the areas of credit delivery, promotion of group farming, assistance to farmers in the preparation of bankable projects to access loans, environmental protection, farming, women’s welfare, food production, processing, storage and distribution etc. Such NGOs include TechnoServe, ADRA, Action Aid, OXFAM, and World Vision International.

I.15. The private sector is the key player in agro-processing and agribusiness, both at the rural areas and in the urban centres. The most extensive and widely spread post-harvest activity by the non-farmer private sector is the purchase of harvested produce for transport to and sale at district regional and other urban markets. However, not much off-farm storage of produce occurs, and the only warehouses worth noting are those operated by the public company Ghana Food Distribution Cooperation (GFDC) in mainly grain producing areas of Ashanti and Brong Ahafo Regions. Agro-processing is very basic and rudimentary and occurs in the farming areas, close to the farms and for consumption mainly in the local area. Commercial agro-processing that would attract significant investment from the private sector is lacking. It is envisaged that the initiatives described in the various components of this project would encourage commercial level agro-processing and general agribusiness in the rural areas and the bigger commercial centres in the districts, regions and the urban towns.

II. PROJECT DESCRIPTION

Component 1: Supporting Small- and Medium-Scale Manufacturers to Manufacture and Effectively Market High Quality Agro-Processing Machinery and Equipment

(i) Background

II.1. The Government is presently seeking funding for the *Agricultural Machinery Industrial Service (AMIS) Project* that was designed with technical and financial assistance of UNIDO. Under the joint agreement the implementing agency is MOTI/PSI and UNIDO is the executing agency, which has a Programme Manager in the UNIDO office in Accra. The AMIS Project would have the following objectives:

- To identify essential PSI-related equipment for prototyping, field testing and adaptation for mass production by local manufacturers using the value chain analysis and following the case study of the manual cassava harvester.

- To establish an efficient and reliable agro-machinery-supply, repair and maintenance, and exploitation system in the project coverage areas.
- To devise and execute a national advocacy and publicity campaign illustrating the benefits, acquirement, and use of PSI standardized equipment for economical exploitation and income generation.

II.2. The above AMIS Project would primarily involve providing machine tools and facilities to Ghana Regional Appropriate Technology Industrial Services (GRATIS) Foundation in Tema, the Technology Consultancy Centre (TCC) and Suame Intermediate Technology Transfer Unit (ITTU) in Kumasi, so that they would serve as centres of excellence for adaptation of agro-mechanization technologies for local production. They would offer training to small- and medium-scale manufacturers in the manufacture of quality agricultural machinery and equipment, using high quality food grade raw materials.

II.3. Capacities of participating associations and their privately operated workshops at both regional and district levels would be increased through provision of machine tools, to produce standard parts and components as well as standardized machines and equipment. Financing and leasing modalities would be provided to the manufacturers to make acquisition of required machinery possible. Appropriate standards setting and verification is to be included in the programme, to support all equipment-related requirement of the programme.

II.4. The proposal of the Modified-AMIS presented in this BIPP has been reviewed by UNIDO and MOTI, which are generally in agreement with the modifications proposed and would be ready to support the proposal. This component includes the following modifications:

- Setting up a National Association of Agricultural Equipment Manufacturers (NAGEM), with a professionally staffed secretariat that would offer critical support services and funds to the members, for effective growth of the industry; and
- Setting up a programme for promoting the primary processing and utilisation of indigenous food ingredients in normal food intake, with a professionally staffed secretariat that would be based in MOFA-WIAD.

II.5. The GRATIS Foundation, TCC and the regional ITTUs have conducted numerous training courses for local manufacturers of various agro-processing equipment for almost all the major crops in Ghana for the past 10 years. However, an assessment of the Ghana Agro-Industry Sector¹ revealed that, though the technical knowledge exists among the manufacturers, the effective demand for their machinery is limited. It is therefore crucial to make an assessment of market and commercial feasibility of their proposed business activities to ensure that they are economically viable. The raw materials used are of poor quality, and in many cases unsafe for use in the manufacture of food processing equipment. The background, functions and services of training centres supporting small-scale industrialization and agro-processing in Ghana are presented in Annex 2, Box 2.

II.6. The market analysis would include an assessment of the viability of micro- and small-scale processing, in particular when high quality – high cost equipment is used. MOFA-AESD supports the use of high quality food-grade raw materials in equipment manufacturing. Mass production would lower the unit costs and prices, making the equipment more affordable and more marketable. High standard equipment has a longer life, and so can be supported by medium-term loans. Product associations and processors would be given medium-term loans to purchase the equipment under the project.

¹ Ghana Agro-Industry. MASDAR (U.K) LTD. (2001).

(ii) Area

II.7. This component would cover the whole nation, with GRATIS Foundation, Tema offering training for manufacturers in the southern sector and the TCC and Suame ITTU, Kumasi doing so for the middle and northern sector. Initially, the national head office of the NAGEM in Accra would cover the whole country, with the zonal offices later set up in Kumasi for the middle sector and that in Tamale for the northern sector.

(iii) Rationale

II.8. Agro-processing is acknowledged as an important and viable means of utilizing agricultural produce to extend the shelf life, improve storage and utilization, and for that matter reduce the negative seasonal impacts while improving food security. The principal justification for developing proper technological knowledge is to facilitate and equip local enterprises with the ability to fabricate component and replacement parts, manufacture and assemble machines and equipment to support efficient and effective operations within the sector.

II.9. Studies have shown that there is complete lack of precision tooling facilities, forging plants and reasonable metal coating capacities in Ghana, to facilitate the manufacture of precision parts and components as well as good quality products. Therefore, the principal focus of the component is oriented towards developing local manufacturing facilities that are capable of responding to these needs in agriculture production and agro-processing. This would ensure that the manufacturing and repair facilities and infrastructure are properly developed for growth in the agricultural systems and production base.

(iv) Objectives

II.10. The *development objective* of the component is to improve the financial well-being of farmers, agro-processors and agribusinesses by providing reliable supply of quality and maintainable agricultural machinery, equipment, implements and tools, which operate efficiently and optimally under rural conditions.

II.11. The *specific objectives* are:

- to establish efficient and reliable supply of quality and standardized agro-machinery, equipment, implements, tools, replacement parts and components to especially the small and medium-scale agro-industrial enterprises;
- to promote economically viable operation of small-scale agro-industrial entrepreneurs in rural and remote communities;
- to provide support to local manufacturers, through the establishment of an industry association to offer critical services such as sourcing and funding of quality raw materials for members, training in collaboration with training organizations, education on standards and regulations by GSB;
- to support MOFA-WIAD to effectively run training programmes in the Food Trial and Development Centre for women groups in hygienic and quality food processing, preservation and marketing;

- to promote the use of locally manufactured machinery and equipment in the agro-processing sub-sector, through market research and advertising by the industry association; and
- to promote market-oriented production and appropriate simple technologies for basic storage and processing at household and community level aimed at improving household food security.

(v) *Description*

II.12. This component would strengthen activities among key operatives within the sub-sector, by incorporating the establishment of a National Association of Agricultural Equipment Manufacturers (NAGEM). It would also provide support to MOFA-WIAD to complete, equip, properly staff and run programmes for the period in the Food Trial and Development Centre, where training would be given to women groups and other interested parties in hygienic and quality food processing, preservation and marketing. This component would place effective management organizations in the critical areas of the overall industry that will ensure that artisans receive the necessary support for successful manufacture of high quality machinery and equipment for Ghana.

II.13. MOFA and GSB do not have the required specific regulations, the staff and resources to enforce laws relating to the use of high quality materials and manufacturing standards in agricultural machinery and equipment. Under this component, a programme would be set up so that these government institutions can offer these services to the industry, to ensure high standards in locally manufactured equipment. MOFA and MOTI/PSI (GSB) would lead in efforts for the enactment and enforcement of regulations on the use of high quality materials in the manufacture of machinery, with high standards in operating and safety features.

II.14. The setting up of the NAGEM, with a secretariat of professional staff, would provide the necessary foundation of proper advisory, coordinating and facilitating functions in the critical areas of needed support such as market research and promotion of the use of locally manufactured machinery, assistance in sourcing supplies and funding for high quality raw materials such as steel. Sustainability of the NAGEM would be ensured through membership fees and user rates charges to members for the use of various facilities and services.

II.15. In addition, supporting MOFA-WIAD to effectively run programmes for the period in the Food Trial and Development Centre, where training would be given to women groups and other interested parties in hygienic and quality food processing, preservation and marketing, would promote the development of agro-processing among women in the private sector.

II.16. *Main outputs:*

- Market research performed on demand for agricultural machinery.
- Assessment of the economic viability of various agro-processing technologies and enterprise models available.
- National Association of Agricultural Machinery Manufacturers set up with a secretariat of professionals to provide advisory, coordinating and facilitating functions in the development of the sector.

- Local chapters formed nationwide to work with National Association staff to benefit from services.
- Use of good quality locally-made equipment promoted among agro-processors.
- Agricultural machinery and equipment manufacturers trained by GRATIS and TCC/ITTU in using high quality raw materials for manufacture of high standard equipment.
- Agricultural machinery manufacturers and agro-processors trained in entrepreneurship and management skills.
- Credit provided to association members to purchase raw materials and basic machine tools for manufacturing. (Credit funds would be administered by local banks such as Agricultural Development Bank or the rural banks).
- Members assisted to source, purchase and distribute high quality raw material such as steel.
- Machine tools and other facilities provided to GRATIS and TCC/Suame ITTU Kumasi.
- Trained manufacturers assisted to establish private machine tool centres in key production areas nationwide.
- Programme set-up for MOFA and GSB to support enactment and enforcement of regulations on the use of high quality raw materials in the manufacture of machinery with high standards in operating and safety features.
- Support to effectively run training programmes in the Food Trial and Development Centre, so promoting the development of agro-processing among women in the private sector.

II.17. **Main activities.** The component would assist in setting up a National Association of Agricultural Equipment Manufacturers, with a secretariat of professionals in Accra. Funding would be provided for an office in Accra, with staff headed by an Executive Secretary. Two zonal offices would be set up in Kumasi and Tamale in Project Year 2. During the project period of five years the offices and operations would be fully funded. However, minimum fees would be charged to members for such activities as bulk purchases for good quality raw materials, training etc. The association would have advisory, coordinating and facilitating functions in the area of manufacturing and marketing agro-processing machinery and equipment in Ghana. It would provide services that would be vital to the development and growth of the industry in the next five years. Services that the association would offer to members include:

- Perform market research of the demand for agro-processing machinery and equipment in Ghana and the West African sub-region.
- Carry out economic analysis of various agro-processing technologies and enterprise models.
- Promote the use of locally-made equipment among agro-processors.
- Assist members to source and purchase high quality raw materials for manufacturing (e.g. steel).

- Assist members with credit for purchasing raw materials and basic machine tools for their manufacturing.
- Collaborate with GRATIS and Kumasi ITTU, to offer training to members. Manufacturers, identified through the association, will be trained at GRATIS in Tema and the Kumasi Suame ITTU. The training would cover the manufacture of high quality equipment, using good quality material and the most appropriate technology of high standards.
- Provide training to agricultural machinery manufacturers and agro-processors in entrepreneurship and business management skills.
- Provide machine tools and other facilities at GRATIS, Tema and TCC/ITTU Kumasi for training manufacturers, together with a secretariat to run the training programme.
- Provide training of members by GRATIS, Tema and TCC/ITTU Kumasi.
- Facilitate trained manufacturers in the private sector to establish machine tool centres that are linked to GRATIS/ITTUs in the regions.

II.18. The component would also set up a programme in which GSB and MOFA would support the enactment and enforcement of regulations of relating to the use of high quality materials and high manufacturing standards in agricultural machinery and equipment. This programme would have a secretariat based at GSB, with officers seconded from related implementing agencies such as MOFA. The programme would be funded to support staff, facilities and equipment in the secretariat, so that it can offer services to the industry, ensuring high standards in locally manufactures equipment. The secretariat would work very closely with the NAGEM, in identifying target manufacturers to be assisted to meet the regulations.

(vi) Indicative Costs

II.19. Total component cost over the five-year implementation period is estimated at US\$12.7m. Details of cost estimates by main activity, broken down by project year and local/foreign cost are presented in Tables 1a and 1b in Annex 1).

(vii) Proposed Sources of Financing

II.20. UNIDO has financially and technically supported activities in industrial development and trade relating to manufacturing of agro-processing under the Ministry of Trade, Industry and Presidential Special Initiatives, including a budget of about US\$1.77m for the existing AMIS. UNIDO has reviewed the Draft Proposal of the Modified-AMIS presented here and is generally in agreement with the modifications proposed, ready to support the proposal and to assist GoG to seek donor funding. However, according to information obtained from the UNIDO Accra office responsible for AMIS, no funding has been obtained for the AMIS yet, except for some seed money for administrative costs and pre-project activities. CIDA and EU have been providing funding to GRATIS and the ITTUs, and are likely to be interested in this component when approached. CIDA and other funding agencies would be approached for funding.

(viii) Benefits

II.21. The direct benefits from this component would be: (i) good quality locally manufactured agro-processing machinery available; and (ii) skills and knowledge of local equipment manufacturers improved. This would lead to reduced imports of agricultural machinery and equipment, with related savings in foreign exchange and to improved rural income, mainly through: (a) increased commercial level processing; (b) increased value addition; and (c) reduced post-harvest losses.

II.22. The direct beneficiaries would include:

- GRATIS Foundation, TCC and Suame ITTU, mechanical workshops (machinery and equipment manufacturers) would benefit from capacity strengthening.
- Micro, small and medium-scale manufacturers of agricultural machinery offering support services to commercial agro-processors, especially in the Accra-Tema and Kumasi areas, and expanding nationally through the effective coverage areas of the zonal offices of the national association and the regional ITTUs.
- The Ghana Standards Board and the Ministry of Trade and Industry would benefit from capacity strengthening in the areas of standardization and harmonization of agro-machinery and equipment.
- MOFA-WIAD would receive support in implementing training programmes in the Food Trial and Development Centre for women groups and other interested parties in hygienic and quality food processing, preservation and marketing.
- The target end-user groups are the commercial small and medium-scale agro-processors.

II.23. The indirect beneficiaries would include other stakeholders in the agro-metal industrial sector within the effective catchments areas of the implementing agencies, initially mainly in the Accra-Tema and Kumasi areas, but later expanding nationally through the effective coverage of the zonal offices of the national association and the regional ITTUs. Other beneficiaries would be national support institutions and Non-Governmental Organizations.

Component 2: Supporting Professionally Managed Warehouses at Major Producing And Marketing Centres

(i) Background

II.24. The need for establishing a grains storage system has been discussed in various forms among Government and experts in the industry. Although a project in support of grain storage was initially considered for inclusion in the proposed request for funding under the Million Challenge Programme of the U.S. Government by the Ministry of Finance, it was finally not included. However, the Ministry has indicated that it would support initiatives for implementing an effective grains storage system and that GoG would provide the necessary counterpart funding and seek donor support for this component.

II.25. **Grains Warehousing by The Ghana Food Distribution Corporation (GFDC).** GFDC has 35 000 tonnes of warehousing space, of which 20 000 tonnes in the maize belt of Ashanti and Brong Ahafo Regions. These warehouses used to serve as facilities for drying, cleaning, bagging and storage of mainly maize and other grains. However, in the past few years GFDC has been bankrupt, and none of its facilities is being used for grain storage. The Government has been working on proposals to keep

some of the GFDC facilities for Strategic Food Reserves. An inventory of all warehouses and silos has been conducted and a decision has been made on those that will be used for food security reserve and those that will be divested to the private sector. The Ministry, in the meantime has consented to requests by some private companies to rent some of the warehouses and silos for their use. In addition, some Cocoa warehouses owned by the Produce Buying Company (PBC) are available for use by all private licensed buying agents. Where cocoa is no longer being produced, especially in the transitional belts of Brong-Ahafo and Ashanti, these warehouses can be used by private people operating in the grains market.

II.26. The Warehousing and Inventory Credit (WIC) System. Inventory credit entails the use of stored goods as collateral for loans, and can, therefore, be applied to any durable or storable product. In Ghana, TechnoServe has applied the use of inventory credit for grain marketing, particularly for maize since 1989. The amount of credit provided by the local banks is pegged to a proportion of the current market value of the stored grain, usually between 70 and 80 percent of the prevailing market price. This limits the lender’s risk should the price not rise as anticipated. The inventory credit programme is profitable only when the increase in the value of the stored goods exceeds the costs of storage and the borrowed funds (i.e. interest payments, bank fees, etc.). Since inventory credit is essentially a speculative activity, the implementation of such a programme must be managed carefully, which requires diligent monitoring of stored goods, price fluctuations and market supply trends.

II.27. By 1997, the Agricultural Development Bank (ADB), the prime lender to the agricultural sector was financially supporting inventory credit covering 24 480 tonnes of cotton (5 percent of total production) and 12 650 tonnes maize (2.5 percent of total marketable surplus). ADB has continued to support warehousing trade in cotton and maize at a minimum of those quantities since then.

II.28. The Warehouse Receipts System (WRS). In a classic WRS the warehouse-keeper (collateral manager) issues securities (known as warehouse receipts) certifying that ownership of a given quantity of produce with specific characteristics in storage in their facility. The farmers then individually or via farmer-based groups contract to sell the goods represented by the warehouse receipts. The warehouse receipts coupled with sales contracts can then be used as collateral for loans. This collateral is more secure than the same produce stored and managed by the farmer. Centralized regulated warehouses reduce the risk of wastage. Storage insures that collateralized crops are not used for other purposes. By bulking their produce in large warehouses and consolidating marketing under the management of farmer-based groups, large volume contracts can be sold more easily, enabling farmer-based groups to sell and fulfil international commodities contracts. Banks therefore have greater assurance that collateral will be converted into cash flows. In addition, banks have fewer parties to supervise and so due diligence costs are significantly decreased. A well functioning warehouse receipts programme can develop the urban and rural infrastructure needed to support an efficient credit, distribution and marketing system for both local and export markets. This enables rural communities to derive the benefits from increased participation in global agro-businesses.

II.29. The experience of ADB, maize farmers and traders in almost a decade in the WIC system indicates a strong potential for using the WRS in financing maize and other grain trade, both domestic and exports. However, it is recognized that, in order to exploit this potential, all GFDC grain storage, drying and storage facilities, particularly those located in the maize belt (Ashanti and Brong Ahafo Regions), should be transferred to competent private grain warehouse operators. These operators could then be contracted by Government to store strategic food reserves. In addition, there would be a need for new warehouses in those marketing centres where GFDC and PBC have no significant warehouse facilities.

(ii) *Area*

II.30. The component would locate new warehouses in about 10–20 major marketing centres of the country. Locations would include dedicated grains market in Accra, Takyiman and Kumasi, with capacity for 2 000–5 000 tonnes each, with loading and unloading docks and machinery. Major markets in maize belt that need proper warehousing facilities include Techiman, Ejura, Sekyidumase, Sunyani, Mampong–Ashanti, Abofor–Ashanti, Goaso–BA, Nkoranza and Kintampo.

(iii) *Rationale*

II.31. Grains constitute a major portion of the food basket of Ghanaians. However, they are produced on a seasonal basis and in many places there is only one harvest a year, which is liable to failure. This means that in order to ensure food security for Ghanaians, a sustainable system of grains storage has to be in place. Grains storage therefore occupies a vital place in the food security strategy of Government and has featured as a major component in the Ministry’s Development Strategies and Plans.

II.32. In order to meet immediate cash needs, small-scale farmers must often sell their produce shortly after harvest, when market prices are at their lowest. Without adequate storage facilities and access to loan funds, they are unable to hold their crops for later sale during the “lean season,” when prices are much higher². Consequently, small-scale farmers are unable to maximize their profits, remaining classic “price takers.” Therefore, warehousing, when combined with inventory credit system, provides income and security for the farmer.

II.33. Additional factors which justify the need for grains warehousing include: (i) inadequate transportation at farming communities at harvest time to haul produce to market centres, resulting in the need for immediate storage in the interim; (ii) lack of ready market for produce in the market centres, resulting in a need for storage or warehousing while waiting for sale; and (iii) inadequate agro-processing facilities.

(iv) *Objectives*

II.34. The *development objective* of the component is to contribute to increased farmers income and food security as well as rural employment through reducing post-harvest losses and improving stability of agricultural produce prices. The *specific objective* is to provide appropriate warehousing facilities at major producing and marketing centres in the country, to be managed by licensed warehouse operators and used by product associations under the inventory credit and warehouse receipts system.

(v) *Description*

II.35. **Main outputs:**

- 10–12 refurbished GFDC drying, cleaning and storage facilities for maize and other grains in the maize belt of Ashanti and Brong Ahafo Regions to dry about 50 000 tonnes of grains and store 25 000 tonnes.

² E.g. for maize the lean season price is typically 75–250 percent higher than the price at harvest time.

- Additional 25 000 tonnes of drying and warehousing facilities built in major market centres nationwide by government and donor funds. Key locations and sizes would be:
 - a) Very large dedicated grains market in Accra, (3 000 – 5 000 tonnes capacity) with loading/unloading docks and machinery, and transportation facilities attached.
 - b) Very large warehouses (3 000 – 5 000 tonnes capacity) in other major markets, specifically Techiman and Kumasi.
 - c) Large warehouses (1 000 – 1 500 tonnes capacity) in about 10 markets such as Ejura, Sekyidumase, Sunyani, Mampong (Ashanti), Nkoransa, Kintampo, Goaso–BA and Abofor–Ashanti.
 - d) Medium–size warehouses (300 – 500 tonnes capacity) in selected rural markets.
- All warehouses managed by private entrepreneurs with management teams that have requisite skills in warehouse management and are specialists in grain management. Private sector would have long–term leases, by which they would pay back investment to government.
- A National Warehouses Management Secretariat established to: (i) oversee management of newly established warehouses and the refurbished and privatized GFDC warehousing facilities in close collaboration with the National Association of Warehouse Operators (NAWO); (ii) coordinate maize and other grain producer associations in the maize and grain belt; (iii) organize farmer and trader members to effectively use the warehousing facilities in the major production and marketing centres; (iv) work with financial institutions, grain producers and traders associations, as well as professional warehouse managers employed by the private sector to establish and operate warehouse inventory credit and receipts system at all the warehouses under its control and (v) offer training to warehouse operators and grain producers/ traders associations.
- All warehouses managed by private entrepreneurs with management teams that have requisite skills in warehouse management and are specialists in grain management. Private sector would have long–term leases, by which they would pay back investment to government.

II.36. **Main activities:**

- Refurbish GFDC warehouse storage and drying facilities in 10–12 already identified sites in the maize belt of Ashanti and Brong Ahafo Regions.
- Provide additional warehousing with drying and clearing facilities primarily for maize at major markets in the maize and grains belt.
- Locate new warehouses at 10–20 sites in major marketing centres of the country.
- Provide major markets in maize belt with proper warehousing facilities.
- Attach drying, cleaning and grading, weighing, loading and unloading machinery to both refurbished GFDC sites and new sites.
- Provide transportation facilities (tractor–trailers and trucks), to be attached to the warehouses given to grain traders and farmers for transporting grains from farms or farming areas to warehouses, under leasing or rental arrangements.

- For standardization in construction and operations, design in expandable modules of 1 000– and 500–tonnes capacity warehousing, storage, drying, cleaning, bagging, loading, unloading, transportation and management.
- Facilitate private entrepreneurs to manage warehouses, using a management team that has requisite skills in warehouse management and specialty in grain management.
- Train local staff in warehouse management, operating inventory credit and receipts system, which would also involve the finance community.
- Support warehousing with inventory credit and receipts system, including collateral managers.
- Establish a secretariat with a national office located at Kumasi in the maize and grain belt, with a core staff and vehicles to oversee effective operations of the warehouses and the inventory credit and warehouse receipt systems by farmers and traders associations.

(vi) Indicative Costs

II.37. Total component cost over the five-year implementation period is estimated at US\$12.4m. Details of estimated costs by main activity, broken down by project year and local/foreign cost are presented in Tables 2a and 2b in Annex 1).

(vii) Proposed Sources of Financing

II.38. The CFC of the UN and the NRI of the UK have carried out studies, workshops and other initiatives relating to establishing warehousing for grains in Ghana, supported with warehouse inventory credit and receipts systems. As these organisations are not in a position to fund this project component, other partners would be approached by GoG for funding.

II.39. The private sector, to be involved in managing the refurbished and new warehouses that would be constructed with donor funds, would be expected to contribute some equity funds in the management and pay-back of loans and grants to Government. The central government is expected to contribute to such an important programme. District Assemblies (DAs) in the beneficiary towns and market centres, would provide support to the programmes by providing land and support, through the Department of Cooperatives (DOC) and Agricultural Extension staff, in group formation and training for crop producer associations.

(viii) Benefits

II.40. The component would contribute to increased rural incomes and increased food security for the nation. Specific benefits would be: (i) reduced post-harvest losses; (ii) improvement in food quality of grains; (iii) increased stability of grain prices throughout the year; (iv) employment generation; (v) the creation of market and service linkages; and (vi) improved farmer group dynamics and enhanced leadership capacity among participating farmers. Moreover, it is anticipated that other farmers, seeing the benefits accruing to participants in the inventory credit programmes, would be independently adopting the practice of inter-seasonal storage.

II.41. Experience in other countries such as Zambia has shown that the existence of commercial large-scale grain sector is a key factor for success. Therefore, the association of commercial grain traders would be included to lead the effort in establishing the WRS.

Component 3: Supporting Appropriate Packaging and Cold Chain Technology, Facilities and Supporting Farmers, Traders and Processors for Commercialization

(i) Background

II.42. This component was designed in collaboration with the design team comprising the MOFA designates from AESD–Post Harvest Unit, MOFA–WIAD and executives of the Institute of Packaging, Ghana. The involvement of industry experts such as those from IOPG provided some direction at this concept phase. The pre–project stage would involve commercial and market feasibility studies of the various technology options, stakeholder workshops involving the private sector for discussion of these options, selection of feasible options by the private sector, and support to private sector investors to successfully implement selected options.

II.43. Staples such as plantains root and tubers, cereals, fruits and vegetables as well as fish and meat constitute the major food items widely consumed in Ghana. The bulk of these staples are produced by rural farmers with very low incomes and poor standards of living. There has been a lot of emphasis on increasing food production and over the years this has yielded significant results. At the same time, there has been little attention to post harvest handling, hence a lot of farm produce still goes to waste leading to loss of value and revenue to the farmer.

II.44. Very few of the local staples are processed into value added products and this coupled with poor packaging and handling from the farm gates to the markets result in significant post harvest losses. Most farm produce in Ghana is transported in bulk with a lot of waste that the consumer does not need. For instance, in the process of moving the plantain from the farm to the consumer whole bunches of plantain are carried on the head to the road side, packed in vehicles in bulk without any protective containers, and discharged and displayed on the floor at the markets. Such fresh food loss occurs as a result of poor handling, distribution and packaging, especially during the major season. There is a need to introduce new commercially feasible technologies for handling, distribution, packaging and processing, especially for locally marketed agricultural produce and products.

II.45. Fresh farm produce in local markets is often placed on the ground usually under very dirty and unsanitary conditions, with the risk of transmission of disease as the product moves from one area to another. With the increase in urbanisation and the increase in the middle–to–high income class that demands hygienic quality well–packaged food produce as may be offered in supermarkets and neighbourhood stores, there is a growing demand for fresh and packaged food in these outlets. This component would not only develop commercially viable technologies to satisfy this growing demand, but also stimulate an increase in demand through advertising and promotion.

II.46. Promotion would create awareness of the need to purchase these improved food products for better health, longer lasting use of fresh produce and more convenience. An example of this is the increasing offering of hygienically–packaged beef in food outlets initially introduced by the Accra Abattoir, supported with promotion to create awareness among the public about the need to consume such products for safety. Other private butcheries and meat shops are springing up throughout Accra and the major cities, and the middle–to high income class is increasingly purchasing from these

outlets. Such outlets could be included in the stakeholders conferences to review commercially feasible options, since they could easily adopt and include them in their outlets for sale.

(ii) *Area*

II.47. The component would be implemented nationwide, focussing on places where agricultural produce such as maize, roots and tubers, fruits, vegetables, fish and meat are produced on a large scale.

(iii) *Rationale*

II.48. It is estimated that nearly 30 percent of Ghana’s crop harvest is lost through spoilage. This is a big loss to farmers and waste of natural resources. If a means of preservation, storage, processing and good handling can be found, there is an enormous potential for contributing to the economic development of the country. Therefore, there is a need to give more attention to processing and packaging of local agricultural produce as a means of adding value, preventing post harvest loss and enhancing marketability on the local and export markets. This would primarily be the domain of commercial agribusiness enterprises. Project focus would be on produce and products marketed locally, since export crops are being covered in ongoing and proposed programmes (see Annex 3). Storage and packing of locally marketed crops is a virgin and more difficult area to deal with. It requires assessment of the market and economic feasibility, prior to development. However, it is a critical area of Ghana’s post-harvest systems that needs to be developed, which is currently neglected because of its difficulty.

(iv) *Objectives*

II.49. The *development objective* of the component is to contribute to increased income of rural dwellers by minimizing post harvest losses and adding value to farm produce. This is to be achieved through developing appropriate handling, processing, packaging and cold chain facilities for local staple crops such as plantain, cassava, yam and vegetables, as well as fish and meat. The *specific objectives* of the component are:

- To improve the handling, storage and marketing of cereal and cassava based dried products (flours and grits) through packaging and bulk processing.
- To improve the handling, storage and marketing of fresh plantain, tomatoes and other vegetables through packaging and restricted ripening methods, based on market analysis.
- To establish a system for improving the handling, storage and marketing of traditional fruits (e.g. oranges, mangoes and pineapples) through small-scale processing and packaging, based on market analysis.
- To promote ready-to-cook peeled and sliced fresh yam or plantain for using appropriate packaging and cooling facilities in the distribution chain, based on market analysis.
- To establish a system for handling perishable produce (vegetables) from farm to urban centres using cold chain facilities, appropriate packaging, storage and transportation, based on market analysis.

- To establish a system to adequately package, store and distribute fresh fish and meat using cold chain handling systems, based on market analysis.
- To train traders, processors, packagers, and cool chain operators in packaging and cold chain technology. Training would vary based on the target group.

(v) *Description*

II.50. **Main outputs:**

- Privately managed secretariat with national office located in Accra, with an Executive Secretary and a core staff, with equipment and vehicles to effectively manage the programme.
- Field centres in regional capitals, with privately managed offices and staff that report to the national secretariat in the head office in Accra. The regional staff would work with farmers, traders and processors.
- A packaging logistics centre, with equipment, supplies and requirements for demonstrating and promoting commercially feasible technologies to the private sector for investment.
- Processing and packing plants, with equipment, supplies and requirement for demonstrating commercial feasibility and promoting this business to investors in the private sector.
- Packing and pre-cooling facilities for perishable vegetables, meats and fish with requirement for demonstrating commercial viability and promoting this business to investors in the private sector.
- Training in packaging, processing and cold chain management offered to traders, processors and packers. Training programmes would be specific for each of the above target groups. Technical Assistance for IOPG to support the secretariat in establishment, maintenance, operations and demonstration of commercial viability of various technologies to the private sector for investment.
- Promotion of new technologies among associations of farmers, traders, processors, packers. Promotion would be designed to be specific for each of the target groups identified.
- Funds provided in the programme to financial institutions to offer credit to beneficiaries (traders, processors, packers) to purchase appropriate machinery, equipment and supplies.

II.51. The component would comprise four **sub-components** as follows:

- *Processing, handling and packaging:* The sub-component would develop cost effective, financially feasible and appropriate processing, packaging and food handling systems through a variety of techniques including: (a) retardation of ripening of fruits (tomatoes, plantains); (b) processing of staples into convenient value added products; and (c) eliminating the current practice of placing fresh staples on the floor in the markets by using platforms and appropriate packaging; and (d) other hygienic processing and packing of the various product types identified within the areas covered under the project.

- *Cold Chain:* The sub-component would set up facilities for handling fresh produce (vegetables) with cooling facilities from the farm gate to the urban markets. This would include packaging facilities that start the cold chain, followed by cooling vans for transportation to the consumption centres. Pilot programmes would be implemented to develop technically and financially feasible options, which would be introduced to private entrepreneurs through stakeholder workshops. Assistance would be provided to investors under the project to start and operate feasible options.
- *Capacity building:* The sub-component would support: (a) target group specific training of food commodity handlers, market women processors and exporters in post harvest handling, packaging, cooling and value addition techniques; and (b) execution of pilot programmes to test the effectiveness of different processing, packaging, cooling, and general product handling techniques for the various produce.
- *Business management:* The sub-component would strengthen the business management skills of small and medium-scale enterprises that would be involved in the all aspects of post handling and processing, packaging and distribution of food products.

II.52. Main activities:

- Establish a secretariat with a National Executive Secretary to be hired from the private sector, with office facilities and staff to support activities. The secretariat would report to a National Steering Committee that already exists for private agribusiness development and promotion, chaired by MOFA and other stakeholders. This would be to avoid multiplication of Steering Committees overseeing agricultural development.
- Establish field centres throughout the country in the regions to implement the programme in the regions, while reporting to the national secretariat. Implementation would have field staff work with farmers, food crop traders and processors in planning, design and execution.
- Carry out produce-specific feasibility studies and market assessments for each of the technologies to be promoted by the component.
- Promote the development of peeled, sliced and packaged yam, plantain, cassava for prolonged storage, by demonstrating commercial feasibility to private investors.
- Promote the establishment of privately owned small-scale processing and packing plant, by demonstrating commercial feasibility to private investors.
- Develop and demonstrate to private investors a business of operating a cooling van for the distribution of packaged fresh produce (fish, meat, plantain, vegetables).
- Promote delayed ripening technologies for improved shelf-life of plantain to private investors.
- Set up a packaging and processing development centre to service small and medium-scale enterprises.
- Implement the rural transportation strategy (with the physical investment activities re-oriented to local/commune level transport infrastructure only, including cooling van).

- Establish a monitoring and evaluation system to support the various units established under the component.
- Continuing the introduction of improved technologies, through training, demonstrations and visits to pilot processing plant.
- Provide funds in the programme to financial institutions to offer credit to beneficiaries (traders, processors, packers) to purchase appropriate machinery, equipment and supplies.

(vi) Indicative Costs

II.53. Total component cost over the five-year implementation period is estimated at US\$10.95m. Details of costs estimates by main activity, broken down by project year and local/foreign cost are presented in Tables 3a and 3b in Annex 1).

(vii) Proposed Sources of Financing

II.54. The GoG would seek donor support for this component, however, so far no donor agency is known to have expressed interest in funding this component. Based on general experience of the past and in line with the expected distribution of overall project costs among stakeholders, it is assumed that GoG (both central and local) would contribute about 20 percent of the total funding required, donors 60 percent and the private sector and beneficiaries around 10 percent each.

(viii) Benefits

II.55. The main benefits anticipated from the component would be: (i) reduction of post-harvest losses, quality improvement and value addition of farm produce, resulting in improved incomes for small farmers and increased potential for export; (ii) enhanced income-generating activities in the communities; and (iii) improved food safety as consumers will enjoy farm products well packaged under hygienic conditions and free from contamination.

Component 4: Promoting the Use of Measures and Weights for Trading in Agricultural Commodities in Ghana

(i) Background

I.1. **Past Efforts.** The non-use of standard weights and measures in agricultural trade has always been of concern to MOFA, since it introduces marketing inefficiencies in trading activities. The Ghana Standard Board (GSB) and related agencies, especially MOTI, had made several attempts in the past to introduce standardization in Ghana’s informal trade sector. To-date, these attempts have largely been to no avail. The primary reason for failure has been the lack of adequate funding for a comprehensive programme that would deal with the major issues and fundamental problems identified below.

I.2. **Current Efforts and Major Issues.** MOFA, in collaboration with GSB, is promoting the use of standards weights and measures in agricultural trade in Ghana. Under the AgSSIP programme a thorough literature review was performed relating to various activities in the past concerning the introduction of standards weights and measures in the country. The review identified the following

three fundamental problems with the introduction of standard weights and measures: (i) availability of scales; (ii) price affordability; and (iii) mass education.

I.3. The major problems identified with the availability of scales were the inability of local industries to manufacture durable and efficient scales in the right quantities for use by market women. For price affordability, the key challenge was the rapid and progressive depreciation of the cedi and the resultant rise in prices of imported scales. With regard to mass education, GSB has had elaborate mass education programme plans in collaboration with Information Services Department, but has not been able to secure enough funding to support and make this effective. Mass education of the stakeholders (traders, consumers and farmers) to establish and maintain the practice of using weights and measures in agricultural trade is the key to success of the programme. Once this demand for weights and measures has been established, traders would then be willing to purchase the scales and measuring units provided at affordable prices.

II.56. The present component is based on past GSB proposals and strategies that have not yet been implemented as well as on recent consultations with MOFA and GSB, following the identification of additional needs. MOFA, GSB, together with foreign donors and local trade associations, have begun a **pilot programme** that covers the following:

- Training traders from selected markets nationwide in the use of scales for trade;
- Providing scales for free to traders in selected markets nationwide; and
- Educating the public about benefits of weighing produce purchase, and encouraging them to insist on having produce weighed.

II.57. About US\$150 000 has been spent on the pilot programme so far, primarily funded by CIDA. USAID-IFDC has spent about US\$10 000 so far on the pilot programme. Additional funding would be needed for the full implementation of this proposal, which is fully supported by MOFA-SRID and GSB of MOTI/PSI.

II.58. **GSB and enforcement of regulation.** In recognition of the importance of weights and measures, the Government of Ghana enacted a decree entitled “Measures and Weights Decree, NRC 326, 1975”. The purpose of this decree was to create the legal framework within which trade in Ghana will be by standard weights and measures, and requiring that offenders be effectively prosecuted. GSB, being the primary institution for implementation of this law has in the past decade (i.e. since 1995/96), prepared proposals for financial support to implement a comprehensive process of introducing standard weights and measures in all aspects of trading, including agricultural trade in Ghana. To-date, no funding has been made available for these proposals.

II.59. **Locally manufactured scales.** As at now, no local dealer has been registered as manufacturer of scales, although some dealers and individuals have been fabricating scales and weighing scales used by foodstuff traders are usually manufactured locally. It is generally accepted that locally manufactured scales can be as durable as imported ones and can be more readily serviced, as their parts are available locally. These scales are also considered to be cheaper than the imported ones, although a meaningful comparison of prices is difficult, given the differences in design and capacity of imported and locally manufactured scales.

II.60. **Imported scales.** Figures on quantities imported per year are not available at the GSB. The larger scales of weight 50–100 kg are generally used by big firms like COCOBOD, CEPS, GPHA,

while the smaller ones (5–50kg) are used by meat and frozen fish sellers. Out of the 18 importers of weighing scales, only 8 are currently in business.

II.61. **Regulations for importation and quality control of the industry.** The quality/durability of imported scales are ensured through a system of Pattern Approval Certification. The GSB has instituted a system of ensuring that scales used for trading/commercial transactions maintain their accuracies through Verification/Inspection Programme organized twice in each year in all GSB Regional Offices.

(ii) Area

II.62. The introduction of standard weights and measures in agricultural trade would be nationwide. The programme would start with a pilot initiative in selected markets in Accra, Kumasi and Tamale. The expansion programme would be extended to more markets in these three major towns, as well as other major markets in other towns nationwide.

(iii) Rationale

II.63. There are dozens of commercially traded agricultural goods in Ghana including items of cereals, roots and tubers, pulses, fats and oils, fish and meat. Of this list, standard weights and measures are used to any appreciable extent (usually in urban markets) for only meat and fresh fish. The bulk of agricultural produce is sold without the use of these standards. Measures used in place of standardized weights and measures include different sizes of “Olonka” (American Tin) for cereal trade, different sizes of roots and tubers, and dried fish counted in fixed numbers (e.g. in 100s or 50s) different sizes of bunches of banana, plantain etc. The consequences of such varied and non-standardized measuring include unfair trade (especially cheating of farmers and fishermen) and the inability to trade without being present in the market. The result is the higher than necessary cost of marketing.

II.64. In Ghana about 90 percent of traders in agricultural commodities do not use grades nor standard weights and measures. Compared with the confusion on the local food-marketing front, produce coming from canning factories, have specific weights. The Ghanaian consumer therefore tends to be more satisfied with canned food items than with food items sold in units based on the various non-standardized measures used by traders.

II.65. The need to standardize weights and measures in agricultural trade is borne out of the following facts:

- Weights and measures provide a scientific means of ensuring a constant quantity and quality of a product, which allows transactions to be made without the buyer and seller being present at the same point and thereby contribute to reducing the time and cost of transaction.
- The application of standard weights and measures brings about uniformity and convenience in transaction, thereby increases pricing efficiency, improves transparency in pricing and allows for a more effective regulation of trade for the benefit of all stakeholders.

(iv) *Objectives*

II.66. The main objectives of this component are:

- To develop a programme of ensuring that standard weights and measures are used throughout the country for trading that will bring about fair trade;
- To establish a secretariat at MOFA to coordinate a national programme for introducing and maintaining a system for the use of standard weights and measures in Ghana; and
- To strengthen the capability of GSB to enforce the use of standard weights and measures in agricultural trade by market women, manufacturers etc.

II.67. The proposed programme is not about developing grades and standards. The grades and standards that exist, no matter how basic, are considered as being adequate. The problem is getting them used widely in regular trade in agricultural produce. Local manufacture of scales in the long-term would solve the problem of affordability, though imported good quality and reasonably priced ones from China, would be used in the initial stages.

(v) *Description*

II.68. **Main outputs:**

- A Secretariat established at MOFA/ SRID for the Programme.
- Pilot programme, including follow-up evaluation visits and evaluation workshop completed.
- Equipment purchased and installed at GRATIS (Tema) for prototype and commercial scale development.
- Prototype and commercial scales developed by GRATIS (Tema) and TCC/ Suame ITTU (Kumasi).
- Selected local artisans trained in scale manufacture.
- Laboratory established and operated at GSB for testing and calibration.
- Team established at GSB to enforce use of measures and weights in trading.

II.69. **Main activities:**

- Establish a Secretariat at MOFA/SRID for the Programme, which would initiate, coordinate, monitor and evaluate implementation, with various stakeholders.
- Implement a pilot programme consisting of: (i) sensitizing and recruiting market traders in pilot markets; (ii) purchasing and distributing scales and packaging materials to traders; (iii) promoting the programme in the media, targeting the farmers from whom traders purchase, the traders and their customers; (iv) training selected traders; and (v) operating the programme for a period of six months.
- Organize a workshop for stakeholders to evaluate the pilot programme, with recommendations for the expansion phase programme.

- Purchase and install equipment for scale manufacture at GRATIS (Tema).
- Support prototype and commercial scale development by GRATIS (Tema) and TCC/Suame ITTU (Kumasi), in collaboration with GSB and MOFA.
- Support training of selected local manufacturers in scale manufacture, with assistance in commercial sales.
- Establish a team at GSB to enforce the use of measures and weights in agricultural trading.

(vi) Indicative Costs

II.70. Total component cost over the five-year implementation period is estimated at US\$6.95m. Details of costs by main activity, broken down by project year and local/foreign cost are presented in Tables 4a and 4b in Annex 1).

(vii) Proposed Sources of Financing

II.71. The Canadian Institution for Development Assistance (CIDA) has showed interest and committed funds to support initial initiatives on this subject matter (up to US\$150 000 so far of their funds have been spent on the Pilot Programme). CIDA would, therefore, be approached to fund this programme, probably as part of a consortium of donors, since other foreign donors have also showed interest. CIDA may consider funding it under the total assistance of US\$60m proposed for the GoG in the next 3–5 years.

II.72. USAID–IFDC has spent about US\$10,000 so far on the pilot programme, which has shown that people are interested in using the scales in marketing. The USAID–IFAD programme is for 4 years (2005–08), and they would be interested in funding part of the expanded nationwide programme proposed in the three remaining years.

(viii) Benefits

II.73. The main benefits from this component would be: (i) reduced transactions costs; (ii) increased pricing efficiency; (iii) improved transparency in pricing; and (iv) a more effective regulation of trade for the benefit of all stakeholders.

III. INDICATIVE PROJECT COSTS

III.1. Total project cost over the five-year implementation period is estimated at US\$43.0m. A breakdown by component and local/foreign cost is presented in the table below. Details of estimated costs for each of the various components are presented in Annex 1.

III.2. The simplified assumption, based on general experience of the past, is that GoG (both central and local) would contribute at least 20 percent of the total funding required, around 60 percent would come from donors and financing institutions, and 10 percent each from the private sector and the beneficiaries.

Indicative Project Costs by Component and Local/Foreign Cost						
Component	Local cost		Foreign cost		Total cost	
	US\$'000	%	US\$'000	%	US\$'000	%
1) Support to s/m-scale manufacturers to manufacture agro-processing machinery	6,800	53.5	5,900	46.5	12,700	29.5
2) Support to professionally managed warehouses	6,795	54.8	5,605	45.2	12,400	28.8
3) Support to appropriate packaging and cold chain technology	8,150	74.4	2,800	25.6	10,950	25.5
4) Promotion of the use of measures and weights	4,800	69.1	2,150	30.9	6,950	16.2
Total	26,545	61.7	16,455	38.3	43,000	100.0

IV. IMPLEMENTATION ARRANGEMENTS

IV.1. **Overall Project Management.** Because of the disparate nature of the project components, different secretariats would be required for each component. The activities of these secretariats would need to be coordinated. Rather than setting up new steering committees to whom these secretariats would report, it is proposed that coordination of this project be integrated within existing institutional framework (steering committees in agriculture, agro-industry, agribusiness etc.). This would ensure that the various components of this project would build on and complement existing initiatives in the sub-sector.

IV.2. The primary ministries responsible for this project are MOFA, MOTI/PSI and PSM.

- MOFA is the ministry that would be responsible for overall project implementation, including planning, procurement and coordination.
- MOTI/PSI has key roles to play through the Ghana Standards Board.
- PSM would be responsible for the private sector participation.

IV.3. The responsibilities of other MDAs which would play a role in project implementation are:

- The Ministry of Finance and Economic Planning (MFEP) would be responsible for mobilizing the necessary financial and other resources needed to carry out the project.
- The MLGRD through its District Assemblies in the project areas would provide needed community contacts for project implementation teams. In addition the District Assemblies would contribute financially toward project implementation.
- The Ministry of Regional Cooperation and NEPAD would be represented on the Steering Committee, as it might be necessary to consider the effect of project development on neighbouring states.

VII.4 **Implementation arrangements specific to each of the components** are as follow:

- **Component 1.** A National Association of Agricultural Equipment Manufacturers (NAGEM) would be established, with a professionally staffed secretariat that would offer critical support services and funds to the members. Zonal offices would be set up in Kumasi and Tamale for the middle section and the northern half of the country. The GSB would set up a programme secretariat in Accra, which would be providing services and support to the industry nationwide, working closely with and through industry associations to reach members in the zones and regions. GSB would work with GRATIS,

TCC and Suame ITTU to educate artisans concerning regulations on quality standards and the need to follow them in their operations. MOFA–WIAD would hire new professional staff and contracted consultants when needed, as well as special equipment to effectively run training programmes in the Food Trial and Development Centre for women groups in hygienic and quality food processing, preservation and marketing.

- **Component 2.** A National Warehouses Management Secretariat would be established in Kumasi in the maize and grain, with a core staff and vehicles to oversee effective operations of the warehouses, inventory credit and warehouse receipt systems by farmers and traders associations. All warehouses would be managed by private entrepreneurs with management teams that have requisite skills in warehouse management and are specialists in grain management. The Secretariat staff would be overseeing operations of warehouses by private warehouse managers in close collaboration with the National Association of Warehouse Operators (NAWO).
- **Component 3.** Technical responsibilities would be devolved to the Institute of Packaging Ghana for the planning, packaging and processing design, supervision and implementation of the component. Privately managed field centres would be established in the regional capitals, and the staff would report to the National Secretariat in Accra. Farmers, food crop traders and processors would play an important part in the project by becoming involved in planning, design and execution of the schemes. Consultative planning would be the key tool in ensuring the full participation of the stakeholders.
- **Component 4.** A secretariat would be established at MOFA/SRID for the Programme, which would initiate, coordinate, monitor and evaluate implementation, with various stakeholders. A project team would also be set up to provide the technical inputs and to supervise the enforcement of the use of measures and weights in agricultural trading. It would be given the logistics, equipment and funding needed for effective operations.

V. TECHNICAL ASSISTANCE REQUIREMENTS

V.1. **Component 1:**

- MOFA and MOTI/PSI, the ministries involved in the implementation, would require internationally and nationally recruited consultants to assist in final project design, initiation, monitoring and evaluation.
- Furthermore, technical assistance (TA) would be needed in the area of national recruitment and orientation of professional staff for the various secretariats to be set up for the different programmes.

V.2. **Component 2:**

- National or international TA would be needed to provide policy guidance and prepare detailed feasibility studies and design the component.
- National or international TA would be needed in the areas of warehouse refurbishment, construction, drying equipment installation and operations, general warehouse operations, grain storage specialists, forklift and truck logistics to establish and assist in operations.

- Training to be offered to local staff in warehouse management, operating inventory credit and receipts system, which would also involve the finance community.
- Training producer and trader association and members in effective use of warehousing system for maximum benefit
- Professional staff at the secretariat office would benefit from practical exposure through seminars, international tours etc., to see and learn from successive implementation of similar programmes in other developing countries.

V.3. **Component 3:**

- National or international TA would be needed to conduct market analysis and economic feasibility studies for each of the technologies to be implemented under the component.
- Long-term TA in the fields of: (a) food processing business management; (b) packaging technology; (c) post harvest technology; and (d) cold chain technology.
- Short-term TA including: (a) extension specialist in processing and storage; and (b) training specialist.

V.4. **Component 4:**

- National or international TA to prepare detailed feasibility studies and design the component.
- Professional staff at the secretariat office and executive of the trader associations would benefit from practical exposure through seminars, study tours etc., to learn from successive implementation of similar programmes in other developing countries.
- GRATIS/KNUST would provide the technical assistance, and be supported with the necessary equipment for local manufacture of prototype scales.
- Training of manufacturers by GRATIS/KNUST in the manufacture of commercial weighing scales they have developed.

VI. ISSUES AND PROPOSED ACTIONS

VI.1. ***Diversity in donor funding.*** It is likely that different donors might commit to support specific components. Each donor may have its own requirements and conditions for funding, necessitating variation in design and operations by the GoG and other project stakeholders in participation. Efforts would be made in the detailed project design to get agreement among all stakeholders about implementation arrangements and mechanisms that will allow for efficient and smooth operations.

VI.2. ***Enforcement of law on weights and measures.*** GSB indicated that it did not have enough inspectors to enforce the use of standards in trading. There is, therefore, the need for MOTI to establish a Trading Standards Unit and staff it with a core of inspectors to supplement the staff of GSB in the enforcement of laws.

VI.3. ***Recommendation for a National Committee.*** It is recommended that a National Committee be set up to oversee the introduction of standards weights and measures and to draw up a workable plan of action. A small working group, led by MOFA, is to gather materials that will constitute part of the working documents for the National Committee.

VI.4. ***Warehouse Receipts System.*** Specific issues which need to be addressed in order to successfully implement the Warehouse Receipts System under Component 2 include:

- ***Supportive policies.*** For delayed commodity (grain) sale to be attractive, seasonal price differences should equate or more than offset the additional cost of storage (including the financing cost involved.). This would usually not be the case if government intervenes to maintain stable and seasonally subsidized prices. Government commitment to developing efficient competitive markets is essential for private sector confidence in investing in required infrastructure.
- ***Efficient and credible warehousing industry.*** Inadequate or low quality storage infrastructure makes warehousing unreliable in maintaining the value of the crop and, therefore, its utility as collateral. The cost of storage also increases where warehouses are thinly spread in the grain-producing areas, thus making transportation costs excessively high for distant producers. In the Ghanaian situation, modern grain storage facilities strategically located in the grain surplus-producing areas is concentrated in the hands of GFDC, with total storage capacity of 21 000 tonnes located in the “maize belt” (Ashanti and Brong Ahafo Regions). The GFDC is, however, under-performing and virtually bankrupt and it is critical to the success of this project that these facilities are efficiently operated by a first rate, financially sound company that is also capable of investing in capacity expansion.
- ***Grain quality and grades standards.*** The existence of appropriate quality standards and grades facilitates standardization of stored commodities and allows commingling, which tends to reduce per unit storage costs. These standards also facilitate trade by description rather than physical sampling thus reducing the cost of long distance (cross-border) trade. There is, therefore, the need for Government and the private sector to promote adoption of existing quality standards and grades. The proposed programme is not about developing grades and standards. The grades and standards that exist, no matter how basic, should be adequate and do not pose a problem. The problem is getting them used widely in regular trading of agricultural produce.
- ***Adequate licensing and monitoring system.*** Government agencies such as GSB and MOFA-PPRS would be involved in licensing warehouse and collateral managers, to ensure that they are well qualified. The regulatory organizations would also need to regularly monitor the system to ensure that standards set are maintained.
- ***Appropriate legal environment.*** The proper laws and regulations would have to be set, enforced and monitored regularly, to ensure that all participants in this business have their interests and investments well protected.

VII. POSSIBLE RISKS

VII.1. **Policy framework.** Trade policies pursued by Government could jeopardize efforts for local manufacture of agricultural implements, equipment, processing and packaging technologies etc., if inputs required may need to be imported and import tariffs are too high, making the proposed business commercially not feasible.

VII.2. **Legal framework.** For the various components proposed the legal framework that exists must be supportive of the proposed business activities. For example, in the programme to locally manufacture agro-processing machinery with food-grade raw materials (stainless steel), laws must exist or be made to require such quality materials and enforcement agencies such as GSB must have the support to enforce the laws.

VII.3. **Commercial feasibility.** Commercial feasibility is critical for successful implementation of the proposals in the various components. If the technologies are not packaged in a way that agro-processors and agribusinesses would make a profit from using them in their business, the project components are at risk of failing.