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Multi-purpose Village Workshop

Guidelines for implementation

INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT (IFAD)
UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION (UNIDO)

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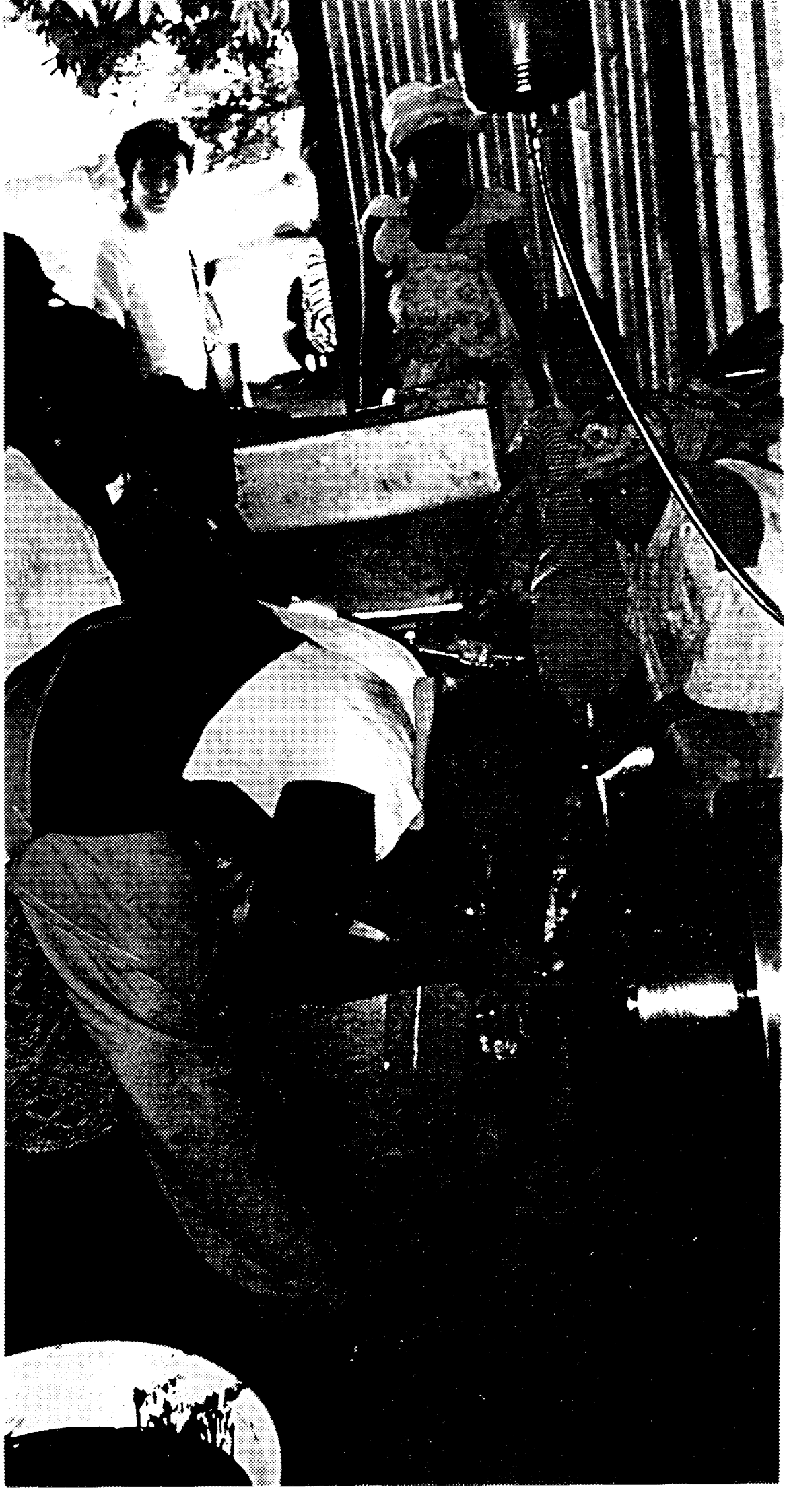


Multi-purpose Village Workshop

Guidelines for Implementation

Introduction

Women carry out almost 80% of rural food production in Africa, thus underlining the crucial role they play in the local economy. The heavy workload women carry has a direct impact on the wellbeing of the family. The lack of mechanisation means that many time-consuming tasks are performed by manual labour. Many of these tasks could be done more efficiently by machine. They are primarily related to food processing activities, such as the crushing and grinding of grains, the hulling of oats, the husking of rice and the shelling and the pressing of nuts and seeds. But unless economic feasibility of the operation is assured, simple mechanisation does not necessarily help women become more independent, or to allow them to gain more control over their lives. The Multi-purpose Village Workshop is a small, diesel engine-driven installation for processing agricultural products (milling, hulling and pressing). In addition, the engine has the capacity to drive a generator for electricity through which services like welding, battery charging, water pumping and lighting can be supplied. Primary target groups to benefit from the availability of these services are the rural women who might, or might not, choose to take legal ownership of the installation. A pilot project showed that although implementation of such an installation is by no means an easy task, the benefits and impact on the village are very tangible.

How the approach is introduced into the village setting is very important. While the goal (long-term impact) may be to reduce the time women spend on non-productive activities, the means and the objectives should be framed within an enterprise development logic. This means that the emphasis would be to develop entrepreneurial skills through the offer of credit directed towards the purchase of the equipment and/or towards the generation of income through other means to enable women to pay for these services. In fact, the primary gain may be in the new productive activities women will perform through a shift in their time allocation.

To ensure sound investment decisions, an economic analysis needs to determine whether a village has the required market for each of the services provided by the multi-purpose village workshop. This analysis will show if the investment is justified. The motor represents a substantial investment for an individual or a group enterprise. Not only must the market be assessed, but also the feasibility of the technical supporting frameworks (e.g. repairs and maintenance services). If these services are not available locally, the project must ensure their introduction.

These guidelines are for the purpose of primary introduction of the concept of a multi-purpose village workshop based on the lessons learned from a pilot project in Burkina Faso and Mali. This project was initially financed by the International Fund for Agricultural Development (IFAD) and the United Nations Industrial Development Organization (UNIDO). The guidelines also incorporate experiences from other rural development projects and existing guidelines in related areas, e.g., female entrepreneurial activities and small credit schemes. These guidelines will be regularly updated based on additional lessons to be drawn from new projects in various countries.

• The project was continued with the participation of the United Nations Development Programme (UNDP) in Mali.

What is a Multi-purpose Village Workshop?

➧ A tool that permits more efficient working methods

The multi-purpose village workshop consists primarily of a (8 HP) motor and a stone plate mill for grinding cereals. Depending on the desires of the owners (and the local market) additional potentially profitable equipment can be added. Such additional extras may include a metal plate mill for shea nuts, a dehuller for coarse grains or rice, an oil press, a welding post, a battery charger, a hay cutter, a 220V alternator to provide electricity, an electric water pump and a circular saw. With this equipment, one basic motor can generate additional revenue, thus rendering the whole operation more viable.

The size and power of the engine can vary. Experiences in Western Africa (Mali and Burkina Faso) have shown that a 5 or 8 HP diesel engine is a relatively simple, low-cost engine running at low revolution speeds, with one or two cylinders. Because of its simplicity, repairs and maintenance can be carried out relatively easy.

➧ What services does it provide?

Based on economic, sociological and technical studies conducted so far, the following services could be offered by a village workshop.

A. Processing of locally produced cereals and other agro-based raw materials as the major thrust of income generation sources by village workshop activities.

- Milling of cereals (maize, sorghum, fonio, beans, millet, rice, etc.)
- Hulling of cereals
- Oil-pressing of groundnut, shea-butter nut, sesame, cotton seed, etc

B. Secondary activities to run auxiliary equipment used for other income generating and service activities, using energy generated from the diesel motor installed for the operation of processing activities.

- Water pumping for drinking water, welding and saw milling
- Battery charging

C. Generation of energy for infrastructure development services in rural areas and/or isolated regions. This is technically possible, but requires a careful analysis of economic and financial viability for a private enterprise.

- electricity for lighting
- water pumping for micro irrigation

Why would you introduce it?

BASIC ASSUMPTIONS

If women are freed from time-consuming tedious and repetitive tasks, they will engage in more productive and income earning activities in the agriculture, livestock and off-farm sectors, particularly food-processing activities. Improved agricultural production yields a surplus, which could be sold on local or regional markets. As a result, rural income will be improved and rural living standards will rise.

How do you introduce it?

While the village workshop can have immediate benefits to a village, the sustainability of the operation is of at most importance. It should only be introduced where its medium-term viability in terms of financial, technical and managerial inputs can be ascertained. "The enterprise concept" is adopted for the purpose of these guidelines. Under this concept, a technical cooperation project for introducing a village workshop through local intermediaries and financed by external assistance could play a supporting role during the start-up and development of these enterprises.

➔ The enterprise concept

The village workshop is an investment by an individual or a group in order to develop an enterprise for the purpose of creating a profit. The profit may be derived from two separate means:

a) The services provided by the machine are sold and generate a profit. The challenge will be to find the right mix of services that can be sold

to the village and local market, and that are profitable. This will depend on the income level of local residents, and their ability and desire to pay for the services that the village workshop generates.

b) The shift to other productive activities by the owner/s (usually a group) allows them to generate profit. This model tends to combine the sale of services from the machinery and the income derived from other sources in a single enterprise model. This can also affect the demand for the service, since it may be assumed that any additional output that needs to be transformed may be generated by the additional time that women can put to the effort. Thus both demand and supply are affected.

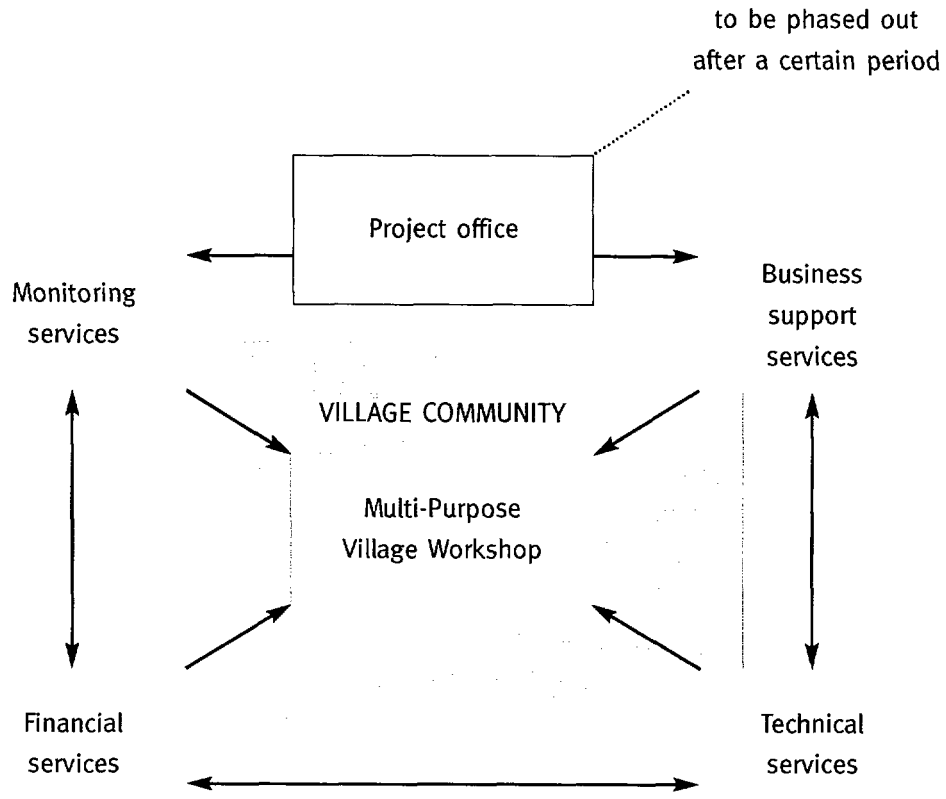
Futhermore generating energy for village lighting and water pumping for mini-irrigation systems is "technically" possible and could be linked to the initial agro-processing activities. However, experience shows that, unless subsidised, these activities are not always economically viable for a private enterprise undertaking. Therefore, energy generation and water pumping would be outside the framework of the economic enterprise concept.
Sample models of installation and approximate costs are presented in Part II, page 12-13.

Basic Institutional Requirements

The process of actual implementation of a village workshop will largely depend on local conditions in social, cultural and/or legal terms. The organizational framework to support this process must include the following:

- **Business support services** (start-up and follow-up). This can be provided by an NGO, which has existing capacity to deliver entrepreneurial services.
- **Technical services** in the form of a mixture of institutions – including NGOs, local mechanical workshops and the private industrial sector.
- **Financial mechanisms** for the entrepreneurs, preferably a local commercial bank or cooperative. In some cases, the project may need to institute its own financial mechanisms, e.g., a revolving loan fund or guarantee fund.
- **A monitoring mechanism** ideally performed by a local government agency or NGO that will ensure the project continues after the end of donor funding.
- **A project office** – to be phased out at the end of the project – that builds the institutional capacity to deliver project components.

Basic Institutional Requirements



It is the sustainability of this institutional setting that will determine the survival of the village workshop activities beyond donor funding and/or external assistance.

The first priority is to identify existing institutions that could carry out the activities of the village workshop, and to design a training plan to ensure their capacity to deliver services to rural villages. It needs to be ascertained that all necessary services as mentioned above are available locally. If there are no suitable institutions in the vicinity, it may be necessary to create one by providing support and assistance, as well as by organizing technical/ managerial capacity building programmes. The project could hire and train staff to run a local business support office. However, institutional sustainability should be ensured by the creation of an NGO, a private sector firm, or a unit in a local government office.

The following skills are necessary to ensure the village workshop is managed and operated successfully.

- **Technical skills:** Someone who delivers the service, who ensures quality, who understands the motor and other machinery. This person should be able to do simple repairs and maintenance work. This is generally, but not exclusively, a function of a trained technician who is paid by the owner(s) of the village workshop – e.g. village community, individual and/or group enterprise.

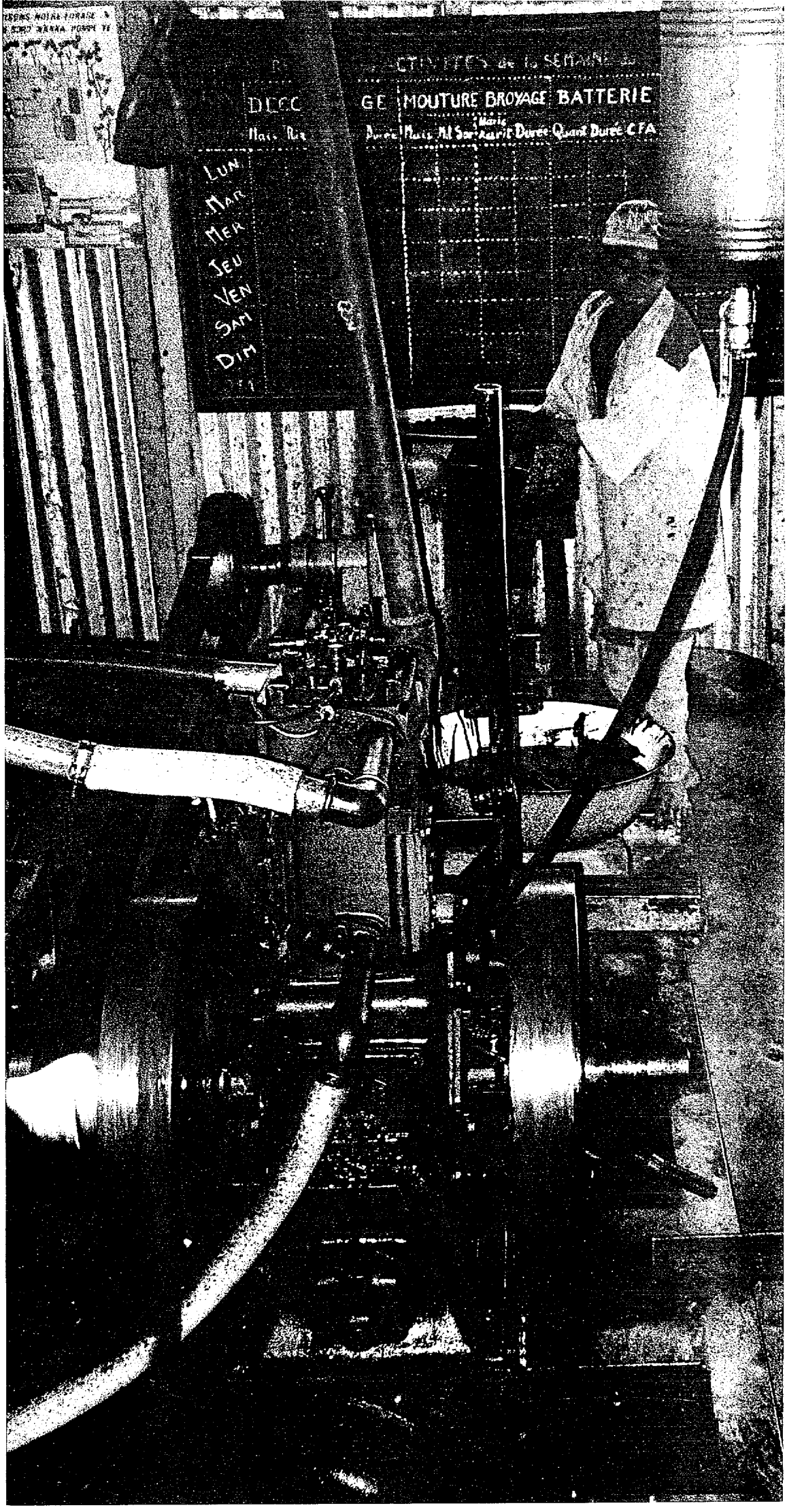
- **Managerial skills:** Someone who is responsible for billing, collecting of owed money and who is in charge of all the account procedures of the operation. This person can also be responsible for procurement of supplies needed for the workshop operation (fuel etc.) Generally a paid function.

Proposed Logical Framework Analysis for a Multi-purpose Village Workshop Project

The output refers to short-term results, outcome to medium to long term results. For instance in a training course, the output is the number of people trained, the outcome is the behaviour which has been modified through training.

	Output	Impact	Indicators	Risks/Conditions for Success
Goal Through mechanization, reduce the time women spend on food processing activities	Mechanized agricultural processing in villages; higher agricultural outputs.	Income in villages rises; cash economy allows for diversification of products; better social indicators in villages.	Socio-economic data on villages.	Agricultural output is not affected by climatic or other adverse conditions. Political will to help project.
Objective (no. 1) To facilitate women's ownership and management of industrial businesses	Women own and manage multi-purpose workshops which include mills, crushers, grinders and other machinery offering services to local populations	Improved income, health and education for women in the village. Empowerment, selfconfidence of women improved as a result of "successful" business activities.	Income, health and education data Women's increased participation in decision-making bodies in the village Programme expands throughout the country.	Ability of project to interest women to take investment risk. Openess of men in villages to support female entrepreurship.
Objective (no. 2) To promote (pre) industrial businesses offering food processing services in local communities.	x-number of businesses operating in local communities.	Women access the food processing services and shift their time to productive activities	Number of loans disbursed: repayment levels. Increase in income in the village.	Income in the villages (e.g. levels of cash economy) allows women to purchase the services. Sufficient agricultural output to render services profitable.

Project components	Output	Outcome	Indicators	Risks
Business start-up and advisory programme	Local organization has the capacity to deliver a programme of support to start-up enterprises.	Outcome Businesses assisted by the project are 'healthy' and expanding.	Loan repayment rates; balance statements of businesses; expansion of businesses.	Institutions and individuals can be found and trained to deliver the program.
Financial Services	Clients (entrepreneurs) have access to financial services to fund their enterprise.	Financial sustainability of project services are assured (direct charges and or interest rate +12% allows the business services to survive)	- full utilisation of funds - few credit applications rejected - income statement of business support program indicates cost recovery and expansion of its services.	Sufficient financing available through commercial banking system or 'project' (donor) to finance both the entrepreneurs and to generate revenues for business support service providers.
Technical Programme	Local capacity to train owners and mangers on the operations and use of machinery. Local capacity to repair the machinery. Supply of machinery available.	Good maintenance and operation of machinery ensures steady service, fewer replacement and repair costs, healthier businesses.	- few breakdowns of machinery - client satisfaction of product; increasing client demand for services; - new elements (machinery) added to work-shop (expresses comfort level with machinery).	Price of machinery allows for profitability of enterprise. Local capacity available that can be trained.
Local cooperation	Additional services to villages, e.g. literacy, improved technology, agricultural extension programme.	Women access the food processing services and shift their time to productive activities	Will depend on the cooperation which is implemented.	Will depend on the abilities or project staff to generate willingness of local organizations to participate.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Part I:

The Project: Developing Enterprises

Ownership of the Multi-purpose Village Workshop

The form of ownership of the Multi-purpose Village Workshop should be decided at the very beginning of the installation.

- **Individual ownership and management:** An individual entrepreneur takes the financial risk, either by taking out a bank loan or by leasing the equipment from a local entrepreneur. He/she will sell services to the local population in order to make a profit. The entrepreneur is responsible for all the costs of operating the workshop, maintenance, salaries and bank charges. This approach is simple insofar as training is directed towards the entrepreneur and his/her employees, however it has to assume sufficient purchasing power of the community. Because all of the criteria for success are present, the impact may be to favour already privileged villages.

- **Collective ownership and management:** A women's group (cooperative, association or economic interest group) assumes the financial risk to invest in an enterprise whose major expenditure is the equipment. The group takes out a bank loan or leases the equipment from a local entrepreneur, and sells services to the village population in order to make a profit. Some of the income of the enterprise may be earned through other activities given that labour time has shifted to other activities. This system works best with groups already experienced in group-owned enterprises. Collective ownership and management should only be encouraged where a strong tradition of this type of activity already exists, and the group is solidly committed to continuing that activity.

- **Collective ownership and individual management:** A women's group (cooperative and/or association), or a village development committee, procures the equipment (village workshop unit) and rents or leases it to

an individual operator (e.g. a local mill operator). Leasing can be on a weekly or monthly basis. This solves the problems faced by women's groups in the daily management of the village workshop operation. However, as in the case of collective ownership and management, the demand may not be enough to generate sufficient revenues for the owners, even taking into account that the village workshop services generate income. The economic feasibility of the operation should then rest on two premises:

1) that the multi-purpose village workshop is in, and of itself, financially viable

2) that financial viability is based on both the income derived from the workshop activities and from the increased agricultural output or other additional productive activities undertaken by the women.

- **Non-Governmental Organizations or Development Agencies:** The village workshop could be initiated and managed by NGOs, or by other development projects or development agencies in certain areas. In this case, it is the role of the implementing institution to ensure the long-term sustainability of an enterprise activity by identifying and training entrepreneur(s) to take over the village workshop in the long run.

Selection Process

The selection process takes into consideration both the potential enterprise market and the profile of the entrepreneur/s (individual or group).

The Market

- **Size and location of the village**
  The choice of a site for installation of a village workshop will vary significantly. It may be installed in an urban centre, peri-urban neighbourhood or a rural village. Past experience indicates that a village workshop needs to sustain milling and hulling for at least five (5) hours a day. This requires a minimum market of 700-1,000 persons in the local area. The village workshop could be installed in a region where a network of village workshops could be easily developed in order to share the services provided.

- **Products and markets**
  It is essential to undertake a market survey that will indicate if a potential exists to earn income from projected services that are targeted for the enterprise. This includes an analysis of the demand for the products and services of the enterprise within the larger area surrounding the location of the unit, and an assessment of competing services. If competing services exist locally, it should be established whether the planned workshop would be able to provide a better quality and price for its services.

- **Availability of sufficient raw materials to process**
  The products selected should be based on the availability of raw materials (essentially cereals and oil seeds) produced within the area or the region selected. This will ensure the continuous supply of raw materials and facilitate the choice of equipment for the unit.

- **Availability of support schemes**
  The activities of the village workshop should be assisted by various support services for business development, equipment maintenance and repairs, education programmes and credit/financial support schemes, etc. Even if not available within the identified village communities, the possibilities for organizing such schemes to support the work of the village workshop should be carefully explored to ascertain whether there is a readiness, capacity and capability to provide appropriate services.

The Entrepreneur

The existence of entrepreneurial will and risk-taking is a critical element for the sustainable operation of the village workshop. Once the physical location for the installation of a village workshop is identified, a more detailed assessment of the entrepreneurial traits of potential project partners to be involved in the operation and management of the workshop should be carried out.

The Individual Entrepreneur

Entrepreneurial traits: They comprise, inter alia, self-confidence (strong sense of self), creative, independent, common sense, persistence, risk-taker, a determination not to give up, a driving ambition, trusted within the community.

There are many tests for assessing entrepreneurial characteristics. The project could either develop its own tools and/or adapt these available from the variety of tools available in the extensive literature on the subject. These 'testing' tools should be adapted to ensure they are culturally appropriate.

Education requirements: The individual entrepreneur should, by preference, have completed secondary school. According to the level of literacy and numeracy of entrepreneur(s), part of the preparation for introducing the village workshop should be to develop and/or integrate existing literacy training.

Prior business experience: Prior family involvement in business is often a characteristic of successful entrepreneurs.

The Group Enterprise

The nature of the group itself and the relationships within it: The group must understand the economic nature of the undertaking and be prepared to take the financial risk, while being aware of their legal liability. The strength, stability and cohesiveness of the group are important. How long the group has existed, individual attendance at group meetings, dropout rate, turnover of members and the individual's ability to participate – e.g., adherence to democratic principles – are all important in assessing the potential of the group. The group's reputation within the community is also critical, because it will sell its services to the larger area. These characteristics can be fostered through group formation and animation techniques.

Group formation and functioning: Before allowing the group to take on the financial risk involved in launching a village workshop project, it is necessary to establish the above mentioned group characteristics. Requirements include that the group should be in association for at least one year, has a joint bank account and has undertaken some common economic activities. In order to assure commitment, some village workshops would require a minimum primary investment by the group, e.g., 5-10% of the total investment.

Some questions to consider in the selection process:

- How and why did the group form?
- How is the group structured?

- How are decisions taken?
- How does the group organize its work?

- What type of activities or businesses is the group engaged in?
- Are these operated on a part-time basis? Seasonally? Weekly?
- What products or services are sold?
- What inputs or supplies are required?
- How are inputs procured? Cash? Credit?

- If the group has an access to credit, how is it managed?
- What is the repayment rate?

- What is the current level of technology used in the group's activities?
- What skills are available in the group?
- What problems or constraints does the group encounter?

- How are benefits from the group's activities divided among members?
- Is it reinvested?
- Is the entire group satisfied with this system of distribution?
- Will this system of redistribution be applied to the new activity (the workshop)?
- Does the entire group agree with the proposed distribution of benefits?

- How does the group manage conflict?
- How are family members involved in the economic activities of the group?
- How do the men in the village, either individually or as a group, cooperate or interact with the group?

- As a basic requirement, is there at least one fully literate member in the group?

The selection process has allowed for an initial verification of the potential success of the enterprise in a particular location. The next step is to conduct a series of feasibility studies for the enterprise. To the extent possible, these studies should be undertaken by the potential entrepreneur(s). Experience in enterprise development indicates that this is an essential element in the development process of the entrepreneur and his/her business.

The individual or the group can be asked to assess the economic conditions in their village and surrounding area. This may involve assessing whether cash

is available to pay for services or to evaluate population and income growth in their area. At the very least, the entrepreneur needs to show initiative in developing part of the feasibility study.

Feasibility Studies

a detailed market study
a technical study
a financial and economic study

Market Study

The market study is the first step. The information generated by this study is necessary before proceeding to the technical and financial study.

In order to undertake the market analysis, the entrepreneur should understand the four 'Ps' of marketing: product, place, price and promotion.

- what **product** or service the customer wants
- what **price** the customer is willing to pay
- where to **place** the business so that customers can reach it
- how to **promote** the product or service so that customers will be attracted to the business.

The entrepreneur should ask the following sets of questions:

- What products and services are being offered, or planned to be offered?
- How are the products or services marketed and transported?
- Do the goods currently being produced meet market standards?
- Is there room for market expansion, or are there potential markets to explore?
- How are prices determined?
- Is additional training needed to ensure appropriate quality?

- Who will use the services proposed by the enterprise?
- How often would milling, hulling, crushing, battery charging, welding and other services be used?
- What services and products are of most interest to potential customers?

- How much are potential customers willing to pay for each service?
- When can they pay?
- When would they buy (rainy season, dry season, winter, summer, all year round?)

- Who are potential competitors?
- How much do they charge?
- How busy are they?
- Do they have the same variety of services that are being proposed?
- Why do customers buy services presently offered by existing competitors? (Important to establish the reasons by asking local people why they patronise a certain workshop.)
- Are they satisfied with that shop?
- Do they have complaints and comments about how certain services can be improved?

- What is the best location for the workshop?
- What hours should the 'shop' be open?

This type of enterprise is best located very close to a residential area so that potential clients are able to access the services at different times of the day. This may also allow them to process small quantities of cereals when they can afford the time and cash to pay for the services.

Technical Study

Choice of Technology: According to the information derived from the market study, the technical feasibility study will outline which machinery is necessary for the workshop. The basic principle of technological approach for a village workshop is to use an appropriate package of technologies that is:

- Adaptable – already known to entrepreneurs, or in the country;
- Adaptable for multiple requirements;
- Simple, small-scale and cost effective;
- Easy to maintain by using technical skills available locally, or by training artisans, youth, women/women's groups;
- Acceptable to various funding agencies, banks, NGOs, village associations involved in the rural development of the country.

It is useful for the entrepreneur to visit similar enterprises in other locations and to speak with owners and operators to see the benefits and disadvantages of similar equipment.

Preferably, the person(s) designated to operate the machinery should be involved in making the choice of equipment, in visiting the suppliers and in selecting the machinery.

Inventory of technologies: The technical study develops a list of suppliers, options and technical specifications for each potential element of a village workshop.

It is essential that the entrepreneur has an understanding of each potential option, and of its implications for the quality of the transformed product, as well as for maintenance and repairs.

Procurement, maintenance and repairs: Mechanisms to facilitate the micro enterprises for procurement of spare parts and to ensure advance planning of maintenance and repairs to installed equipment. These mechanisms may consider:

- Establishment of supply and maintenance contracts with local manufacturers and importers of equipment;
- Establishment of quality control mechanisms for the local and imported equipment and spare parts;
- Provision of technical training in production and installation of equipment to a few small-scale light engineering entrepreneurs;
- Provision of technical training to machine operators and other persons involved in the management of the village workshop;
- Formation of a network of local artisans and light engineering enterprises to strengthen the technical support to the village workshops;

All these activities are to ensure the availability of local technical skills designed to help guarantee the technical sustainability and reinforcement of local capacity at rural level – particular after the external technical assistance is phased out.

Building: Construction and/or provision of the building for a village workshop should take the following issues into consideration:

- Options to minimise costs
- Appropriate designs and construction materials;

- A design able to house the equipment according to an appropriate layout, while allowing for storage room and future expansion;
- A design that takes into consideration physical safety, hygiene and quality assurance (Reference: Technical Profiles, floor design, see pages 32-36)

The premises should be built by utilising traditional and local materials provided by the village community involved in the establishment of the project. The costs for construction and work should, in principle, be borne by the community – either internally, or by applying for loans or grants by the community members and/or by owner(s) of the village workshop.

Legal aspects of the ownership of land and building: The entrepreneur/group may rent, but the land and building should have a legal framework for its 'use' by the entrepreneurs. It is essential that the entrepreneur has clear and legal tenure (either by ownership or rental) of the land where the workshop operation will be installed. This is often a prerequisite for obtaining credit. Future expansion should be taken into account in selecting a site for the business.

Financial Feasibility

Basic Assumption
Based on the empirical studies of the project, the investment for the installation of equipment for a village workshop would range from 2 million CFA to 7 million CFA (Reference: Cost of equipment and installation, pages 12-13.)

Cash Flow Analysis: this will be conducted on a monthly basis showing a full year, and on a five-year basis.

Costs that are considered:
- depreciation and maintenance costs
- supplies, including fuel
- salaries
- overhead (includes either rental or monthly costs – energy, taxes etc.)

Income:
- cash sales of various services
- credit sales of various services
- other (if the 'enterprise' is larger than the sale of equipment)

It is important to establish the **break-even sales level** in order to establish the minimum level of income necessary to make the enterprise viable. For example, on a volume of $10,000 annual sales, it would be necessary to reach at least US$ 8,000 in order to cover the costs of the enterprise (loan payment, salaries, maintenance, etc.). If projected sales are lower than the break-even point, the enterprise is not viable.

Start-up costs – the level of financing needed: The following are the costs that need to be considered in order to arrive at the financing level required by the enterprise:

Fixed assets: cost of land and improvements, buildings and site facilities including machinery, equipment and furniture. Included are start-up losses, equipment installation costs, preparing the land for the site, etc.

Working capital: the lack of working capital has often been the cause of business failure. It is essential to correctly identify the working cash requirements of the enterprise in order to have a minimum cash balance:

- for operating expenses and debt-service;
- for pre-paid expenses, e.g., fuel;
- for inputs needed for potential secondary enterprise activities (in the group situation).

The decision to invest: The investment decision, whether taken by a private entrepreneur or a group, will be based on a positive outcome of the feasibility study. The investment decision should take into account the following:

- Is the entrepreneur willing to assume the risk implied in taking credit for the amount specified in the feasibility study?
- Can financing be found?
- Will the village workshop generate a profit?
- Is the profit sufficient to justify the investment of time and effort?
- Will the borrower be in a position to generate sufficient revenue to repay the loan and the interest within the expected technical life span of the equipment?

Financing the enterprise: The following elements should be taken into consideration when assessing the financing of the village workshop.

1. Financial Structure

- terms and conditions of credit
- interest rates
- length of and/or existence of grace period
- loan period
- loans and equity
- collateral requirements

2. Inputs

- raw materials
- labour
- utilities: electricity, water, and other energy sources
- other: e.g. rent, taxes, etc.
- training and technical assistance costs

3. Output

- capacity (tons, kgs per year of each element)
- sale price.

4. Investment

- machinery/equipment
- land
- building
- office equipment

5. Working capital

- cash needs (based on financial forecasts)
- inventory (work-in, stock of raw materials, stock of financial resources)
- spare parts
- utilities

The Business Plan: The business plan contains the elements of the feasibility study and:

- a description of the business – ownership structure and legal form
- a description of the services to be included in the workshop
- key personnel and staff.

The entrepreneur will be in a position to obtain financial support only if he/she is in possession of a complete business plan document.

Estimated costs for village workshop equipment and installation

The following model provides some indication of the costs incurred for installation and operation of the village workshop in a setting based on the following assumptions:

- Cost of equipment is based on various documentation prepared for the regional project in Mali and Burkina Faso. It should be noted however that prices existing in the local market vary and the estimated costs presented here are only indicative;
- The prices for services rendered by the village workshop, charges and other costs are different on a case by case basis. Cost estimates are therefore made, based on an average;
- A village workshop is assumed to be able to function for an average of five (5) hours a day for milling and hulling operations;
- The cost for the installed equipment will, in principle, be borne by the village by applying local credit financing. It is however included in the cost estimates in order to show the total financial implications for the investment.

Description	Unit Cost in FCFA	Total Cost in FCFA
Option 1. Basic Structure		
1. Building/prefabricated Shed	450,000	450,000
1. Principal equipment		
• Motor 8 HP	450,000	450,000
• Huller (rice)	250,000	250,000
• Grinding mill metallic (for Shea butter)	250,000	250,000
• Stock	30,000	30,000
2. Installment		
• Chassis	450,000	450,000
• Installment, cooling system, leakage	175,000	175,000
• Revolving fund (for start-up)	5,000	5,000
Total Option 1		**2,060,000**

Description	Unit Cost in FCFA	Total Cost in FCFA
Option 2 Basic equipment and annex		
1. Building (prefabricated shed)	450,000	450,000
2. Principal equipment		
• Motor 8 HP	450,000	450,000
• Huller (rice)	250,000	250,000
• Grinding mill metallic (for Shea butter)	250,000	250,000
• Stock	30,000	30,000
3. Annexed equipment		
• Alternator 12 volt battery charger	150,000	150,000
• Alternator arc welding	275,000	275,000
• Internal lighting of the building	75,000	75,000
4. Installment		
• Chassis	450,000	450,000
• Installment, cooling system, leakage	175,000	175,000
• Revolving fund (for start-up)	5,000	5,000
Total Option 2		**2,560,000**
Option 3. Basic equipment + annex + micro-network of water and electricity		
1. Building (prefabricated shed)	450,000	450,000
2. Principal equipment		
• Motor 8 HP	450,000	450,000
• Huller (rice)	250,000	250,000
• Grinding mill metallic (for Shea butter)	250,000	250,000
• Stock	30,000	30,000
3. Annexed equipment		
• Alternator 12 volt battery charger	150,000	150,000
• Alternator arc welding	275,000	275,000
• Internal lighting of the building	75,000	75,000
4. Installment		
• Chassis	450,000	450,000
• Installment, cooling system, leakage	175,000	75,000
• Revolving fund (for start-up)	5,000	5,000
5. Micro-network of water and electricity		
• Installment of water pump	4,875,000	4,875,000
• Installment of electricity network	3,880,000	3,880,000
Total Option 3		**11,315,000**

FCFA 10,000 = US$ 15.35 as at December 1999

Training the Entrepreneurs

Who should be trained?

Everyone involved in the promotion and operation of the village workshop:

- The unit operators need technical and management training.
- The owner needs management and technical training.
- The support services institutions need training in maintenance and repairs, management and business development.
- The extended staff needs training in monitoring, evaluation and loan recovery.

How to conduct training programmes

- Identification of various training needs according to the owners, entrepreneurs, operators and clients.
- Identification of training institutions and technical partners.
- Preparation of appropriate training manuals/modules by qualified persons.
- If feasible, the establishment of pilot centres for training and demonstration purposes (in collaboration with local and/or regional training institutions and technical partners).

Pre-Training Subjects:

General awareness raising

At the programme formulation stage, and at the beginning of programme implementation, it is important to conduct project awareness-raising activities among the partners involved. The village community, extended staff, economic interest groups, individual and collective promoters of the project should all be involved at this level and the training should cover such aspects as:

- Approach and strategies of the project;
- Responsibilities and obligations of concerned partners;
- Managerial and operational mechanisms to be put in place;
- Resource mobilisation;
- Credit application and loan recoveries;
- Follow-up activities;
- Preparation of training programmes;
- Procedures towards sustainability;
- Follow-up activities foreseen.

Literacy and numeracy training

Depending on the targeted group, it may be necessary to consider general literacy training. At the very least, the group should have one member who can read, write and who is capable of understanding the accounting process. This will have been identified in the selection process. Training in local languages must be carried out in collaboration with appropriate local institutions.

In the group training sessions, it may be necessary to develop visual fiches for illiterate members. This is very important for financial management training as it is essential that all members of the group understand their liability in terms of ownership of an enterprise, and their moral obligation concerning loan repayment.

Group formation, group dynamics and conflict management

The pre-training programme should include animation on group dynamics, the operations of an association or cooperative, rules of conduct in meetings, democratic rights of members, etc. Here is a suggested list of elements of such a programme:

1. The group objectives
2. Optimal and democratic structure of an organization
3. De-centralised decision-making
4. Ensuring accountability of decision-makers
5. Ensuring an efficient management structure for the village workshop.

Specific Training Subjects:

Entrepreneurial Activities and Business Training

The following skills are essential in order to operate a business:

- financial management;
- bookkeeping;
- fundamentals of loan management and savings;
- cash flow analysis and balance sheets;
- organizational structure and functions;
- technology and equipment acquisition;
- legal and legislative aspects of enterprise set-up and management;
- pricing and marketing strategies;
- environmental management and safety requirements.

Training assists the entrepreneurs to set up their own accounting system. In a group situation, all members should be able to understand the accounting process, the importance of cash flows, the need for cash payments and, if credit is extended to customers, the implications that has for the budget. The training should be incremental. Initial training will instruct on how to set up the books. Further training should be undertaken to ensure an understanding of a more, in-depth cash flow analysis.

The training should also include a broad range of issues such as cleanliness and safety requirements, organization of enterprise, environmental concerns, productivity improvement, legal literacy and related requirements.

While the individual entrepreneur must master the full set of skills, in a group situation, a division of work could be introduced. Certain members could be designated for training in specific issues.

Technical Training

The owner/s (if they are the operators) and the staff responsible for operating the machinery should receive in-depth training concerning all aspects of the machinery. Technical training covers:

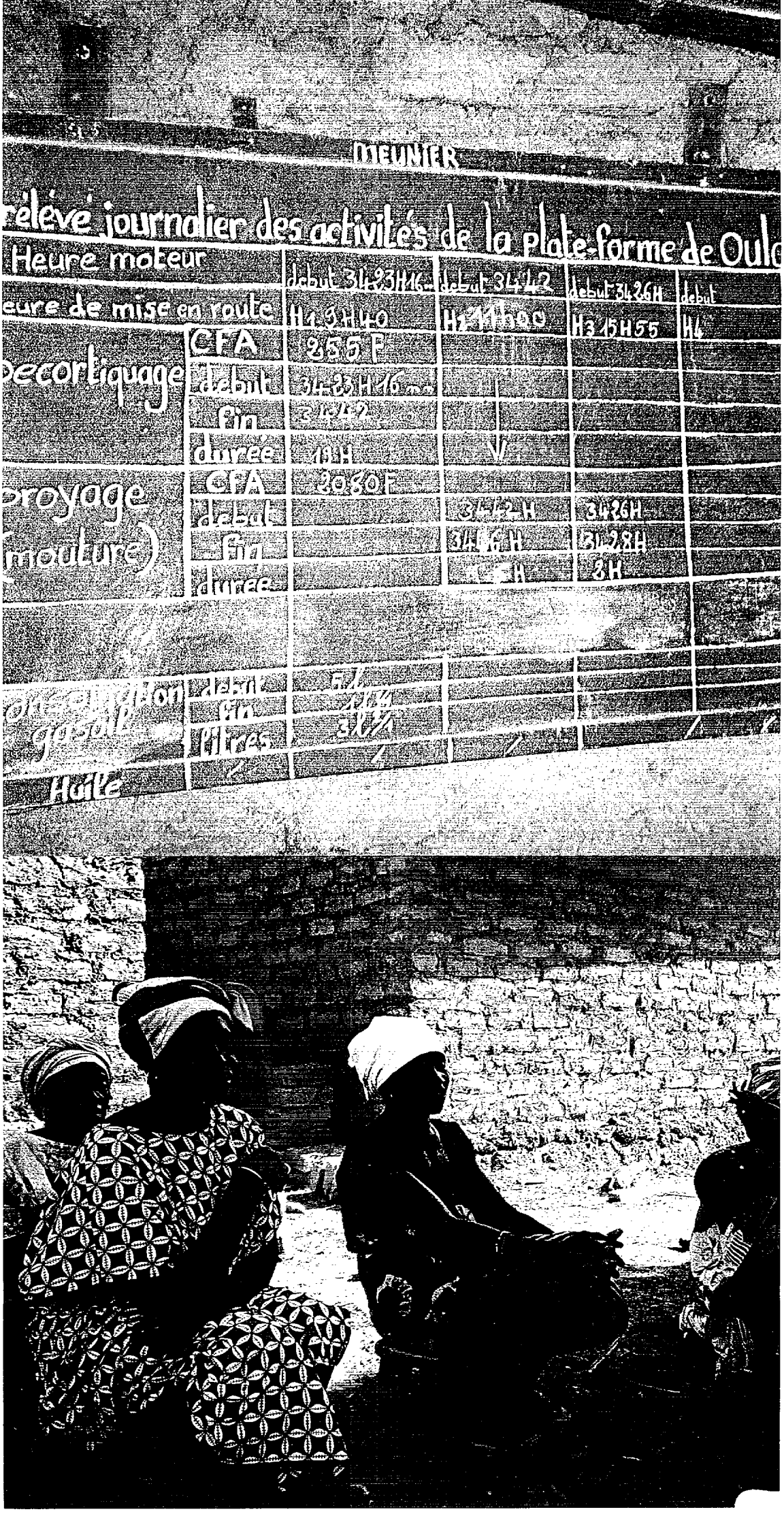
- operation of machinery;
- simple maintenance of machinery;
- simple repairs to the machinery;
- quality improvement of production process, products and services;
- packaging of products;
- physical safety.

It is important – through follow-up and on-the-job training – that the project staff ensures that the knowledge has been absorbed and that maintenance procedures are followed. This is a crucial element in safeguarding the investment of the enterprise.

The lessons learned to date in implementing similar village industries indicate that the technical training period was too short, or inadequate, in order to provide the operators with the required skills needed. It has also been found that dependency on one operator may negatively affect the operations of the workshop. The business should have at its disposal more than one capable operator.

While experiences tend to favour male machinery operators, there are no substantive reasons for this approach. Trained women have also been found capable of operating, maintaining and repairing the machinery.

One important issue to be addressed is the matter of physical safety. Small-scale units generally tend to neglect the safety aspect. It is therefore important that equipment installation be carried out according to a layout that ensures the safety of both workers and clients. In addition, workshop personnel should be trained in safety aspects and specific training modules should be developed for this purpose.


MEUNIER
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Huile

Part II:

Institutional Arrangements — Delivering the Services

Organizing Your Project:

Philosophy:

- Dynamic, effective and stable management of a village workshop stimulates continuous improvement and development of activities and allows the transfer of managerial and technical skills to local communities.

- The institutions left behind have the required expertise to sustain the project's expansion and development.

- A small, centralised office for the village workshop project, which coordinates the activities and installs the necessary systems, is eventually phased out and ownership of the project is transferred to a local institution and/or appropriate bodies.

Prerequisite

The institutional structure will depend on what exists in the country prior to project implementation. At the outset, it is important to determine exactly who will run the project – either a newly created institution or an existing institution. This institution should be located in the region targeted for project activities. It may be a government organization, an NGO, an association (e.g. a business association), or a training/educational institution.

- Institutional set-up, which has the capacity to identify entrepreneurs, assess skill requirements of entrepreneurs and train entrepreneurs.

- Institutional set-up with the technical capacity to identify suppliers, assess their products and services, and to train local service providers.

- Institutional set-up with access to finance – or provision of finance.

- A project management with the capacity to link to other organizations that can provide additional inputs designed to increase the impact on the villages.

On-going support

The installation of the machinery is not the end of the village workshop project. Entrepreneurs need a great deal of support and follow-up.

- Follow-up must be close to the enterprise, sufficient in time, and provided regularly e.g. weekly, bi-weekly and/or monthly visits.

- Follow-up measures progress, but particularly helps the entrepreneur to measure his/her own progress. This allows the support institutions to decide on appropriate next steps, problem solving, troubleshooting amongst partners, etc.

- Follow-up identifies further training needs in business and technical application

- Follow-up identifies other important enterprise development activities, e.g. through visits to other enterprises in order to share experiences.

- Follow-up identifies problems before they arise.

- Follow-up monitors the actual cash flow situation against projections.

Village Workshop Flow Chart

Stages of procedures practiced	Details of activities	Responsibility
1. Place request for the introduction of a village workshop. Seek external assistance	Contacting the project directly or indirectly	Village community/ Entrepreneur(s)
2. Awareness-raising on village workshop: its socio-economic implications, division of work and responsibility sharing, verifying village commitment to the project	Organization of a workshops, series of meetings with the village community	Project Government Village community.
3. Decision to introduce a village workshop	Conducting a series of quick studies on market, technology, financial schemes, socio-economic analysis of the village and needs assessment for skill development, etc;	Village community/ Entrepreneur(s) with help of project
	Review and discussions of the results with village community leaders, women's groups, support institutions, NGOs, and associations	- do -
4. Establishment of a functional management structure (committees) within village community	Assignment of responsibilities and authorities of members of the committee;	Village community/ Entrepreneur(s) with help of project
	Training of those assigned in management, administration and community development, as required	
5. In-depth financial and technological feasibility studies	Calculation of investment costs and verification of financial feasibility of the village workshop operation	Project and NGOs, government institutions
6. Training in management and operation of the village workshop	Training operators, administrators and women's groups in the management of a village workshop	Project, NGOs, government institutions
	Managerial, entrepreneurial and technological training for entre-preneurs who wish to install the village workshop	- Do -
	Provision of additional training such as literacy and numeracy as needed	- Do -
7. Establishment of business and technical support system in the local community	Making arrangement for the delivery of technical, business and support services;	Village community/ Entrepreneur(s) with help of project
	Preparation of service agreements	

Stages of procedures practiced	Details of activities	Responsibility
8. Financing	Identification of sources of funding from their own savings, bank loans, micro-credit financing, etc.;	Village community/ Entrepreneur(s)
	Preparation of loan agreement for financing;	Village community/ Entrepreneur(s) with project
	Opening an account at local banks	
9. Installing the village workshop	Purchase of equipment, spare parts, etc.	Village community/ Entrepreneur.
	Building the premises for a village workshop;	Village community/ Entrepreneur
	Provision of on-the-job training	Village community/ Entrepreneur. With help of project
10. Initial operation of the village workshop on a trial basis	Decision on the length of a trial period;	Village community/ entrepreneur with help of project
	Monitoring and follow-up	
11. Decision to introduce other complementary activities to improve profitability	Identification of needs and requirements for additional investments (battery charger, welding post, circular saw, etc.);	Village community /Entrepreneur. with help of project
	Conduct in-depth feasibility study to evaluate additional needs and viability of the village workshop, e.g., electricity and water supply	- do –
	Formulation of requests for assistance	- do –
	Identification of financial sources	Village community/ Entrepreneurs
12. Installation of water and electricity supply networks	Order of equipment and physical placement of appropriate equipment;	Village community/ Entrepreneurs
	Provision of technical and managerial training	Project, NGOs, government
13. Follow-up and evaluation	Meeting with village communities and entrepreneurs	Project, government, NGOs
	Provision of ad hoc support services and training programmes	- do
14. Reimbursements and recovery of loans	Regular report back and repayment with an expected recovery of 4-5 years;	Village community Entrepreneurs
15. Consolidation, improvements and expansion	Documentation of financial, technical, managerial and administrative procedures;	Village community. Entrepreneurs with help of project
	Review of bottlenecks and drawbacks	Village community
	Preparation of activities as passage for a viable rural enterprise	Entrepreneurs Village community Entrepreneurs with help of project

Business Support Activities

The business support activities consist of:

- promotion of the village workshop;
- identification and selection of entrepreneur(s);
- managing feasibility studies;
- preparing the client for financing;
- provision of managerial and entrepreneurial training;
- monitoring and follow-up of the client, e.g. ongoing business advisory services.

The business support programme also needs to:

- prepare a data base of potential suppliers, provide lists of available equipment and spare parts in the country, list appropriate equipment that can be imported, provide price lists (including potential service contracts with suppliers), assess qualities and weaknesses of each piece of equipment;

- be knowledgeable about the legal requirements of businesses (taxes, health requirements, salaried employees, etc.) so that appropriate advice will be provided to the clients;

- have a list of locally available credit/financing schemes and/or access to financing for their clients;

- develop procedures for selection of potential entrepreneurs and for feasibility studies;

- have the capacity to monitor and evaluate programmes.

Institutional Framework

The institution to implement project activities needs a set of skills and services of an appropriate level. It is unlikely that only one institution with the set of required skills will be found. Thus, each installation of a village workshop usually requires a different set of skills and services provided by institutions. In order to ensure sustainability, these different skills and/or functions need a 'home-base' that will provide overall management of the 'village workshop'. This entity can be an NGO, a private firm or a government service.

The private firm model presents certain limitations, in that only income-generating activities will be continued after the end of donor support.

The NGO and/or government service model will, because of its 'development' nature, continue with activities that do not necessarily generate income. However, the sustainability of the entire operation rests on generating income through services either through direct charges, or through appropriate arrangements with the financial partner – i.e. a commercial interest rate designed to pay for the business development and support services.

The project management model can create management unit for a village workshop but should establish a legal form in order to survive after the project has come to an end.

A demonstration model sells its services to the local community. This model serves the dual purpose of generating income, while serving as a technical training centre for operators of new enterprises in a real workshop situation.

The final decision on which form to take usually involves an assessment of the legal framework of each type of organization, its limitations and its potential strengths. The most important criteria in any organizational structure, is its independence to operate free of political or social interference.

Financial sustainability

Financial sustainability of the village workshop will result from delivering training and technical assistance to the enterprises on a cost-recovery basis, through either a direct charge to clients (the cost of which is included in the loan), or by banking arrangement whereby commercial rates of credit are applied (+1-2% for the cost of the assistance). The project needs to develop a formula that allows for financial sustainability in the shortest possible time, and to find the break-even point after which donor support is no longer necessary.

Technical Activities

The technical programme consists of:

- accessing equipment and spare parts
- operators training programme
- mechanics or technician training programme
- research and development on new and improved machines
- installation of machinery
- follow-up or monitoring of equipment use
- identification and provision of additional technical training

Assessment of capacity of local service providers
It will be necessary for the project to conduct a survey of the existing local capacity to provide for the above activities. A network of artisans, suppliers, industrialists, trained mechanics or technicians and technical trainers should be identified in the area who are willing to service the equipment in the village workshops. An appropriate form of agreement should be established with those identified entities for the provision of these services – including duration, content and terms/conditions of services.

Organization of training of trainers: If there is a lack of service provider skills, the project needs to consider organizing a training of trainer's programme (TOT) to ensure the required capacity. Some of the institutions where required expertise and trainers can be identified are:

- Rural technology centres
- Agricultural extension or research stations
- Agricultural cooperatives
- Agricultural training centres
- Vocational training centres
- Technical schools and universities

Equipment data base and inventories: The technical programme also needs to prepare a data base of potential suppliers, lists of available equipment and spare parts in the country, appropriate equipment that can be imported, prices (including potential service contracts with suppliers), qualities and weaknesses of each piece of equipment.

Financial Partner and Financial Arrangements

The provision of financing, be it for start-up or for continuation of business activities, is the critical element for the operation and sustainability of village workshops. It has to be clearly understood that village workshops should not be perceived as either a grant from a donor or as being provided by a government, together with subsidies.

Forms of financing:

This will depend on:

- financial laws applicable within the country
- structure of the banking system
- rules and regulations – e.g. collateral requirements of the various banks;
- availability and access to local banks by the villagers.

Credit services:

Village workshops need a credit package that includes:

- loan repayment terms of four to five years,
- grace periods of six months to one year (during which time only the interest is repaid),
- a split loan system divided between capital expenditure loans and working capital loans,
- No collateral requirements. A loan to be based solely on the business plan and the reputation of the borrower(s).

Options for financing:

The project has to ensure that viable financial arrangements are in place after it has been completed. The best case scenario is a commercial lending banking system that allows for the appropriate mix of financial services needed by the client. However, in reality, a well-developed commercial banking system usually requires a project to work with a decentralised financial system with savings and loans associations and the like. As an alternative, the project generates its own financial arrangements – either through a revolving loan fund or a guaranteed fund placed with the local bank. The project could also develop leasing arrangements for the entrepreneur, but this option would only finance the capital equipment needed by the enterprise.

Revolving funds

A revolving loan fund is a pool of money raised for a specific purpose. The fund itself generates its own sustainability through a repayment of loans, including an interest rate accounting for defaults, inflation and for the cost of running the operation. NGOs, a government department or a non-banking intermediary organization (credit union, development foundation, etc.) can manage the fund. Credit is offered to individuals or groups who meet the loan criteria established in the project.

It operates along the lines of a bank:

- It makes loans according to terms and conditions that require interest be paid, as well as the repayment of the original amount of loan

- The interest rate reflects existing market rates and covers (a) transaction costs; (b) defaults; and (c) inflation. The interest rate can also cover the cost of providing business advice.

There are distinct advantages to this type of credit arrangement. The full amount of credit in a revolving loan fund belongs to the 'owner' of the fund. It can also involve the client directly in managing the Associated Financial Institution, and it builds on their participation and 'empowerment'.

A Guarantee Fund

A Guarantee Fund is selected as the mechanism in situations where a lending institution will make loans to borrowers if funds are provided to reimburse the lender for defaults above normally expected levels. The guarantee fund can often leverage larger amounts from banks on a minimum of two to three times the total amount of the fund itself. This can be renegotiated once the programme has acquired a reputation for a certain level of loan repayment.

When designing a risk guarantee fund for a project, the following principles should apply

- An agreement is negotiated with a bank or other formal lending institution, under which the bank will make loans from its own funds to targeted borrowers. Donor funds are used as a guarantee to reimburse part of defaults on loans to the bank.

- Guarantees serve as a 'bridge' for a fixed period of time allowing borrowers to eventually borrow directly from the formal lending institution.

- The negotiated agreement with the bank allows the 'project' to set its own terms and conditions for lending, e.g. the financial packages necessary for the project (loan size, grace periods and repayment periods).

The Guarantee Loan Fund induces formal credit institutions to make loans to higher risk clients. It protects the banks, but also provides the borrower with a credit history for future borrowing. It also may be a vehicle to sensitise bank personnel to different lending practices involving poorer clients, especially female clients. The Guarantee Fund can be appropriate when the credit amount is small. The project needs to leverage larger amounts to serve the financing needs of its projected clientele.

Other Partners

When the ownership structure is a women's group, it will be of particular importance to seek partnerships with a variety of agencies capable of providing other inputs to the project. However, any form of ownership will benefit when the project has partners or collaborators who can ensure the necessary inputs.

Research and development partners

Research and development partners can augment the benefits of village workshops by testing new and appropriate rural technologies, such as alternative energy and equipment.

Agricultural Extension Services

If the village lacks surplus that can be sold on markets, it will not be able to pay for the services offered by the village workshop. The programme may wish to seek out the services offered by agricultural extension programmes in order to raise agricultural output in the village. This increases the impact at all levels of the programme – from raising income to raising the economic viability of the workshop. On the other hand, the project can provide new outlets for agricultural produce by facilitating its processing.

National Literacy Programmes

If women's groups represent the targeted group for enterprise formation, then it may be necessary to collaborate with national literacy programmes, or NGOs offering literacy programmes, to ensure development of women's capacities. This will help women's groups to organize and develop their own activities. The literacy programme can base itself on the ABCs of business management.

Part III:

Technical Profiles

The equipment to be added to the motor will, of course, depend on local circumstances and market. In Western Africa the most popular activities are:

(1) milling;

(2) crushing;

(3) battery charging;

(4) pumping and supply of water;

(5) hulling.

Physical Construction

Design and development:

- It is important to involve local R&D institutions.
- Due consideration should be made to the complexity level of services and technology choices.
- It is necessary to take care of technical inspection, alignment/adjustment and eccentricities/vibrations.

Production/Assembly:

- Capacities of local manufacturers should be carefully assessed.
- Local associations of artisans should be involved.
- Possibility of manufacturing equipment/parts should be explored.
- Due attention should be paid to existing technical skills and know-how.

Operation:

- Mechanical safety should be ensured by providing an appropriate safeguard system around engines, machines, connected appliances and moving parts (belts, pulleys, etc.)
- The building should cover sufficient floor space to allow for people to move around it.
- For the purpose of cleanliness, the building and/or shed should protect the installation against water and dust and the floor should be easily cleaned.
- Windows should allow for sufficient light for operation.
- For the electrical safety, it is necessary to properly fuse all electric wires and run through appropriate tubing. Special care has to be taken in wet areas and for the rainy season.
- Attention should be made to the hygienic standard by placing mills/presses, etc. for food processing purposes, in different rooms.

Repairs and maintenance:

- It is important to secure a reliable source of providing spare parts.
- A support network should be identified and/or organized for the provision of appropriate maintenance services.

Disassembly:

- Care should be taken to avoid oil spillage.
- It is important to secure the availability of necessary tools for disassembly.

Floor Plan Design Guidelines

A. The floor plan should match the anticipated use of the different services, e.g., the space requirements will be different in case of clients coming to mill grain and those coming to charge batteries.

B. Adequate shelter is required In case of rain.

C. The miller has to have sufficient space to operate equipment and to carry out maintenance, etc.

D. Physical safety of the people should be very high on the priority list. Safety can be enhanced by:

- an appropriate configuration of the belts and other moving parts;
- by separating the miller's 'working domain' from that of the clients;
- by limiting access to moving parts, belts, etc. to the miller or a person responsible for mechanical work;
- by fitting the machine's belts and pulleys with removable covers.

Appropriate separation can be achieved through:

- full walls: less preferable since they restrict access to light and create more confined spaces;
- half height walls (70 cm – 100 cm): probably the best protection for children and animals. The miller would have access through such walls by appropriate doors;
- Low barriers (30 – 40 cm): people, especially children, will sit on these, so that the safety aspects will not be 100% secured.

E. Pollution and security considerations are also important for various activities of the village workshop:

- prevention of pollution: e.g., any sawing mill operations may pollute grain milling if they are in the same physical space;
- Cereal-hulling machines can cause residues on the alternator. As this material is highly flammable, this can represent a fire risk.

When making decisions regarding a specific floor plan of the installation, the following steps should be taken into consideration and carefully documented. Normally, this process can take 2-4 weeks to complete, depending on the availability of materials, local conditions, service profile, etc.

⇨ **Analysis of functions**

1. What are the services? Who is visiting/ working?
2. What frequency?
3. What are the peak-loads?
4. What storage requirements (even when only for one hour)?
5. Shelter for rain.
6. Accommodation for sitting/ waiting (if needed).
7. Cleaning of floors.
8. How extensions can be provided for at a later date.

⇨ **Concept solution**

9. Make at least three alternative constellations
10. Identify trouble areas
11. Safety
12. Light
13. Rainwater/wind
14. Flow of products (two doors per service might be useful)
15. Cleaning and maintenance
16. Operation
17. Spare parts storage
18. Adjust concept solutions accordingly

⇨ **Mock-up building**

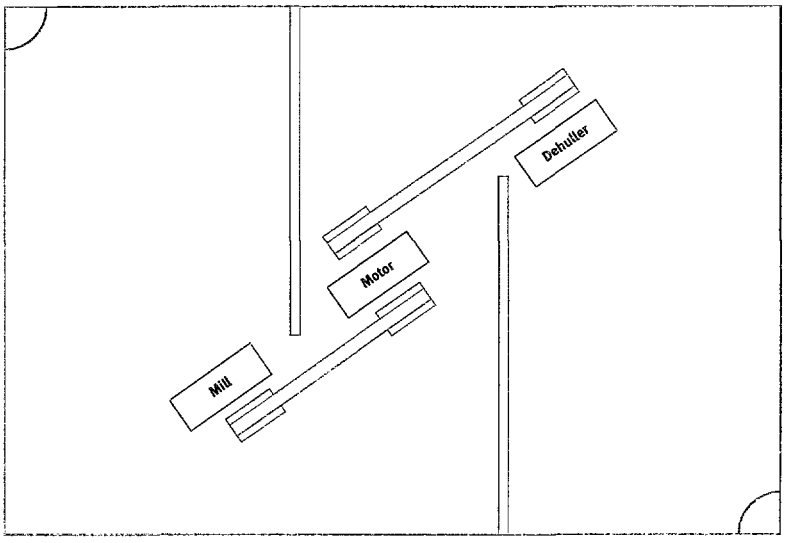
19. Identify unclear issues
20. Build the two best concept solutions as mock-up with thin wood, spars, and nails
21. Check the assumptions in the mock-up
22. Safety precautions
23. Space for miller, starting the engine, etc.
24. Space to install / replace big elements (motor / mill, etc.)
25. Space for services; products, clients

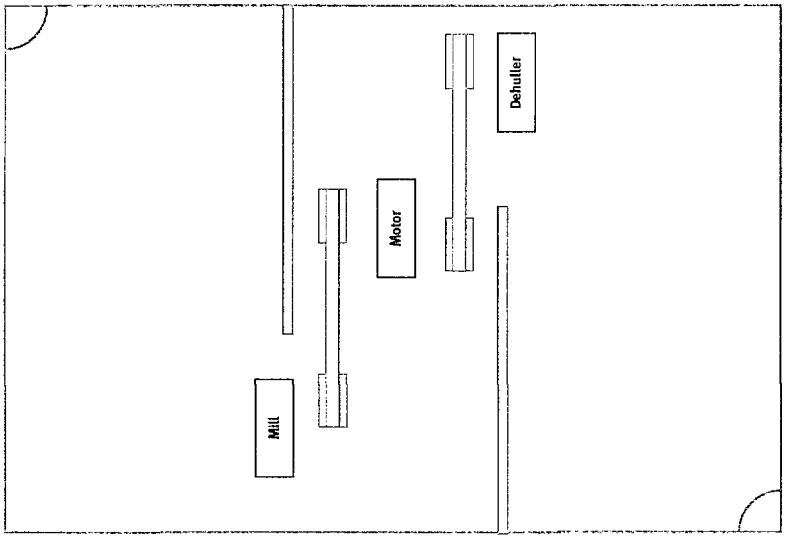
⇨ **Complete the designs based on the tests**

⇨ **Select the best one.**

Some alternative constellations are attached for consideration.

FLOOR PLANS


Dehuller
Motor
Mill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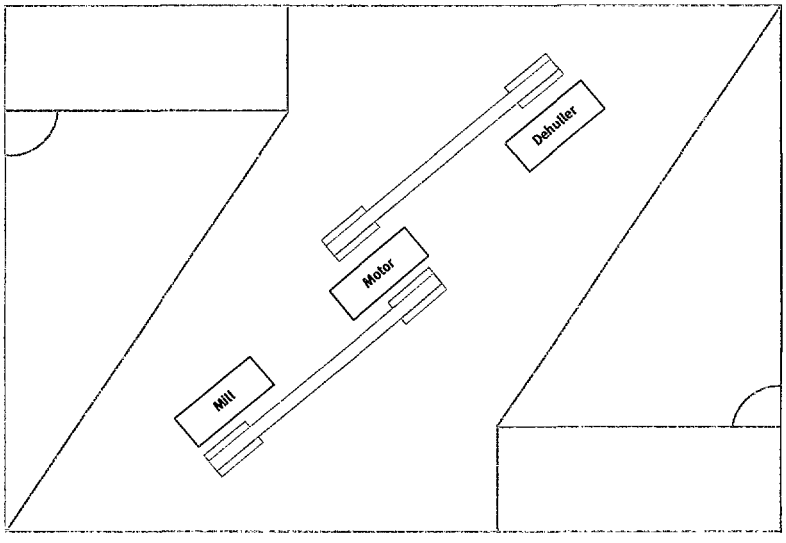
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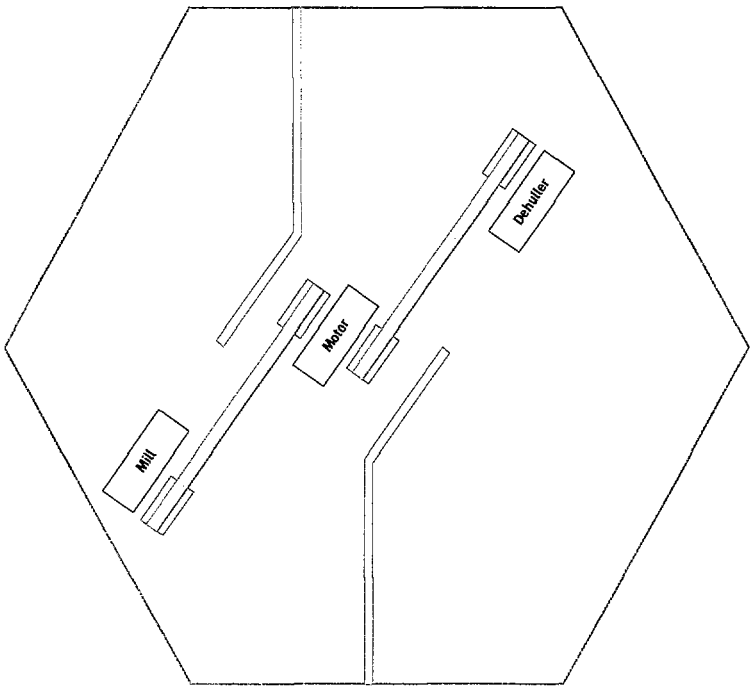
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Motor
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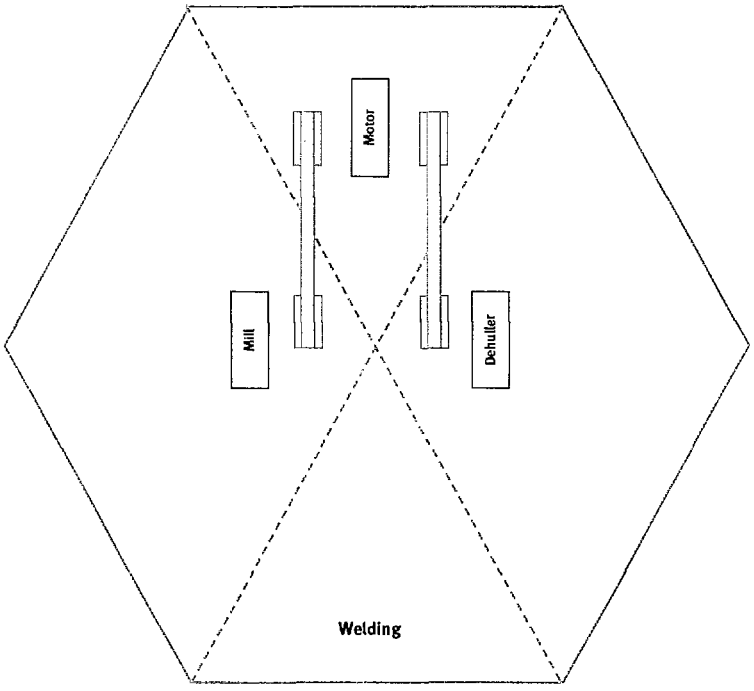
Motor
Mill
Dehuller
Welding

Motors

- In order that the buyers are aware of all potential options, a catalogue indicating brands, prices, qualities, potential disadvantages, detachable parts, address of importers, merchants, workshops, etc. would be useful.

- As the motor is the central piece of equipment on which all other equipment is dependent, special consideration must be provided to ensure the one chosen has the best possible potential for its planned use.

- Though the amount of initial investment is higher, in the long run, a good quality motor will be more cost-effective because of lower maintenance costs and repairs. Second-hand equipment has not proven to be a viable option due to high maintenance and repair costs.

- Entrepreneurs should consider availability and accessibility of spare parts when choosing a motor.

Information on the brands and types of motors used for the installation of village workshops can be made available upon request.

Mill stones

- Mechanised milling for processing cereals (millet, sorghum, maize and beans) into flour has been found most profitable. Women seem to prefer to pay for this service, since manual milling takes a great deal of their time.

- Experience shows that a second mill stone is often installed to optimise the operation.

- Stone sharpening is required on a regular basis. When the skills to perform this maintenance task are not available locally, this has been one of the major bottlenecks for the operation of the village workshop.

Crusher/grinder

- This machine is useful for the processing of germinated millet, peanuts and shea nuts, (which produces oil used extensively in cooking, and for making soap in Western Africa).

- Crushed peanuts provide a paste used in cooking. In Western Africa, this paste is a commercial product.

- Crushed millet is utilised for the preparation of dolo, a much consumed and commercial product in many villages of Western Africa.

Oil press

- Where nuts are a major agricultural product, the workshop should consider having an oil press. The demand for this, as well as the potential of it, appears to be great in Western Africa.

Hulling machines

- Past experience has indicated that these machines do not have a very good proven record. This may be due to the poor quality of the machines, which use a large quantity of fuel.

- Cereals, such as maize and rice, go through the hulling operations, before being milled. The hulled rice is ready to be consumed or sold.

Water pumps

- The major part of the profitability of adding water pumps to a village workshop may come from irrigation uses. The weak demand during the rainy season therefore should be accounted for in assessing the financial viability of this equipment.

- If the water pump for irrigation purposes is a central piece of equipment, the village workshop needs to be located as close to the fields as possible.

- For the introduction of water pumps, either as an additional or central piece of equipment of the village workshop, an in-depth assessment is necessary to determine the total investment cost. The analysis must include how much water would be needed, from where it should come, how much the equipment costs (pumps, canals/tubes, etc.)

- Advice is likely to be needed from agricultural experts on crops and irrigation, as well as from legal experts on possible tax issues.

Welding

- There is a great demand for welding machines based on an alternator. This allows for the production of a variety of local goods, e.g., windows, push carts, barrows, repairs to bicycles, etc.

- Despite the demand for this equipment, experiences show that the attachment of this equipment to a village workshop has not been profitable. This is mainly because of the lack of skills to put it into effective use.

- It is essential to ensure the availability of skilled potential users, or the provision of suitable training, before introducing this machine as part of the workshop.

Battery Charger:

- The charger is composed of an alternator and a regulator, often salvaged from automobiles.

- This service is in very high demand in many villages and is used for household and village social activities, e.g., to run televisions, radios, stereo equipment. It can also be used to generate lighting.

- Battery charging is a slow process – the speed of charging needs to be considered in financial calculations. In many cases, the demand has exceeded the supply. One solution is to install a multi-prong system to allow several batteries to be charged at the same time.

Electricity generation:

- Generation of electricity can be an income-earning activity. In various village workshops, electricity generators have been put to a variety of uses, such as lighting for homes, electrical machines, refrigeration, etc.

- However, experiences show that, in most of the villages, there is not a regular demand for its use and the purchasing power of the local population does not allow them to buy electricity for household use.

- The problems of utilising a motor of the village workshop to generate electricity arise from how the management of this service is organised. Some village committees have been disbanded because of internal dissent on how services are managed and how income generated by the services is controlled.

- In order to utilise the village workshop (the motor) for generating electricity, the economic viability of its operation should be assured. This depends on the ability of local communities to pay for the service.

The case for green energy

Green energy in relation to the village workshop could be considered for the following alternatives:

- Diesel fuel from pressed vegetable sources, purified through filtering and trans-esterification.
- Gasification of bio material

Jatropha curcas (Poughere) is a well-known plant, or shrub, in many tropical countries because of its potential multiple (industrial) uses.

The shrub may be planted as:

- a hedge to demarcate fields and reduce water and wind erosion;
- fencing of land;
- soil erosion prevention.

The plant produces inedible seeds that can be converted into valuable oil. The oil may be used:

- for production of (disinfectant/medicinal) soap, using both the oil and the sediment
- as seed cake that can be used as fertiliser;
- income generation activity by selling the seeds;
- as a substitute for diesel oil;
- as gasification of biomaterial.

Diesel fuel

One (1) litre of Jatropha oil suitable for the production of soap can be produced from four-(4) kg of seeds. This yields enough revenue to purchase two (2) litres of diesel fuel. As a consequence, the production of soap is relatively more important.

While the oil can be used as a diesel substitute, there are two main problems associated with this:

1) the number of diesel engines in rural villages is limited; and
2) there is an abundance of diesel available for those engines, therefore the market for the Jatropha oil is restricted.

Gasification of bio material

Waste material is processed by a gassifier system to produce gaseous fuel, which can replace fossil diesel by up to 85%. It has been proven that the installation functions in rural conditions.

In either case, the local price for diesel fuel will be a determining factor in the choice of options for production.

Sociological considerations

Empirical research conducted in Mali provides valuable insights into the social implications of growing and processing this plant:

1. Major users of the Jatropha seeds have traditionally been women (aided by children) who collect the seeds "free" from the fences found throughout the village. They press the seeds for oil to make soap, and use the seed cake for fertiliser. Sometimes certain village community organizations buy the seeds from them and then distribute to farmers who plant them for live fencing. This serves as wind breaks and erosion controls in the fields.

2. As the value of the Jatropha seeds increases, the male owners of the arbustes start to claim their ownership rights over seeds. The users, women, are now required to ask for permission to collect the seeds and are also expected to pay a percentage of their profits to the male owners. Jatropha plants are becoming more privatised and the seeds may no longer be collected freely by anyone passing by.

3. Usually, men plant the cuttings or seeds on land that belongs to them. This implies that only those people with permanent land use rights may cultivate this bush. In typical villages, however, the vast majority of the population is made up of land borrowers (particularly true of women, as they rarely have the right to own land). As a result, land borrowers may not plant the seeds or cuttings on borrowed land, because they cannot claim 100% ownership of the seeds produced.

4. Accordingly, despite the increasing value and demand for the seeds, there has not been a corresponding increase in production. This may suggest that once the women lose their rights to collect the Jatropha seeds "free", they also lose the motivation to gather the seeds, to process them and to make products from them.

In conclusion, any project considering the promotion of Jatropha should take due consideration of traditional patterns of growing, collecting and processing the seeds. This is important in order to keep the profits in the hands of eventual growers and users, i.e., women. One possible way to do this would be to encourage the allocation of a large tract of land to women for certain periods of time. This should be of sufficient duration to allow for the cultivation and collection of the seeds. This land could be sub-divided into individually managed plots, where women are the sole owners of the produce.

Notes for Governments, Donors, and Aid Agencies

Role of private sector to supply and service machinery

It is important to keep in mind that it is not the role of an appropriate NGO or government unit to supply equipment. There are two very clear reasons for mobilising the local private sector to supply and service machinery.

A. Institutional sustainability

In creating sustainable programmes, the reach of the project may in time become national in scope and it would then be beyond the capacity of an NGO or a government unit to supply and service machinery at this level. A lasting market for a village workshop is only created through increasing technical know-how and supply within a local setting.

B. Sustainability of the investment by the entrepreneur

Subsidised equipment is not sustainable. As a personal or group investment, an entrepreneur will ensure maintenance and maximum productivity of equipment that they have purchased, and from which they are making a profit.

Coordination with ongoing programmes

There are usually many development programmes already being operated by NGOs and governments in villages where the village workshop will be implemented. Because the village workshop has a potential to affect many aspects of village life, cooperation with existing development efforts is recommended in order to increase the impact of the current programme.

Governmental support

It may be possible to interest governments in supplying resources to cover the costs related to implementing certain infrastructure activities (such as digging of wells), but operation and maintenance of the village workshop should be left to the owners and/or local population. If such government assistance is to be considered, it is still advisable, for reasons of sustainability, to include replacement costs in the economic feasibility studies.

Research and Development Institutes

In order to develop safety, reliability, and cost-effectiveness of the village workshop, it may be useful to cooperate with research and development institutes. Although local industries can be a rich source of innovation, a structured effort to provide inputs will not automatically come from this source.

International coordination

UNIDO and IFAD continue to consolidate the knowledge and experience gained in implementing multi-purpose village workshops. This knowledge will be made operational and is available to interested parties.

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