

## **Business model for promotion of metal silo**

### **Private and Public Cooperation Model**

#### **Introduction /summary of the private and public cooperation model**

Cooperation between public and private organization is the most promising way to share the task of introducing the metal silo and other Postharvest management to farmers in rural areas since promotion at the beginning is cost relevant where no private business will invest as long as the demand is not at view. It is the task of public institution to advise farmer and create awareness.

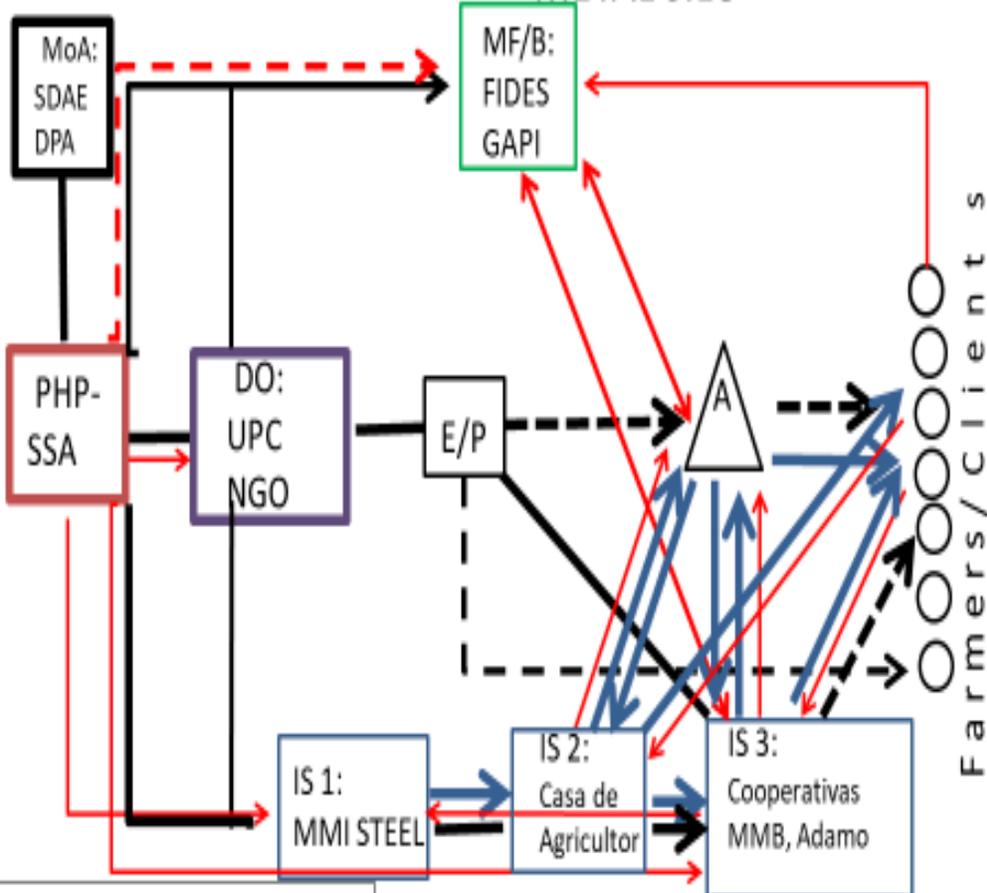
In this model the promotion will be essentially done by Local actors like NGO's, cooperatives, Agrodealers, regional distributors, extension services (Ministry of Agriculture/SDAE), farmer unions (UPC Nampula and Cabo Delgado), etc. The project will empower these organizations.

The project trains extension officers and sales agents from these organizations with the necessary knowledge to train farmers on Postharvest issue and provide them with didactical material. The project also identifies and trains artisans and master trainer in the different villages to start production of the metal silos and quality control system, respectively. An artisan can cover an area of a radio from 15-25km. The provision of the promotional and educational material is a shared task between the actors in the supply chain. Embedded services is key approach for sustainable promotion of PHM technologies. **The Cooperatives, local agro-input suppliers and regional distributors** are the key actors of the business model and the owners of the business. The project will facilitate the establishment of the sales agreement with the artisan and the farmers. That includes also the financial facility with a credit organization or by it's own. In a first stage the project will establish an agreement with a Master Trainer to do the quality monitoring of the promoted technology (metal silo) and at later stage the technology providers will subcontract the Master Trainer for quality control. The project will also train the sale agents in quality control with specific checklist parameters of quality. The project established some agreement with input supplier such as Metal sheet provider, Hardware stores (tools and materials for artisans) and input distributors (Agrochemicals and storage implements, etc.) to facilitate the availability of these inputs to a reasonable price and co-finance some activities for the promotion. In some cases the project also advocates on the policy dialogue for accessible prices for inputs and Postharvest management in terms of Food security with local government.

After the set-up the project will step by step withdraw from the scenario and the Local organizations with the artisans will do their business.

# Business Model 1 : Privat – Public cooperation

## METAL SILO



### Legend:

- Prom./Sales
- Agreement
- Fluxo financeiro
- Input Supply
- Financial guaranties

### Legend:

- PHP-SSA: Project
- DO: Development Organizations (ONG)
- E/P: Extension / Promotion
- IS: Input Supplier
- A: Artisan
- MF/B: Microfinance / Bank
- MoA: Min of Agriculture

## Actors involved and responsibilities

Actor	Category	Role / task description
Project PHM-SSA	Facilitator / market linkages	<p><b>i) PHM-SSA Project</b></p> <p>The project follows the market systems development (MSD) approach that strives to induce systemic changes in market system at scale and in a sustainable manner. The main role of the project will be facilitating linkages and negotiation processes between market actors, namely importers of inputs, national distributors, local agro-dealers, artisans and farmer groups, and supporting these actors in promoting the PHM technologies through dissemination material, media and public awareness work.</p> <p>During phase I, the project intervened in two selected zones of Mozambique where important food crops (grains and pulses) are produced by smallholders in sufficient quantities to store some of the produce for home consumption and/or sale and where PHL is perceived as a major constraint for increased storage of produce. The project tested and adapted harvesting, drying, threshing and storage practices and technologies for maize and cowpea by on-farm trials with support from research institutes of Mozambique (IIAM). It analyzed input value chains for new PHM technologies.</p> <p>The project will place a main emphasis on linkage for improved access to rural finance, further validation of business models, and market linkages in grains/pulses value chains as a main driver for investment in PHM.</p> <p>Based on the results of on-farm research of improved PHM technologies, assessments of cost-benefit and socio-cultural perception and acceptance of PHM options, and first experience with business models for new PHM technologies, the project developed and validated a wealth of material and tools for PHM documentation, training, dissemination and learning (manuals, factsheets, videos, online tools etc.) and started their dissemination. In this business model a key focus will be on disseminating these contents and tools to increase awareness and investment on PHM.</p> <p>Initially the project trained 18 artisans including 2 master trainers in Cabo Delgado and Nampula Province and the large number is concentrated in Chiúre and Mecuburi. These artisans established a contract with a Cooperative of agribusiness and over 500 silos were produced and marketed largely to small holder farmers. As starting, the input supplier marketed the metal silos under 3 schemes: (1) in kind selling; (2) installment payment; (3) single payment. The pre-requisites were that the farmers should participate in trainings (how to use / benefit from the silo), that they use the silos during the year as well as demonstrate and promote with neighbors. Local authorities were engaged to be part of these contractual arrangements with the farmers to add official weight to the matter.</p> <p>The business model will be owned by input suppliers (national distributors, local agrodealers, cooperatives and artisans) as key actors and driving force.</p> <p>The current proposed business model will be centered in:</p>
Ministry of Agriculture (SDAE)	Rural Extension Services (Trains and advises farmers / market linkages)	
UPC	Farmer's Union Rural Extension Services (Train and advise farmers / market linkages))	
MMI Steel	Metal Sheet Producer (provide good quality metal sheets and co-finance promotional activities)	
COOSEN	Cooperatives / local agro-input supplier; Leader of the business model (invest on production and distribution/ main outlet, promotional activities)	
Local Cooperatives	Cooperatives / local agro-input supplier; (invest on seed production, silo marketing and distribution, Sales agents)	

Artisans	Service providers (produce and deliver metal silos)	<p><b>ii) National Distributor (Casa do Agricultor)</b></p> <p>The national distributor is the key actors and the owner of the business. Casa do Agricultor is the largest agro-industry retail network in Mozambique. It is a subsidiary of TECAP SA, a company with about 30 years of experience serving agriculture in Mozambique. It has presence in the provinces of Maputo, Manica, Tete and Nampula and intends to continue to establish networks in other areas. Casa do Agricultor is a project which expands activities of TECAP, which offers complete packages for the agriculture and livestock market with technical advice and personalized service. The main products supplied are seeds, fertilizers, agrochemicals, irrigation solutions, tools and agricultural mechanization, veterinary products, garden equipment and PHM technologies, all found in the farmer's home. In addition, it focuses on the training and provision of technical assistance services to farmers and agro-dealers.</p> <p>The project will establish an agreement with Casa do Agricultor to promote and market PHM technologies greatly in the north of Mozambique (Cabo Delgado and Nampula), and undertake trainings to the staff of the cooperatives in terms of use and handling of metal silos and basic quality related issue to ensure proper quality control (embedded quality control). The project will facilitate market linkages with market actors along the input supply chain. Initially, the project will assist the first contact between Casa do Agricultor and MMI Steel based (metal sheet manufacturer) in Nacala, where commercial agreements can be formulated. Similarly, Casa do Agricultor will be assisted on linkages with local artisans and master trainers who will provide services for silo production and quality control, respectively.</p> <p>Casa do Agricultor will adopt 2 production and marketing schemes:</p> <ol style="list-style-type: none"> <li>As outlet / One Stock Shop: Artisans will invest in raw materials for metal silo production, manufacture silos directly and, based on agreement, use Casa do Agricultor's shop for marketing.</li> <li>As Investor and owner: Based on demand for metal silos, Casa do Agricultor will invest in raw materials for metal silos production, contract artisans to produce silos and market directly. The project will assist by providing first 5 silos of 200kg, 400kg, 800kg and 2 prototypes of 30kg capacities for demonstration in the shop.</li> </ol> <p><b>Purchasing of Raw material</b></p> <p>MMI Steel will handle over or deliver the purchased metal sheets to Casa do Agricultor through their outlets or home delivery. Other input suppliers such as intermetal, electroferrageira and Gani Comercial provide other materials such as Tin, Acid, etc. The cost of material will at market price or depending on the agreements between Casa do Agricultor and metal sheet manufacturer. The recommended quality of metal sheet is 0.5mm thickness and 1 m x 1.6 m size.</p>
Master Trainer	M&E of metal silo production / quality control and labeling system	
Farmers / finally clients	Main clients (beneficiaries of silos, participate in the trainings, demonstrate the silo)	
FUTURO	MFI / Bank institution (provides loan and training on financial aspects)	
GAPI	Microfinance institution (provide loan and training on financial aspects)	
FDD	Fund for Local Development financed by central government (financing products)	
Casa do Agricultor	National distributor; Owner and leader of the business model (invests on production and distribution/ main outlet, promotional activities)	

MMB Lda	Local Agrodealer; Owns the business (invests on production and distribution)	<p><b>Silo Production</b> The production of metal silos will be straightly controlled for ensuring quality and only trained and skilled artisans will manufacture. Each artisan will be registered and numbered for traceability. Based on demand for massive silo production, the project will train additional artisans in selected areas and/or train 4 artisans of Industrial Institute of Carapira in Monapo for silo production, until end of 2019. After one year, Casa do Agricultor will invest on artisan training and based on the agreement the investment can be considered as credit and amortized by artisan during silo production process.</p> <p><b>Traceability and Quality Control</b> Quality of silo is to be ensured along the metal silo supply chain. The project will develop capacities of Casa do Agricultor, SDAE technicians and Farmers Unions with basic quality standards. Casa do Agricultor will contract master trainer to supervise and ensure quality control during silo production process. Master trainers service payment will be included in the final price of each metal silo. Each silo will be having a sticker poster with general information on how to use and handling, name / number of artisan, number of silo, place of purchase and name of buyer. This information will be used for traceability of metal silo. The project will assist by providing 100 silo stickers posters.</p> <p><b>Sustainability</b> The sustainability of this process will be ensured by strengthening Casa do Agricultor through linkages with micro finance institutions (MFI), Artisans, master trainers, promoters and group of farmers. The agreement with Casa do Agricultor includes promotional activities which are explained below.</p> <p><b>iii) Local Agrodealers (LA1: ADAMO and LA2: MMB Lda)</b></p> <p><b>LA1:</b> Nheta Adamo, is an agronomist and a local trader, works individually as input and service provider in Chiúre, Montepuez, Namuno and Nangade districts. He was trained by the PHM-SSA project as a PHM trainer in 2015. The main products supplied are seeds, fertilizers, agrochemicals, tools and agricultural mechanization, and agricultural technologies. In addition, it focuses on the training and provision of technical assistance services to farmers and NGOs on PHM issues. In 2017 he had business partnership with COOSEN as agent based on payment by commission per metal silo sold. Adamo is the key actor and the owner of the business with the role of PHM technology vendors and will provide technical advice to farmers on how to use the metal silo through technical sale approach.</p> <p><b>LA2:</b> MMB Lda operates as input supplier as part of product dealer of Casa do Agricultor based in Montepuez, with retail shops in Namuno and Chiúre. The main products supplied are seeds, fertilizers, agrochemicals, tools and agricultural mechanization, veterinary products, garden equipment and PHM technologies. The company is</p>
	Nheta ADAMO Local input provider (invests on metal production, distribution and marketing)	

working with INOVAGRO in the seed supply chain and training in business plans.

The project will establish an agreement with both agrodealers to promote and market PHM technologies greatly in Cabo Delgado province, and provide dissemination materials such as posters and leaflets. Basic knowledge on how to quality standard will be provided to ensure quality control (embedded quality control).

The project will facilitate market linkages with market actors along the input supply chain. Initially, the project will assist the first contact between the agrodealers and MMI Steel based (metal sheet manufacturer) in Nacala, where commercial agreements can be formulated. Similarly, the trader will be assisted on linkages with local artisans and master trainers who will provide services for silo production and quality control, respectively.

On other hand, the project will facilitate the linkage with Banco FUTURO and other interested Micro Finance Institutions for acquisition of loan oriented towards PHM investments.

LA1 and LA2 will adopt the following production and marketing scheme:

- a) As Investor and owner of the business: Based on demand for metal silos, LA1 and LA2 will invest in raw materials for metal silos production, contract artisans to produce silos and market directly. The project will assist by providing first 5 silos of 200kg, 400kg, 800kg and 1 prototypes of 30kg capacities for demonstration in the shop.

#### **Purchasing of Raw material**

MMI Steel will handle over or deliver the purchased metal sheets to LA 1 and 2 through their outlets or home delivery. Other input suppliers such as intermetal, electroferrageira and Gani Comercial provide other materials such as Tin, Acid, etc. The cost of material will at market price or depending on the agreement with metal sheet manufacturer. The recommended quality of metal sheet is 0.5mm thickness and 1 m x 1.6 m size.

#### **Silo Production**

The production of metal silos will be straightly controlled for ensuring quality and only trained and skilled artisans will manufacture. Each artisan will be registered and numbered for traceability. Based on demand for massive silo production, the project will train additional artisans in selected areas and/or train 4 artisans of Industrial Institute of Carapira in Monapo for silo production, until end of 2019. After one year, LA1 and 2 will invest on artisan training and based on the agreement the investment can be considered as credit and amortized by artisan during silo production process.

#### **Traceability and quality control**

Quality of silo is to be ensured along the metal silo supply chain. The project will develop capacities of the agrodealer, SDAE technicians and Farmers Unions with basic quality standards. LA will contract master trainer to supervise and ensure quality control during silo production process. Master trainers service payment will be included in the final price of each metal silo. Each silo will be having a sticker poster with general information on

how to use and handling, name / number of artisan, number of silo, place of purchase and name of buyer. This information will be used for traceability of metal silo. The project will assist by providing 50 silo stickers posters.

### **Sustainability**

The sustainability of this process will be ensured by strengthening ADAMO through linkages with micro finance institutions (MFI), Artisans, master trainers, promoters and group of farmers.

The agreement with LA includes promotional activities which are explained below.

#### **iv) Local Artisan**

Artisans are service providers as well as business owners in this business model.

- a) Artisans as service provider: Based on the contract with Agro-input suppliers they will produce the silo and paid against each silo produced. Strategically they can also demonstrate to the neighbours. The training package provided by the project includes production, use and handling of standardized metal silos.
- b) As Investor and owner of the business: Artisans individually or organized as cooperatives will invest in raw materials and produce metal silos. Marketing of metal silos will be done directly by them or, based on agreements, artisans will use Casa do Agricultor's shop for selling.

The project will facilitate trainings and market linkages with market actors along the input supply chain. Initially, the project will assist the first contact with input suppliers for materials and tools such as metal sheets, tin, acid, etc. Similarly, the artisan will be assisted on linkages with Casa do Agricultor and other agrodealers.

On other hand, the project will facilitate the linkage with Banco FUTURO and other interested Micro Finance Institutions for acquisition of loan oriented towards PHM investments.

#### **v) Cooperatives (Seed Producers)**

The Cooperative is profit oriented group of organized farmers, based in communities involved in production and marketing of grain and seed of different crop value chains.

One of their main challenge on seed value chain is proper handling and storage for quality ensuring especially on germination capacity.

AMPCM is the organization which is strengthening cooperatives in Nampula and Cabo Delgado. The project will establish an MoU with AMPCM to integrate facilitate a map and coaching of the existing cooperatives.

In this business model, the cooperatives will be having 2 roles:

- a) Sales Committee: the cooperative will act as sales agent. The project will facilitate the contact with Casa do Agricultor, Agrodealers and Artisans. Based on agreement, the input supplier will deliver silos to the cooperatives and for each silo sold a percentage commission will be provided as payment.
- b) Owner of the business: cooperatives will invest in raw materials for metal silos production, contract artisans

to produce silos and market directly to the member or other farmers.

**vi) Master Trainers:**

Master trainer is a service provider to supervise the production of metal silos and ensure the quality standards are met by the artisans. His involvement in production cycle will be motivated by owner of the business who intends to market silos. At the beginning the project will provide an intensive training as master artisan and quality parameter checklist. The production and marketing of metal silos will be straightly controlled.

The quality of silo is directly related to two aspects:

- a. The manufacturing capacity of the artisan and
- b. The quality of the materials

Both are important factors which have to be guaranteed and accurately controlled by all involved actors along the supply chain. The importance of being precise is the only guaranty that the silos is hermetic, an undeniable requisite for good conservation conditions. A quality control and labeling system is to be introduced and monitored. This will include a sticker which will be pasted on the silo with relevant information for proper traceability. The project will provide trainings on quality standards to relevant actors along the supply chain such as extensionists, agrodealers and local traders.

The motivation to invest in quality will be to meet client's satisfactions and acceptance of the technology.

**vii) Metal sheet producers:**

The project has established an agreement with metal sheet producer company, MMI Steel, for provision of galvanized metal sheets and promotional material like posters, leaflets and radio programs with shared costs as follows:

- They will share the cost of production and multiplication of silo poster with a participation of 25% which will be used for installation of demonstration fields.
- Sharing 25% of the cost for production and broadcasting of a radio program promoting metal silos and GI sheets for roofing.
- Include promotion of Metal silos through their Sales Program and retailers.
- Provide the project with good quality flat galvanized metal sheets at a reasonable and fair price.

The project facilitates the establishment of commercial agreements between MMI Steels and metal silo business owners.

**viii) Financing mechanism:**

The project has contacted several Microfinance institutions (MFI) and presented different business models and 3 financing institutions were found interested to invest in PHM issues namely Bank FUTURO Mozambique (financed by SDC), GAPI and BNI (Government outsourcing).

The 3 financial institutions have common objective of providing products and services, including advice and advice typical of investment banking, fund management and market access.

### **Financing Structure**

The MFI / Banks have an interest and motivation to develop and/or refine specific products / packages to the needs of each project, in order to optimize the structure of the project, to mobilize financing appropriate to its risk profile, return and cash flow.

At beginning the project will facilitate linkages with local agro-dealers and a market assessment will be conducted by MFI/Bank team composed of an Agronomist, credit expert and researcher. Based on the findings, potential beneficiaries will be identified and profiled. Depending up on the profile a coaching will be delivered by MFI / Bank.

In this business model 3 financing models will be adopted, based on the beneficiary:

#### **a) In-kind or credit for consumption.**

This credit is associated with the purchase of certain higher priced products.

This model will be targeted to farmers. A farmer will apply for the loan with specific need for metal silo acquisition and MFI / Banks will provide the in-kind credit, which means, the Bank or MFI will order the silo with the Agrodealer, cooperative or artisan who sells the silo. The silo and grain stored itself will be used as collaterals. The silo filled with grain and 2 locks will be managed by the farmer as the owner. For security reasons both farmer and bank / MFI will hold keys.

This model is based in the logic that very often the price for grain increases throughout the year. This can minimize immediate sale of grain by farmers at the time of harvest when price is lower.

In the first year, the project will assist the farmers by linking with potential buyers such as processing and milling industries which require good quality grains throughout the year. During the initial stage, farmers will be trained on best practices of postharvest and handling of metal silos. The project and partners such as SDAE and UPC (Farmers Unions) will provide necessary technical assistance and depending on farmers' profile recommend the MFI / Bank.

#### **b) Cash or credit for small enterprises**

This credit is aimed at supporting business activities and can be obtained from financial institutions, but also from public institutional entities, which include those that manage community funds.

In this model, MFI / Banks will provide loans to small enterprises owned by input suppliers such as agrodealers, cooperatives and artisans. The input suppliers will prepare and apply for credit against a viable business plans.

In order to expand the services, the MFI / bank will identify potential agrodealers who can hold a business contract to become an agent to provide a credit to farmers and other input suppliers in a given radius.

### **Risk management**

The MFI / Banks (BNI) and the project will look for alternatives to market risk coverage, tailored to the needs and

exposure of each client, based on the evaluation of the market risks in which it is incurred and the evaluation of its financial risk profile. The project in collaboration with MFI / bank will include a package of training on management and financial education to farmers to increase awareness about credit and reduce risks of non-devolution.

At the beginning, the project will assist the MFI / Bank, whenever potentially required to identify the opportunities, analysis, evaluation and structuring of the operation, development and refinement of financial packages until the negotiation and closing of the transaction. The project will ensure by involving other relevant actors such as local authorities and farmers Unions.

**ix) Marketing strategies and promotional activities:**

It will be a shared task with the public institutions, NGOs, Farmers Unions and private sector.

The project will develop capacities of the actors and share the costs of promotional activities which include production and dissemination of audio-visual materials such as posters for silo and labelling, leaflets with relevant information, radio program, PHM fairs and exhibitions, etc.

Currently the project has established agreements with Rural Advisory Services, respectively, Ministry of Agriculture and Food Security (MASA) through SDAE, and Farmers Unions (UPC Cabo Delgado and UPC Nampula) to train and advise farmers on best practices of PHM, identify and select interested farmers for demonstration of metal silo, including the use and handling of metal silo to create a demand.

These partners will be working in straight collaboration with local input suppliers such as Casa do Agricultor, MMB Lda, ADAMO, local Cooperatives to provide relevant information which includes the list of farmers interested for silos.

The input suppliers will establish a contract with community-based sales agents, extensionists and promoters. An incentive is to be provided attributed to each sold silo.

**x) Production cost for metal silos:**

The table below shows the cost structure of raw material and final price of metal silo.

The cost of silo is estimated as follows: MZN 1.500 for 30kg (prototype), MZN 4.000 for 200Kg, MZN 5.000 for 400Kg, MZN 7.500 for 800Kg silo and MZN 8.500 for 1.000 kg storage capacity.

## Price calculation for metal silos

**date: October 2018**

Heading	Unit price		silo demo (30kg)		200 kg		400 kg		800 kg		1000 kg	
	Unit	Price en Mts	Unit	Price en Mts	Unit	Price en Mts	Unit	Price en Mts	Unit	Price en Mts	Unit	Price en Mts
Metal sheet 1 x 1.6m (0.5mm)	cal 0.5mm (G26)	920	0.6	552	2.5	2,300	3	2,760	4.75	4,370	5.5	5,060
Tin 50 : 50 (lead : tin)	100 gr	130	1.6	208	3.75	488	4	520	6	780	7	910
Charcoal	kg	10	1.5	15	3	30	6	60	8	80	10	100
Pine resin / Amonium chlorid	kg	30	0.1	3	0.2	6	0.3	9	0.4	12	0.5	15
Hydrochlorid Acide	dl	60	0.1	6	0.15	9	0.2	12	0.25	15	0.3	18
Aluminium Paint	lt	175	0.025	4	0.05	9	0.06	11	0.07	12	0.08	14
<b>material cost</b>				<b>788</b>		<b>2,841</b>		<b>3,372</b>		<b>5,269</b>		<b>6,117</b>
Transportation						250		250		250		250
labor cost				300		400		600		750		375
Dépreciation tools and workbench				10		15		20		25		30
<b>cost of the silo</b>				<b>1,098</b>		<b>3,506</b>		<b>4,242</b>		<b>6,294</b>		<b>6,772</b>

US\$		18	58	71	105	113
Price per 100 kg en US\$			29.2	17.7	13	11
Price per 100 kg en Mts			1753.1	1060.4	787	677
Change rate 1 US\$ =	60 Mts					
<b>Cost of Metal sheet and tin bar</b>			<b>80%</b>	<b>77%</b>	<b>82%</b>	<b>88%</b>



