



HUYS ADVIES

Client-Focussed Product Development (CFPD)

A Guide on Business Development



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The author has worked with TOOLConsult for the FIT programme (1993-1998) in several African and Latin American countries on the development of business development support (BDS) mechanisms.

A number of innovative small business development working methods and technologies were field-tested, improved and have become common knowledge through collaboration with the ILO and its Small Enterprise Development (SED) Programme and ISEP. The project was financed by the Netherlands Directorate General for International Cooperation (DGIS).



Products under this programme were:

- Entrepreneur Exchange Visits (EEV), Entrepreneur Training
- Rapid Market Appraisal (RMA), A Manual for Entrepreneurs¹
- Rapid Market Appraisal (RMA), A Manual for Trainers²
- Joint Tools Development (User Led Innovation-ULI and Participatory Tools Development-PTD)
- MSE trade shows and mini-fairs³, Road Shows
- Food Processing and Packaging, solar drying
- Brokering meetings, Private Sector linkages, Information and Networking
- Supporting and development of Associations

Originally the Farm Implements and Tools (FIT) programme focussed on the agricultural and food industry. This developed into small business support programmes. When TOOLConsult was taken over by other organisations, all the small enterprise products were further developed by the ILO under the **S**mall **E**nterprise **D**evelopment (SEED) Programme.

The author was Director of the Building and Construction Improvement Programme (BACIP) between 1998 and 2001, a project of the Aga Khan Planning and Building Services, Pakistan (AKPBS,P). The CFPD was applied in this project and replicated in Tajikistan projects as well. The several photos in this paper are from those projects.

This Paper

The current paper is based on several years of field experience in Pakistan, Nepal and Tajikistan (Himalayan countries) with the development of new products to improve the living conditions of the people in remote mountain villages.

Client-Focussed Product Development (CFPD) is the first phase before PTD and ULI. With less influence of the development organisation, PTD is the next development process; followed by ULI, which requires the least external inputs.

This document is based on high altitude housing in Himalayan countries and gives examples on the problem of space heating and cooking in particular. Other serious problems do exist in the same regions, such as lack of clean water and proper sanitation. The methodology explained can also be applied to other improvement technologies, generation of employment and training.

Themes

Micro and Small Enterprise (MSE), product development, Business Development Services (DBS)

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http://193.43.36.16/servlet/BinaryDownloaderServlet/44671_Document.pdf?filename=1165845724285_Rapid_market_appraisal_for_entrepreneurs.pdf&refID=44671

² <http://www.mmw4p.org/dyn/bds/docs/276/RMA-T.pdf>

<http://www.fituganda.com/manage/download/atm/manuals/RapidMarketAppraisalfortrainers.pdf>

³ <http://www.value-chains.org/dyn/bds/docs/276/Shows-Nzioka.pdf>

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1. INTRODUCTION

This paper relates to Micro and Small Enterprise (MSE) and describes the development of new products based on the needs of villagers living in under-developed areas.

The methodology entails technical project staff assessing the needs of these villagers through interviews. The technical staff needs to not only have knowledge of innovative products from other economic zones, but also have the capacity to adapt these products to local circumstances, be creative and develop new ideas. Ideas for innovation are to be planned in coordination with local entrepreneurs, and new materials or combination of materials should be discussed with these entrepreneurs.

The perceived needs of the villagers are also based on environmental considerations and have as objective to reduce the high-energy demand of the villagers, which currently causes an almost irreversible deterioration of their environment.

Many villagers do not immediately see the possibility or need for changing their habits. Outsiders, however, can observe the environmental deterioration and inefficient time management preventing them from becoming more productive or reducing the large amount of drudgery work by men, women and children.

Client-Focussed Product Development (CFPD) brings the development organisation (DO) together with entrepreneurs from productive, small-scale enterprises and their clients to develop more marketable and appropriate products that improve the quality of their life.

Introduction of products from elsewhere, retro-engineering and re-engineering are part of the process.

The final effect of CFPD is the development of local production of essential goods, such as house improvements, creating some income generation and reducing the dependency on expensive imported goods having the same effect. To achieve sustainability, however, implementation must be both imaginative and business-like without the need for constant donor agent-driven subsidies. This document presents some of the developments to date, describes how to replicate the process and suggests possibilities for future improvements.

1.1. Target Group of this Publication

This paper is aimed for development organisations (DOs) and associations of MSEs in order to promote the creation of employment related to poverty alleviation and the general improvement of living conditions, such as will be achieved by house improvements. It will assist development organisations in clarifying the focus of the development of local business and service providers and the interaction needed between the private sector and local government. Since development agencies need to operate more in a business-like manner, this document explains the commercial opportunities and limitations for private-sector development.

This paper reflects on the experiences of action research, products need to be tried, modified and refined in a collaborative working agreement until these are fully accepted for purchase by the village clients. Continued action research for the further development of the products will be necessary to serve better the interests of the client population and improve their lives. By serving the client population, the MSE will also develop and create sustainable business.

Employment creation and income generation is only sustainable when local entrepreneurs are capacitated in the delivery of new products to the village population. Poverty alleviation is supported by new and better products that reduce wastage of resources and time, or save the villager money. The key factor in this process is the final client (the villager) who should see the benefit in purchasing the product. The local village-based entrepreneur is the intermediate client of the DO requiring different types of support.

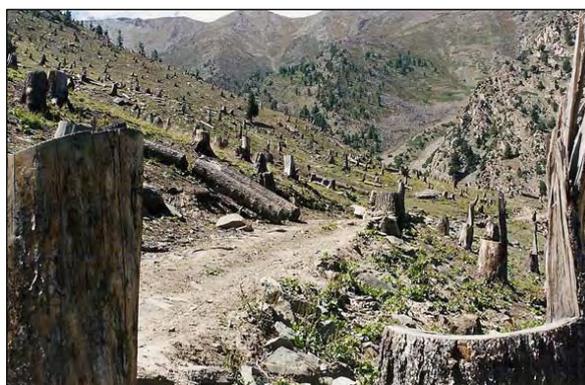
2. BACKGROUND OF CFPD

Low-income people do not have the monetary resources to purchase energy (firewood) for cooking and space heating. They depend on laborious scavenging of firewood and other biomass, such as cow dung, preventing them from making better use of their time and at the same time deteriorating the local environment in ever-wider circles around their villages. Soil erosion, accelerated by overgrazing and finally total desertification are the results affecting entire communities and their food production ability. Only by substantially changing habits, combined with strong communal action, can these trends be reversed. However, for changing habits, alternative technologies and products must be available. The CFPD assists in the development of these products and tries to manufacture the products locally, while at the same time it looks at the constraints for changing behaviour. Changing behaviour includes the willingness to purchase the new products at cost price, thus creating a sustainable supply.

Timber is needed for construction and firewood for cooking and keeping the houses warm.

With a growing population, the demand for timber and wood increases, but new plantations are not being developed.

At high altitudes, biomass growth is slower than at lower altitudes while the consumption of fuel for heating and cooking is higher.



Above 3000 m altitude, heather-like bushes with their roots are collected for fuel (Treshkin), but these bushes require 20 years to mature and the main food source for yaks.

For many kilometres around the villages, the land is devoid of all biomass (trees and bushes), leading to soil erosion and increased water run-off.

The burning of cow and yak dung leads to further soil degradation and less re-growth of grass for grazing, reducing income from cattle.



Poor building insulation causes large quantities of fuel to be consumed for space heating; new constructions are often far worse insulated than traditional housing.

Cooking and bread baking is also very inefficient in firewood, the whole year through.

Large CO₂ emissions exist because of space heating.

The combination of these many factors leads to climate change and increased poverty.



Since the building industry accounts for 25% or more of all village people's time occupation and employment, this is an important area to develop for new products and new employment generation.

3. PTD AND CFPD

Participatory Technology Development (PTD) assumes that under the guidance of an external agency, villagers and local entrepreneurs can develop their own technologies to better meet their own needs. This is possible in large urban environments where entrepreneurs have ample access to information and source materials, but in remote areas this is seldom the case. Low-income villagers and village artisans do not have access to information (internet), capital (banking) or technology and tools to produce new items that will improve their way of living.

PTD implies that the external agency only explains the process, leaving the village entrepreneur and the villagers to develop a new technique or product together. User feedback and comments from the DO will lead to further improvement of the product or lower costs. Without access to materials, tools and technology, this is not possible.

CFPD follows this main principle, but the external DO introduces the new technical elements, such as materials, tools, construction design (drawings) and manuals, to the entrepreneur and supports the entrepreneur in marketing and changing client behaviour. The DO, through CFPD, puts emphasis on developing local services by the MSEs so they eventually will become self-sustainable.

The clients (villagers) contribute in the development through their acceptance of these new products, mutual enthusiasm for their use and by purchasing the items.

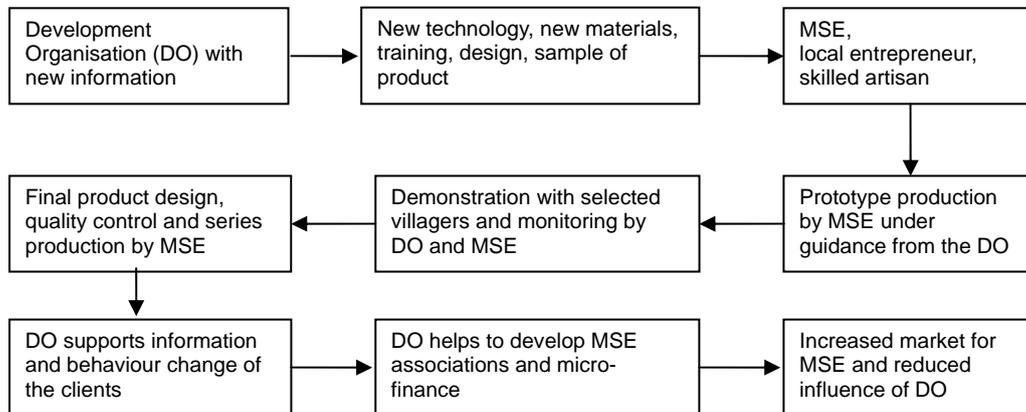
The new product and its sale cycle is the key element of CFPD, leading to generation of local employment. In nearly all economies, the client (villager) expects a product to provide the following benefits (in order of importance from high to low):

- Leads to an increased comfort level, such as a warmer house, availability of warm water, less smoke in the house, no draft from windows, etc.
- Leads to a better status because the product is purchased by the wealthier villagers (usually more intelligent and able to immediately see the benefits), while still being affordable to low-income households.
- Leads to lower recurrent expenditure, meaning that the product is a good investment with the cost of the product being recuperated by its use. For example, when the villager needs to buy less firewood.
- Leads to lower expenses in terms of health or medicines, which normally are needed to offset the problems related to existing products. Clean water supply reduces intestinal diseases, less smoke reduces eye and lung diseases, warmer houses reduce colds and rheumatism.
- Leads to less time wastage of the family members, such as in collecting firewood or water.
- Leads to improved general health due to sleeping better, less harmful smoke in the house, reduction of chronically weakening medical ailments (intestinal diseases, colds, influenza).
- Enables use of the saved time. This should be facilitated by the development organisation, but commonly more quality time will be spent on upbringing the children.

The more demand for the products, the better the MSE can operate, and the MSE becomes more responsive to the particular demands of their local customers. DOs and local governments need to be sensitive to the needs of these MSEs to increase capacity, be it in terms of training, marketing technology, capital or transport. The DO needs to constantly adapt its communication methods and tailor their services to these MSEs accordingly. Entrepreneur Exchange Visits (EEV), vocational training, association building, marketing information and facilitation of local legislative framework may all be part of such a process. In this respect, the MSEs are the intermediate clients of the development organisations. The villagers are the primary clients.

3.1. First the Product, Then Employment

In regions with a large unemployment rate, DOs and the local government will need strategies to create more employment.⁴ Employment, however, is only guaranteed when MSEs can produce items and services that are demanded by the population.⁵ Employment may be an indirect result of a planned action, but increased demand for local products and services is the basis of the development cycle.⁶



MSEs are operating in the villages and already provide services to their clients. Because of the existing entrepreneur-client relationship in the villages, the villagers are often better reached through these entrepreneurs than by new people from outside. The DO therefore should work through these local artisans when possible and when they are willing to engage in the production of new articles.

Because most villagers do not know what is available in the world market or what improvements can be realised, they take advice from the village artisan. The DO, by providing the local craftsman with new information and training on new products, therefore improves the number of services the village artisan can provide to its neighbours.

Village MSEs should develop the capacity to manufacture products that increase the comfort level and lower the recurrent costs of the villagers. The DO, by introducing new and beneficial products with selected villagers, stimulates demands for the products through the MSEs. The CFPD model is based on demand generation by the clients of these new products. Four basic steps are essential elements in this process:

- (a) Supply of detailed information.
- (b) Awareness raising by demonstration in the village.
- (c) Motivation through accessibility and more detailed information.
- (d) Purchase of the product or services.

The DO therefore needs to be able to support the clients in these four steps. The entrepreneurs involved need to be supported towards self-sustainable operation in the areas of purchase of materials, quality control, series manufacturing, advertisement, guarantee services and general small enterprise operations, including bookkeeping and administration.

Training is an essential element of this new product cycle, but not an aim by itself.

⁴ Increasing bureaucracy will provide more employment, but is not sustainable because it does not necessarily increase productivity.

⁵ Although many people want products that only enhances their status, products having no other beneficial elements are not included in this paper.

⁶ In particular, bulky products are suitable for local production because the transport costs will increase with distance. Housing elements, including furniture, are such examples.

4. THE CFPD PROCESS STEPS

- I. Identification of general needs of the population in comparison with other, more developed societies. The identified needs are related to the Human Development Index (HDI) and the eight Millennium Development Goals (MDG). Although all of the MDG are important, emphasis is given to environmental issues and how MSE (and employment) can help to resolve the problems identified.

- A. Low-income communities depend on firewood and biomass scavenging for cooking and space heating. In the fragile mountain environments, the consumption of firewood and biomass (dried dung and heather) is much higher than their growth. This difference increases with the altitude since the colder climate requires more heating and the biomass grows slower. The result is removal of all biomass and fertilizer (dung), reduced water absorption, soil erosion, less crop production and less food, landslides, floods, desertification and finally climate change, which will aggravate the effects. This results in a negative spiral resulting in more poverty.
- B. Large population growth results in an increased demand for housing. When the economy is not improving and land and building materials are becoming more costly (scarce), the building quality goes down, resulting in lack of earthquake resistance and reduced thermal insulation.

- II. Identification of the basic causes that result in the poor living and housing situation of the population. In relation to the environmental degradation, these causes are rather obvious, but it is the low-income people who do not have the individual means to adjust to the situation or to change their behaviour.⁷



- A. The high consumption of firewood (cow dung) requires increasing amounts of time in collection (20 hours/week and more), resulting in low productivity and lack of time for reproductive activities such as child education.
- B. In some districts, women are not allowed to leave the house for long periods, resulting in the need to purchase fuel and an increasing demand on the available household budget. In some cases, low-income people cannot bake bread more than once a week and are unable to heat their houses to keep out the frost.
- C. Smoke from poor quality and inefficient cooking and space-heating stoves gets into the room and negatively affects the people living in the house, causing increased vulnerability to eye and lung diseases and colds.

⁷ The depletion of natural resources and environmental degradation is the combination of an increasing population without improving the population's economy or providing technologies/resources to offset the over exploitation of the natural resources. To obtain long-term and sustainable solutions, both population growth reduction and the introduction of better technologies are necessary.

III. Identification of possible technical solutions towards reducing the increasing demand for local resources within the economic means of the local population. The availability of materials, tools, skills, transport options, feasibility of importation, finances, behavioural change and sustainability have to be taken into account.

- A. Improving the thermal insulation of houses (closing open holes in the roof and improving roof/wall insulation) is technically the most important method to reduce heat loss from the house and with that reduce fuel consumption.
- B. Improving the efficiency of the firewood space-heating and cooking stoves (ICS) is the second most important method, but people believe that improving the stove is more important than insulation as it is the heat source.
- C. Improving the cooking equipment and methods is the third method, but involves substantial behavioural change (pressure cooker, heat retention bag, solar box cooker, communal bread baking).

IV. Identification of local entrepreneurs who are willing to work on new prototype products and think together with the DO in resolving practical problems related to technology, tools, skills, importation of new materials and the possibilities of series production.

- A. Although local entrepreneurs are often willing to manufacture new products, some immediately modify the new idea because they are stuck with old production processes, such as the one-at-a-time production. Changing their manufacturing method is often more difficult than introducing a new product.
- B. Artisans often have difficulties working with two types of materials (such as a carpenter working with steel), but combinations are often necessary for the improved products. Working together with other specialized entrepreneurs to optimize each other's skills and production capacity requires changing their business relationships and working methods.
- C. Planned associations between entrepreneurs who produce different components or realise different steps in the production process (such as prefabrication and assembly) are unknown.



Many MSEs make one individual product after the other and are unfamiliar with series production to lower production costs.

The DO needs to include professional training and tools for speeding up the production process and with that keep the unit cost low.

- V. Manufacturing of prototype products and field-testing these prototypes in the houses of the more intelligent villagers. The possibility of easy installation must be developed and their effect on the household needs to be measured, as well as the effect on the environment.

- A. Because the effects of the products need to be closely monitored, intelligent villagers are preferred, sometimes being the same entrepreneur. Direct monitoring by project staff is costly and not sustainable. Demonstrations in locations where the effect cannot be measured under user circumstances are not useful as it does not provide arguments for future clients.
- B. Some products only work when installed in houses (stoves, double windows, wall insulation). If the innovating house owner is satisfied with the product, other villagers will follow. Choosing the right villager and ensuring that the product works well in his/her house assures free advertisement. The in-house construction needs to be realised by the village artisan.
- C. In product development, it is essential that the product performs as good as promised. In the follow-up, the prototype can be exchanged with a model that also looks better. The villager trying out the prototype should be able to obtain the final product version.



With the first prototypes, the local village organisation decided that the model improvements were to be installed in the house of the poorest family; the idea being to benefit these poor people.

Although these families were very happy with the improvement, they could not maintain the product (broken glass) and could not explain why it saved firewood.

More important was that the poor people could not invite visitors into their house. The most crucial lesson learned was that people who can afford to pay for the product will not buy something that was designed for poor people. Demonstrations in houses of poor people works counterproductive.

- VI. Obtaining feedback from entrepreneurs and households for improving the product, adjusting the design for series production, alternative product options (luxury designs), quality control and post-service installation. Develop Do-It-Yourself (DIY) products as lower cost options.

- A. Clients want a choice of different options. Even when an extra large or small option is impractical and people seldom buy that option, it still needs to be offered as a choice. The availability of a DIY option is important in this respect. The entrepreneur should realise that people with less income will often go for the DIY option to save money, as compared to the artisan-installed option, or nothing at all.
- B. The entrepreneur needs to be able to facilitate the DIY option through supplying the necessary materials or fittings, along with a DIY manual. In addition, the provision of a little practical assistance or demonstration can be supplied as a service.
- C. Consumer feedback is important to enable refinement of a product. This feedback and improvement cycle is continuous, such as when new materials or technologies become available or the entrepreneur has obtained better equipment or pre-worked supplies. After several years, the extent of maintenance the client undertakes will become evident and what that means for the product design; a design modification may then be necessary.

- VII. Development of associations of entrepreneurs with a sustainable supply line of the essential materials, distribution, manufacturing of parts, assembling, transport, delivery and in-house installation.

- A. Because some of the components of the improved products come from far, such as major industrial cities or imported, larger town entrepreneurs need to be involved. They, in turn, need an assured sale to a larger cluster of manufacturers to justify the importation in bulk (lower cost).
- B. Because village artisans do not have large machines for mass production, an association can centrally mass produce certain components and organise local assembly and in-house installation. An example is planed and profiled timber. The carpenter does the assembly locally according to the required size. This will reduce costs and labour time due to mass production, lower transport costs and speed up client delivery.



Associations of MSEs can bring in bulk supplies from larger towns and organise onward transportation to several village artisans (photo). This will substantially lower transport costs and the final purchase price.

MSEs need to be made aware of these options and overcome their resistance towards working together for better products.

- VIII. Develop manufacturing manuals, product information, DIY instructions, demonstration and advertising elements for entrepreneurs to use in their marketing and promotion. In general, village entrepreneurs do not have the capacity to develop such support products.

- A. The DO needs to provide sample marketing materials that MSEs can use or adapt for their own products. In addition, basic training needs to be provided for local artisans about what is the best message to convey and how to convey those messages.
- B. Individual MSEs do not have the equipment (computers) or skills to develop leaflets, videos or DIY manuals for market promotion or client assistance. An association of MSEs selling the same products, such as thermal insulation, can contract an outside town artisan or video company to produce these.



DIY articles with instruction manuals are economically feasible, but MSEs are unable to produce the DIY manuals or market the idea by themselves.

- IX. Develop micro-finance mechanisms for clients who want to buy the products and for entrepreneurs who need production capital. These micro-finance mechanisms can be based on village Saving and Loan Schemes (S&LS) that are indirectly supported by the DO in training and the establishment of linkages with larger micro-finance institutes.

- A. Commercial small loans often have interest rates of 1.5%/month because of the high administrative cost and the perceived risk by the lending organisation. S&LS have lower risks, while clustered village loans have a larger turnover, both reasons to allow lower lending rates between micro-finance banks and village-based S&LS.
- B. The cost of client assessment and establishing the credit should not be incorporated in the interest rate, but be charged separately and recovered with the down payment. This way the interest rate remains low.
- C. Products that reduce recurrent expenses, such as fuel and health costs, pay for themselves. Some very large volume products can generate Carbon Credits. Special rates can be developed for these environmental products.

- X. Phasing out the support of the DO by educating the entrepreneurs on how to do their own marketing and strengthening their associations in the development of the marketing support products. The association of entrepreneurs should also be able to diversify its products and, following interaction with the client population, design new products as needed.

The development cycle never ends with just one product design. With improved local economy, people will want better or more sophisticated products. New materials are constantly becoming available in the local market.⁸ It is necessary for entrepreneurs to understand this process of product development. The association of entrepreneurs can eventually identify new materials, product variations or products to expand their market.

4.1. Product Modifications

Clients in the villages usually work together with the local artisans in the installation of house improvements and through this process give feedback to the MSEs from whom they have purchased the products or services (skilled labour). A client may even demand a modification to the design because he/she thinks it will work better. The artisan must understand the consequences of such a change before he agrees to make the modification. This requires theoretical education of the entrepreneur about the technology and the working of the product. In some cases, the input from the villager may lead to a useful variation and even a new product, but in other cases, the modification may work negatively.

- A. A client may not want a vapour barrier in a ceiling or wall insulation. The effect can be that with outside frost, condensation will form inside the construction, eventually destroying wooden structural elements. In such a case, the artisan should have the knowledge to explain the risk to the client.
- B. A client may want an incorporated water tank on the stove and is prepared to pay for a stainless steel unit. If she pays for the extra cost, it may become an additional (new) product for the MSE.

Experience has proven that clients are willing to pay additional costs for services increasing their comfort, whereas MSEs will produce these modifications, often using their own extra time for free, when they think the new product will be sold to others as well and become profitable.

⁸ An example is the availability of reflective foils for thermal insulation. These foils were unavailable in year 2000, but when they became available in 2010, the thermal insulation technique made a forward leap. The same will happen when insulating ceramic liners for stoves become available.

The entrepreneur depends on the client for payment for the products and, therefore, is inclined to make adjustments to the product according to the clients wishes. The client sometimes comes with a ready solution in his/her mind and forgets its objective, e.g. space heating.

A client wants his house to be warm and according to his logic wants a better space-heating stove. When he was young, he sat next to the stove to warm up.

A. A client wants a new stove, but is unhappy with the smaller burning opening of the new stove design and desires a much larger opening for loading the firewood. The effect will be that the heating efficiency of the stove will go down and less firewood will be saved. The seller of the stove should be able to explain the differences and alternative options, since the larger firewood opening does not provide better space heating.

B. It is more cost efficient for the client to insulate the room, so less heat is required. Because thermal insulation by a carpenter will not generate business for the metal stove seller, he might advise a metal heat exchanger, which will increase the overall efficiency of the current space-heating stove by 30%. However, the stove seller should also be able to explain the alternative options to the house owner, along with the advantages and disadvantages.

Although User Led Innovation (ULI) can be a contribution towards better products, good knowledge about how the products work is essential. That knowledge needs to be taught locally to clients and the entrepreneurs. Teaching entrepreneurs is more cost effective for the DO than trying to educate the entire population.

4.2. Awareness about Different Products

There are often different solutions to the same problem. Educating the client population is important to allow him/her to make the best choice for the money available. Such an educational process is not possible for an MSE and will need to be realised by the DO and local government. This means collaboration between the local authorities and the DO in the production of information formats, reproduction and additional information support.

Posters, leaflets, radio programmes, drama and video CDs are all means of providing information. The DO should look for ways of cost sharing to produce them.

Village organisations also can play an important role in explaining the advantages and disadvantages of each product, but they should not have a stake in the sale of a certain product. The provision of information material to these village organisations is again a task of the DO and the local government.

INFORMATION AND CHOICE

When made on purchase price only, a good decision can not be made.



low price (USD 2)
Cotton shirt, fashionable

Very little insulation value
easy to wash and wear.

Will last about one year



Medium cost (USD 5)
Woolen sweater

Good insulation for in house
but does not block the wind

Will last about two years



High cost (USD 10)
Very good thermal insulation
Also for outside in the icy wind

Will last about 10 years

Information should explain the different options to obtain a certain result.

The options will vary in cost and results, as well as have different advantages and disadvantages.

5. DEVELOPING AND DESIGNING THE PRODUCT

Focus is needed before bringing MSEs together to plan about the product lines. The DO needs to have an overall picture about how the programme will work. After a brainstorming session, a list of the various aspects can be made.

In this example, several aspects come together:

- Employment, youth, income generation, entrepreneur development.
- Environmental degradation, soil erosion, climate change, CO₂ emissions, cold houses.
- Shortage of energy resources, cost of firewood, cow dung, diesel, kerosene and gas.
- Disadvantaged position of women, firewood scavenging, cooking in smoke, illiteracy.
- High cost of living, frequent medical costs (colds/lung diseases), less energy due to cold.

Based on the above list, a brochure (factsheet) can be made outlining the goals of the programme to inform potential stakeholders and local authorities. The programme budget will be a limiting factor in the number of activities. From the onset of the programme, it needs to be explained that participation of the partners will be required. The introduction meeting is important to sensitize these other stakeholders towards their participation and share in the benefits.

The following questions need to be answered in an early phase by the DO:

- ☞ What market is being targeted (carpenters, masons, furniture, transport, plumbers)?
- ☞ Who will participate in the production (artisans, end-users, traders, local inspectors or technical advisors, village organisation, training staff, micro-finance banks)?
- ☞ How many people should participate (one village, valley, district)?
- ☞ How many products should the programme start with (windows, doors, walls, roofs)?
- ☞ How many variations of each product should the programme begin with (small, medium, basic or extra)?
- ☞ What type of cost-sharing arrangements will be required (training, information)?
- ☞ What role will external suppliers of raw or pre-manufactured materials have and how to deal with them (importation to the region, credit, associations, transport)?
- ☞ Will materials for prototypes be financed by the development organisation or will the MSE and its clients cover these costs (if not, what will be the financial support)?
- ☞ How will the final products be marketed, what network is going to be used, how will this network be set up, and who will cover the costs?
- ☞ How is the programme going to be expanded to other areas (EEV)?⁹

Minimizing subsidies and starting cost sharing right from the beginning is essential, also for developing and marketing the prototypes.¹⁰ For the final product, no consumer subsidies should be allowed. The house owners who need to field-test the products are required to monitor and report back to the manufacturer and DO. Fill-in formats (charts) and equipment (scale, thermometer) need to be provided. Training is required to facilitate such periodic feedback. It is far more cost efficient for the client and local MSE to do the monitoring than for the DO to drive around in 4WD trucks with driver/staff and incurring overnight allowances to collect such information.

The first CFPD meetings should be with the local development partners to create awareness and obtain some cooperation from these intermediate stakeholders. As a first market analysis, their opinion about the possible products should be heard and the quantities or volume of production can be estimated as an exercise during the meeting.

5.1. Support and Participation

MSEs who are selected for making the prototypes need support from the DO in the supply of designs, drawings, special source material, tools and guidance. In many situations, direct support is needed to explain new designs to local artisans since they are not familiar with the suggested new constructions and materials.

⁹ Entrepreneur Exchange Visits is one of the FIT training modules.

¹⁰ In the PTD and ULI methods, the contribution of the stakeholders will be higher.

The initial supply of the new materials needs to be organised by the DO and the manufacturing of the new product needs to be explained and supervised to ensure the correct application and overcome possible manufacturing problems. This, of course, requires that the DO has the necessary technical staff with knowledge of new products, production techniques and processes.



Either new materials can be found in the markets of the larger towns or existing material can be used in new configurations or applications to make a better product. Left: Reflective foil with PE backing.

Being at the artisan's workshop to supervise the manufacturing of a new product is often necessary because whether a product works or fails often depends on small details. Left: Making a new model heat exchanger. Right: Adjusting a detail on a roof window.



In these supported product development activities, the MSE involved needs to be prepared to spend non-paid time in producing the product, whereas the materials are supplied or paid for by the DO. In some cases, the DO needs to demonstrate special tools for faster production. The supply of tools, however, should be against cost price; the MSE paying back the cost of the tools from the sale of products. This is especially the case when expensive equipment is needed, such as large machines for series production.



Small hand-operated rolling machine for quickly making sheet steel joints. While machines increase production and can deliver more precise work, their purchase cost needs to be recuperated from increased sales numbers. Large machines can be used by one MSE to supply prefabricated parts to various other MSEs to create a better turnover for the recuperation of the purchase cost.

When entrepreneurs and other organisations contribute time and resources to the CFPD project, they are likely to be more committed than when everything is free. While all stakeholders will contribute their time, participation in hardware and budget will increase ownership towards the project. In many cases, the small village entrepreneur can pay his own travel cost to participate in a learning exercise and can stay overnight in the larger village with acquaintances or family. MSEs need to understand that development costs are involved for new products and learn what possibilities exist to share these high expenses. Eventually the association must be able to organise innovation in a cost-effective way without the support of a DO.

The involvement of traders (private sector) is important for bulk transport from major industrial cities and payment procedures.¹¹ Traders or merchants are often willing to supply the materials or tools needed for the manufacture of the new products as long as they have precise description of these tools and materials. They might even be willing to provide a small quantity of materials for the prototypes at a reduced cost for bulk supply. Large-scale retail stores may be interested to help market the new products when they understand that sales will probably pick up.



In the beginning, the project itself purchased the essential materials from larger towns. MSEs then started to import these materials and make their own versions of the product. Several new products, like insulation material, are now available from many shops.

5.2. Holding a Collaborative Workshop

After defining the principal outline of the project with the potential development partners, a workshop needs to be organised between the potential clients and the MSEs.

The workshop should include the following goals:

- ☞ Explain the objectives and the functions of the programme and the expected benefits for the population as a whole.
- ☞ Explain the objectives and the functions of the new products and the possible short-term or long-term benefits of these products for the clients.
- ☞ Identify the short-term and long-term volumes of these products and the possible cost recovery period.
- ☞ Identify what the quality standards would be for the clients and how much the clients would be able to pay for such products.
- ☞ Identify which of these products the local or village entrepreneurs can produce and what obstacles they face in trying to produce these products.
- ☞ Promote new linkages between village and larger town entrepreneurs, traders and transporters.

The first objective of the workshop is to get the communication process going between possible clients and artisans, and between different types of artisans and transporters, to establish or improve informal relationships. The final objective of the workshop would be that MSEs start their own innovation process through these business linkages.

Whom to Invite?

Metalworkers, carpenters and masons are the artisan MSEs, but traders and transporters are part of the production and delivery process. Resource materials and tools need to be transported from the bigger towns/cities, and materials and pre-fabricated components need to be transported from local towns to the villages.

Extension officers, information producers, training organisations and micro-finance organisations can be part of the collaborative workshop.

The selected clients would be members of village organisations, which by definition are the more influential persons in the village. Women need to be specifically encouraged to participate, as they are usually the users of the products in the household.

¹¹ In Pakistan, payment of services and good to and from distant towns are financed through informal banking systems, being operated by the transport companies.

Since the number of potential clients will be large, several workshops can be held for those dealing with a particular valley. This implies that some of the same town-based MSEs may attend a few workshops. A workshop maximum should be about 30 persons (= about 40 invited).

CFPD does not imply that the new (innovative) products are entirely new. They might be unknown to the local market, but can exist in major cities or in other countries. Some advanced villagers might have very good products brought from afar that can be produced locally. Village organisation members should be encouraged to bring or explain examples of good products they know and would like to see locally produced.

In a village house, an excellent heat exchanger and bread oven was found, but the product was not available in the market. Because of the high potential of this product, an improved design was made and locally manufactured.



Adapting Existing Products

There are many advantages to adapting existing technology to local conditions.¹²

- √ Products which have been marketed in other places have already been tested.
- √ The effect of the product is known, only new materials and designs are required.
- √ There may be documentation on low-cost production, including designs.
- √ When the DO can provide samples or at least drawings of products which are new to an area, they can be evaluated by the artisans and clients during the workshop.
- √ The users of the imported product can give an account of the usefulness.
- √ Other potential clients can tell whether or not they like the product.
- √ Local artisans can give an opinion whether or not the product can be copied.
- √ The importation cost (to the region) and local manufacturing cost can be compared.

The collaborative workshop also functions as a Rapid Market Appraisal (RMA) activity.¹³ All the participants are also clients themselves and can reflect on the market potential of a new product and/or what they prefer it can do. The women participating in the workshop can reflect on practical issues, such as cleaning, storage, child friendly, durability, etc.

Some products require behavioural change and change of attitude. Examples are cooking and sanitation. These new products may receive strong resistance, since people do not easily want to change their habits. An example is the solar box cooker, which requires a change in cooking habits, but saves large amounts of fuel on an annual basis.

An additional problem of the solar box cooker is the relatively high cost to make a durable, good-looking design; thus causing a long cost-recovery period. A design that does not look good or has sharp edges will not sell. An operation manual is also required.



In the case of the solar box cooker, the local gas bottle seller was interested to include the item in his shop, as it replaces gas consumption. This way, his financial turnover will continue to grow once the solar box cooker becomes popular. Although the prototype solar box cooker worked reasonably well, the project was unable to produce a good-quality design with a local cooking manual suitable for a shop outlet.

¹² In some economies, nearly all new products are copies from elsewhere existing products, including high-tech products, saving research and development expenses. With less transport costs and lower labour costs, they can be manufactured locally, generating employment.

¹³ For a full explanation of the RMA, see other existing documents.

Workshop Outline

When village people with their village artisans come from far, a two-day workshop will be necessary, allowing the villagers time for arrival, departure, shopping and meeting friends. Since town-based MSEs do not have time during the weekdays, the workshop can be organised during evenings. The setting of the workshop should not be too far from the local MSE environment. A general schedule for a one- or two-day collaborative workshop between clients and MSEs is:

- Introduction of participants and what is expected by the participants themselves.
- Explanation of the programme by the DO.
- Exercises to help MSEs and clients to understand each other's needs.
- Group work: small cluster exercises to document needs/constraints.
- Presentation of sample products or drawings brought/explained by the DO.
- Presentation of first observations and suggestions of and by the MSEs.
- Feedback by the village clients and others.
- Explanation by the DO on the relevance related to the project objective.¹⁴
- Selection of the main focal areas of new local production.
- Identification of problem areas in clusters of MSE and clients.
- Planning of what should happen next.
- Definition of responsibilities in the next phase. Other development partners can play a role in research, different MSEs can do manufacturing prototypes and clients can commit themselves to monitoring and reporting on the products.
- MSEs should fill out a format with basic details about their enterprise, such as location, product range, available machines, number of staff and problems.¹⁵
- Evaluation of the workshop by the participants.

Lunch and tea breaks are very important aspects of the workshop because they allow people to exchange views and information informally and get to know each other. Issues raised during the course of the formal discussions can be followed up and experts can be consulted individually. Ample time for socializing should be scheduled. To facilitate the socializing, participants should wear large letter nametags. Colours can be used for the different categories, clients, MSEs or DO.

Ideally, a second promotion type of workshop should be held, once the DO and the MSEs have made a good working prototype. If the prototype is too large to bring to the workshop, either part of the workshop should be held where the prototype is installed or transportable models need to be provided.

This second workshop should be much shorter than the first and have a single objective – to stimulate marketing and obtain orders. It will allow the client to give an opinion for (personal) modification or preferences (size). Cost indications should be worked out during this workshop, including transport and installation costs. The cost indications will demonstrate the willingness to pay for the products by the clients.

New products, such as thermal insulation, need to be demonstrated in such a way to allow the clients to see how it is applied and what the various finishing options can be. Clients often want a DIY method and work together with the village artisan.



Stimulate Communication

- ☞ Classical seating arrangement should be avoided; a circle setting will create a more equal atmosphere and encourages participation by all. Participants should feel at ease.
- ☞ Resource persons from the DO should not outnumber the MSE or clients.
- ☞ Possible disturbances should be minimized; mobile telephones switched off, but indicate that during the tea breaks people can use their mobiles.
- ☞ Use local language for communication, so villagers can follow the discussions.

¹⁴ When the project objective is the environmental degradation due to large firewood consumption, clients often think in terms of a better stove; however, the objective can only be reached in a durable way by thermal insulation of the houses. Stoves are a secondary improvement.

¹⁵ MSEs do not always want to expose their problems in a group, but sometimes the DO can assist.

- ☞ Include Question and Answer sessions after every theme and stimulate clients.
- ☞ Is the building quiet and comfortable, well ventilated or warm enough?
- ☞ Are toilets sufficient in number, clean and easily accessible?
- ☞ Are arrangements for tea breaks adequate and do they allow for informal discussion?
- ☞ Is walking or transport to the lunch/dinner break organised and with sufficient time?
- ☞ Availability of some writing material and cards to post general comments.
- ☞ Ensure audiovisual material is tested for presentation before the workshop begins.
- ☞ Do not present videos or PowerPoints with long texts or more than a few figures.
- ☞ Show mini-models to explain the principles of what the objective.

Needs and Constrains

To obtain maximum participation from the MSE, their needs and constraints should be resolved through the project implementation. Although the MSE may not want to discuss internal problems with clients or local government people present, expressing general problems is a step towards resolving them.

The participants need to be divided into small groups of four or five. Groups can be by type of profession with a mix of clients and the DO. This will be the best way for the MSE group to assess what constraints their profession faces and how they can be resolved through participation in the project. Suggestions on new resources, including tools, training or finance, could be made.

Next, the discussion is switched.

The MSEs now need to guess what the clients would most like to have and how much these clients would want to spend on a product.

Then another switch.

The clients should have a chance to tell what they would like the MSEs to make, what new materials should be used and what guarantees need to be provided.

The group can subsequently discuss certain selected products:

- Ease of application, DIY option, obtaining materials and tools, ability to transport in small vehicles and over difficult mountain roads, hand carrying.
- Can tools be borrowed from the MSE for DIY application? What conditions?
- Durability and aspects that determine durability.
- Operational costs, spare parts, time involved, attachments.
- Affordability and cost recovery period, linkage to S&LS at the village level.
- Maintenance requirements, including where the product can be repaired.
- Finishing, available materials, where it can be seen.
- Usefulness – how much time or effort is saved by using this product, health aspects.
- Flexibility – can the product be used for more than one function?
- Who would like to purchase the product (including MSEs, being also clients themselves)?
- Who wants to participate in manufacturing the prototype?
- Who wants to monitor the use of the product and report to the MSE and DO?
- Possible cost reductions with large series production?¹⁶

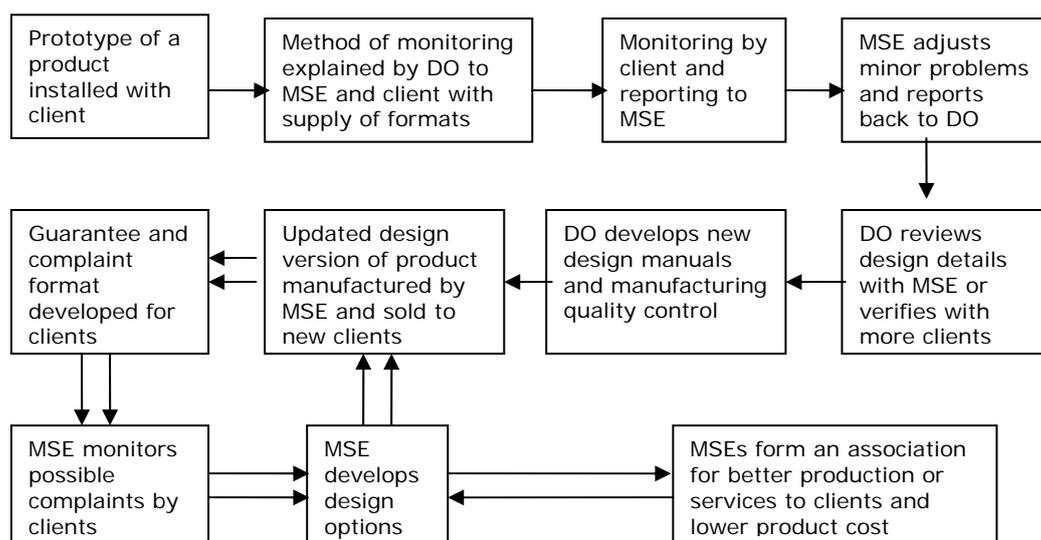


Material preparation can be centrally organised, whereas assembling can be done locally; thus reducing waste, economizing transport, reducing damage and providing faster delivery.

¹⁶ Industry experience indicates that with a 100-fold production, the production cost is about half. If partial series production can be organized, cost reduction for that component is possible.

6. FIELD-TESTING AND MONITORING

Clients need to be satisfied with the performance of the product, whether it saves fuel or increases comfort. Monitoring by the client itself, feedback to the MSE and the DO are essential elements in the development cycle of a product. In some cases, small modifications will be necessary to overcome slight inconveniences. In reality, the development cycle is a continuing process that does not have a defined end. This means that the DO must have a budget for such action research and product development. After working for some time with the MSE association, these should take over the action research.



The product improvement after first installation and monitoring is important. Sometimes installation details have to be adapted; this is especially the case with in-house installations as houses are different inside and clients have different ideas.



When an Improved Cooking Stove (ICS) was introduced, the pot skirt for the wok was also made from galvanised sheet steel, having a good presentation.

One medical person observed that the top part of the skirt could get over heated, emitting some zinc vapours.

Although the possible health risk from the zinc vapours is miniscule as compared to the benefits of lesser smoke or firewood used, heat-resistant paint was introduced based on this observation to avoid any negative comments.

A future efficiency improvement would be a ceramic liner for the burning chamber; the technology still needs to be forthcoming from local clay brick manufacturers.

Preferably, the clients participating in the workshop should also be the ones monitoring and field-testing the new products. This way, they are more inclined to assist in further improving the product together with the local artisan. Some of the testing on thermal insulation will take an entire winter season. Ideally, another workshop can be arranged a year later to obtain information on what they found most useful or most difficult. Inviting newsgagents would provide free advertisement.

7. WOMEN AND CFPD

Unemployment of men is as serious a problem as the lack of development of women. In many societies, employment is seen as a need for men rather than for women, with the result that women become second rate as compared with men. On the other hand, the women raise and educate the children who form the society of tomorrow.

In the area of environmental and energy management, women play several crucial roles. They often collect the fuel, do the cooking and keep the house warm, together being responsible for 95-100% of the energy consumption. The women will be the first to benefit from lower energy needs and time saved. They can use that saved time to make products that again save more time or improve their lives in other ways and generate income.¹⁷

In the area of energy-saving products or house improvements, women will have the best affinity with activities that are linked to their reproductive tasks, including food preparation and clothing. Some of these activities can be organised from home and only need occasional supply of source materials from local artisans or traders. The following are possible:

- Make heat retention bags (HRB) for further energy saving in the cooking process. These can be made from several types of materials.
- Market heat retention bags with recipe booklets.
- Provide cooking classes using the solar box cooker, pressure cooker and HRB.
- Make roll curtains for improving thermal insulation of windows.
- Market and home install roll curtains.
- Produce insulated foot warmers and market them.
- Solar drying of fruit and vegetables.
- Food processing, such as making oil or preserves.
- Central bakery for chapatti and bread products.
- Organisation, administration and support of S&LS.
- Awareness raising and promotion of energy saving.
- Marketing of ICS and improved baking equipment.



HRB made from cloth and shredded EPS; keeps most food cooking for 2 hours¹⁸

In societies where commercial work of women is uncommon, the DO needs to actively identify economically productive work for women that allow income generation and increased communication within their society.

¹⁷ In many societies women are also active in house construction and varieties of construction jobs.

¹⁸ Photo of the Wonderbag, a product of Natural Balance in South Africa. With a thickness of about 5 cm EPS pellets, a 2.5 kg pot with food taken directly from the stove will stay more than two hours above the 70°C; thus continue to cook the food during that period.

8. MARKETING THE PRODUCTS

DOs and MSEs often do not realize the importance of marketing their products. Most local artisans work and wait in their workshop for villagers who happen to come along their place of business. Often they depend on personal relationships with the villagers.

One carpenter commented that he had no time to market his products because then nobody would produce the cabinets. It was suggested that possibly his unemployed nephew could do the marketing. This was a new idea to him. He did realise that he spends about 1/4 of his time attending to (non-buying) customers who want to look at the products. Separating workshop and sales (front and back of the place) was also a new idea.

Most clients only buy if they have seen the product; this also applies for villagers who heard that another villager saved 50% of fuel during the winter because of a new product. An area in the village must be available for looking at the product. Not all societies allow strangers in their house to look at a certain product. In small communities, a model house can do, but in larger communities, public spaces like schools are better.



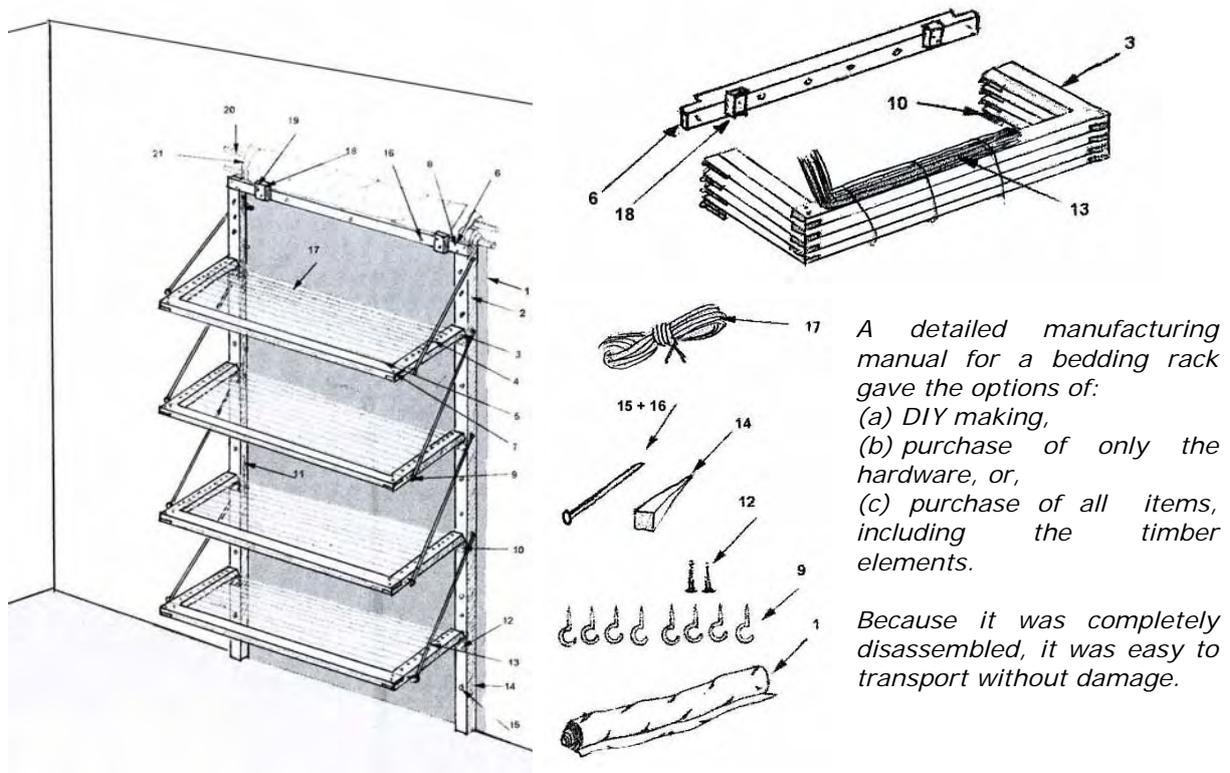
Thermal insulation applied in classrooms provided demonstration to many schoolchildren who will tell about it at home. In addition, a comparison can be made with non-insulated classrooms. Posters with explanations were fitted on the wall and one area was kept open to allow visitors to look into the construction. Special visiting hours for the parents were organised.

Leaflets explaining the basics and factsheets explaining the details, advantages AND disadvantages are necessary elements in the information and awareness raising.¹⁹ Radio messages and street posters are other media to create awareness of new products; how they work and what the benefits are.

Retail shops or traders who do not manufacture the products themselves may have interest in selling the products for a small commission. In reality, it will save the artisan who produces the article time in entertaining prospective clients. The retail shop, such as a hardware store or building material outlet, may have some stake in promoting the product because he supplies the building materials.

¹⁹ When products are only advertised to have advantages, they become unbelievable. ALL products have both some advantages AND disadvantages. Usually the cost price is a disadvantage, but when people understand the disadvantages, they may think of ways to overcome them.

Some products can be made available as DIY items, having installation manuals, especially in house improvements. The DIY market in developed countries is very large and a major resource for the lower income population to obtain affordable house improvements. Each major chain of DIY shops not only has the necessary tools for hire, but dozens of very precise installation manuals for their clients as well.²⁰



One shopkeeper selling building materials and readymade windows was interested to sell double glass insulation windows, but did not know who manufactured these.

If supplied with a 1 m² real size and worked open section (model) of the construction of a roof or wall insulation, he would gladly exhibit this model in his shop because it would lead to the sale of various building materials to DIY clients, including carpenters.



8.1. Mini-Shows or Road Shows

Mini-shows are an excellent way to present new products and explain the functions of the new products. Both large- and small-scale models can be brought to the mini-show, but the real-size model, even if it is only a section (from roof or window), will provide the best information to the interested (potential) clients.²¹

²⁰ Although the details of the products are different for each country, and pictures of houses can be substantially different, the manner in which the DIY manuals are presented can serve as examples for own presentation.

²¹ A special paper has been prepared on the organization of road shows, outlining the details.

Since many house improvement productions need to be applied locally by village artisans or manufactured locally by for example stove makers, local MSE should participate in the show. At the show, manufacturing and DIY manuals should be available for sale, as well as factsheets on each individual product and general information leaflets on why a certain range of products would be beneficial for each family or the village as a whole. Local artisans should have order forms available or sample contract agreements providing detailed information about what they can supply and under what conditions, such as material supply, transport, assisting labour, finance and cleaning up.

If possible, MSEs can have their own table or corner at the show. Not only will the cost of the show be reduced when more MSE participate, but the show will become more interesting for the clients when more items are presented. This means that the DO needs to assess what other MSE or partner organisations can be motivated to realize a joint show programme. In many cases, local government will be interested in being present at such shows to communicate with the population.

Although during a show public address is one of the items, the provision of documentation is essential as that documentation will be taken home and be consulted by other family members and neighbours who could not attend. After some time, these leaflets and factsheets also remind the villagers about the possibilities of a certain product. On the other hand, the main theme and objective of the show should not be lost by including too many other actors.



A road show in a remote village allowed all people to see the new items.

Timely planning and information to the public near the location of the planned show is important. This will allow them to produce and supply food and refreshments. If the DO needs to supply free food and refreshments, it would attract people, but the organisation time and cost will also increase. In some of the road shows, invited villagers and artisans received a refreshment coupon.

Timely planning involves the publicity of four items at the same time:

- ☞ What is the subject of the show?
- ☞ Where exactly will the show be held?
- ☞ What time will the show be open to the public?
- ☞ Who is invited to the show?

If any of these items is missing, it will cause undue confusion.

Drama shows, music and dance, competitions and prizes are all elements that can be included in the show to make it a lively and memorable event.²²

²² When the author came 10 years later in the same village for another project activity, some of the villagers still remembered the once held road show.

8.2. Transporting Articles or People

The DO needs to assess the possible impact and cost aspects of a road show in a distant village or organising a show in town. Economically, organising an in-house demonstration is far more cost efficient, but then fewer villagers will be reached directly.

Holding a Road Show Away from the Office	Bringing People to an Office Show
The number of people is large. Hundreds of people can attend.	The number of people is small; usually no more than a bus or a few cars.
This is a village event with a lot of impact.	This can be a fun travel for a few persons.
Everybody can attend, also local women together with family who otherwise may not be allowed to go out of the village. The men commonly decide on the finances for any type of purchase.	Not everybody will be allowed to travel to another village, especially not women in some societies. House improvements are mainly women focussed, so they need to receive the information.
Transport cost to bring all the show items, tables and supplies to a village is large when the road is difficult.	Transport cost is limited to a few vehicles, as only people have to be transported.
Overnight organisation and expenses for the DO staff is necessary; not always easy in a remote village.	Overnight expenses for the visitors can be paid for by the DO or themselves, depending on whether the visitors have acquaintances or relatives to stay with.
Long-term preparation needed in planning, advertisement and arranging local artisans and other support in the village.	Short-time planning when the DO has a permanent exhibition area at the office.
Villagers use their own toilet facility before and after the show when in the village.	Small group can use the existing office toilet facilities. The location needs to be indicated upon arrival.
Loud-speaking arrangements need to be made for addressing large groups.	No loudspeakers needed.
Repeated video presentations can be made, but need a special darkened room.	One video or PowerPoint presentation can be made for small group.
Food and refreshment supplies can be organised at the village level; self-financing.	Refreshments and lunch supplied by the DO.



Inviting selected villagers per bus to a fixed show position at the DO premises can assure the presence of more influential people and women heads of households.

Bulky elements such as real-size models do not have to be transported.

People seldom buy expensive items during shows, as they have to consider the options together with other family members.

ANNEXE I INTERVIEWING TECHNIQUES

For the development of ideas and assessing what the potential clients need, interviews with these clients and MSEs are required. Doing these interviews in a clever way stimulates the clients to provide clues and ideas the project needs. This is done by semi-structured interviews.

Semi-structured interview have predetermined topics. New questions or insights will arise as a result of the discussions. The interviewer should have a checklist, but needs to be flexible in the approach when interesting information arises.

Making the clients at ease, perceptive listening and careful observation are essential elements of the interview. Body language can indicate whether or not a person is uneasy or wants to tell something. Probing questions like "why?", "what do you think?", "give an example" and "anything else?" allows the client to elaborate the answers. Having sufficient time and drinking a cup of tea when offered by the prospective clients will relax the atmosphere.

We arrived in a house as dark as a cave, full of smoke from a rusty stove. There was an open hole in the roof. Everything was black with soot and our feet became numb because of the freezing cold floor. The water was 1 km walking distance away and for collecting firewood, they had to walk a whole day.

We asked: "What then is your main problem?"



The following basic principles should be followed:

- Use a checklist or interview guide - know what areas you wish to discuss before starting the conversation, explain why you are conducting the fieldwork (a brochure or factsheet describing the programme will be helpful).²³
- Ask whether it is OK to enter the house or see the other rooms and toilet.
- If the husband or other family members are around, invite them to join the discussion.
- Be sensitive and respectful to everyone involved. Make sure the interview situation is comfortable. Sit on the same level or join in with a task that someone is doing.
- Listen carefully and be prepared to learn, not teach.
- Ask open-ended questions using: Who? What? Why? Where? When? and How?
- Probe responses carefully to learn more.
- Judge responses (fact, opinion or rumour).
- Record responses and observations carefully, also who says what.
- Make sure the women are able to express their opinion.
- Use a small notebook, not a large clipboard and very visible recording equipment.
- Make notes shortly after the interview and discuss the responses with colleagues to draw the most important lessons from the interview.

"Although the questionnaire was primarily designed for women, the men of the house were often present during the interview and added their perspective. Efforts were made to judge the true picture and get the true answers by adopting an informal approach towards the women and by ensuring the presence of female BACIP staff during the interviews. The experience of BACIP staff and the village resource persons added to the reliability of the results."²⁴

²³ Experience interviewers will have that checklist in their head as paper forms and taking notes may appear threatening to the clients. Recording shortly after the interview is important.

²⁴ Text from the AKPBS,P Building and Construction Improvement Project document; "BACIP from a Gender Perspective" (2001, by author).

In one group interview, the men proclaimed that they were responsible for the household, the children, the cooking, etc. Hence, it was not necessary to consult the women at all. After prodding for a while, they admitted that they never had cooked in their life, never fed the children, nor did any practical household task.

BACIP agreed that they were "responsible", but that the success of every improvement depended on real testing and experiencing by the women, reason why BACIP needs to discuss the improvements and their possibilities with the users, the women.

Questions should be phrased in such a way so that they are not leading or ambiguous, which might produce distorted or unclear answer. Here are some examples of how **NOT** to ask questions:

- ❑ *Is it true that it is difficult to purchase charcoal in this town?* (leading). Better to ask what is being paid for the fuel in this village and for which amount.
- ❑ *How do you get your customers?* (ambiguous). Better to ask what type of advertisement the artisan does to get customers.
- ❑ *Would you not prefer to buy a better stove instead of insulation?* (leading). The client would most likely not know why there is a difference, since most people think first of the stove as a heat source; hence, that needs improvement.
- ❑ *What do you do as head of household?* (ambiguous, vague). Better to ask specific questions about water use, warm or cold, quantity and for what purpose.
- ❑ *Is this floor not very cold in the winter?* (leading). Ask where they sleep and how they feel at night. Ask some indirect questions about moist bedding or rheumatism.
- ❑ *Would you not be better off if you had double windows?* (leading). Better to ask if they know someone in the village who has double glass windows.

Leading questions tend to make respondents answer with a Yes or No. Open-ended questions will generate more explanation. A checklist will probably change after some interviews, reflecting what has been learned about the clients and/or their problems.

Start an interview with an MSE with questions about their main product at the moment. This will provide information about the business and operation. Asking what they did in the past allows the MSE to express achievements and historical information. Ask if the MSE has any constraints for his/her future plans, which are important aspects to note.

ANNEXE II EXAMPLE OF THE RHW

The Roof Hatch Window (RHW) was one of the first products of the Building and Construction Improvement Programme (BACIP) in Pakistan developed according to the CFPD principle.

Design ONE

The principle of a RHW is not at all new and is a logic solution to the existing heat loss through the open hole in the roof.

By installing the RHW in combination with a chimney on the stove, energy savings of up to 50% were recorded the first winter.

Although it was simple to make that technical conclusion, it required seeing various houses from inside and studying the roof construction in order to assess what would be technically possible and what size as the roof hole was the only source of light into the house. The RHW needed to be waterproof and be easy to construct.

It was necessary to discuss with the house owner whether we could use his house as a demonstration site for other villagers to visit and look at the RHW.

The first RHW models could be fully opened, as required by the clients for ventilation during the summer. In the vertical rear side, a wooden ventilator was made which could be easily opened from below by means of a string.

For the very cold areas, an additional metal cover was attached, but to close this for the night and open it again in the morning, people had to climb the roof, which they did not like.

However, because the youth in the villages commonly played cricket and threw stones at birds, several glass sheets broke and fell down onto the stove. In addition, strong wind gusts occurred in certain valleys and the glass windows were too vulnerable.



Design TWO

The first improvement was a laminated glass sheet (3-1-3), which could be manufactured in the capital. A standard size was chosen and the BACIP project bought these sheets in large quantities, supplying them in their packing crates to the carpenters.

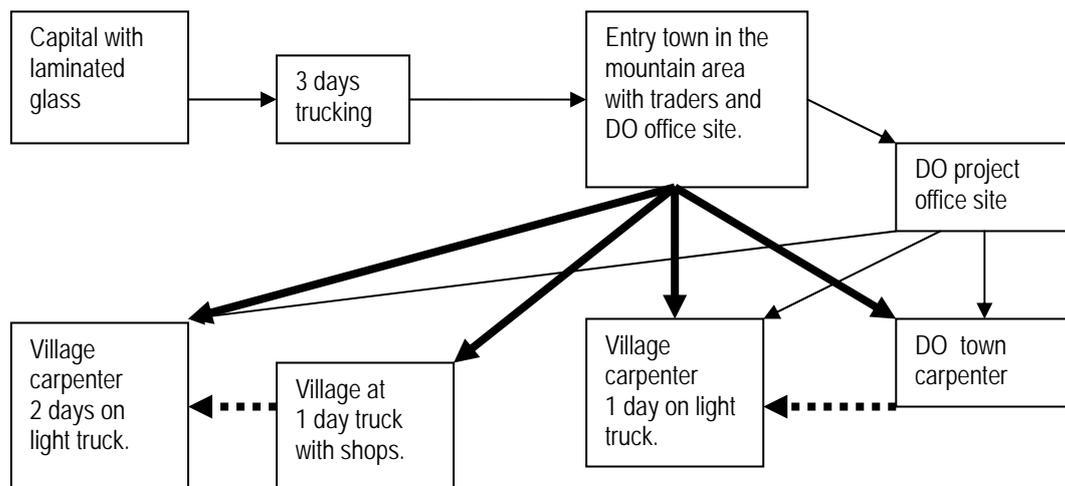
At the same time, two double glass side windows were made to increase the light intake of the standard-size design.

The laminated glass sheet could be pulled out for the summer period and safely stored away.

Another optional attachment was a fly screen which could be inserted under the ventilation opening.



Although this was the right development method under the CFPD, the project continued to buy and supply the laminated glass for many years to the village carpenters, without organising a trader in town to supply these or an association of carpenters to buy the glass (thick lines in flowchart below). By not stimulating the shifting of the ordering process, the project remained with the administrative cost of ordering, but more important, with the transport to the village carpenters and in fact a subsidy.²⁵



Two models were possible for change: (1) to negotiate that a town trader buys the glass in the capital, which was easy because the market existed, or (2) organise a carpenter association to do the buying. Eventually the carpenters association would be the better option as they could also buy in bulk such items as the hinges, locks, paint and at a later stage pre-planned timber for faster production.

²⁵ As a working relation existed between the BACIP project and the glass supplier, these purchase costs were low. The cost of transporting the glass sheets was much higher, but the DO went regularly to the same village for other purposes and did not feel the need to let go of this supply activity.

Design THREE

The DO continued to look at options to make the RHW product cheaper and commissioned a metal design in the capital. This was indeed cheaper than the wooden design, basically because the large town metalworkers were able to systemize production for mass production and provide a cost estimate for the mass production. The metal design, however, had the following disadvantages.

- ☒ The unit was as voluminous as the timber unit and would result in large transport costs for two or three days trucking. The way the transporters were loading the trucks also may have caused deformation of the units.
- ☒ The price was low because there was no galvanisation of the metal. The silver paint would not last long and the entire unit would quickly corrode.
- ☒ The metal unit defeated the purpose of better thermal insulation because metal has a very high cold transmission.
- ☒ It was not yet resolved how the unit would connect to the timber roof construction of the traditional roofs.
- ☒ It did not generate any skills or employment within the region.



Design FOUR

Although the RHW was a tremendous energy saver as compared to the open roof hole, it was still only single glass at the warmest area of the room, thus causing the largest heat loss. The cold single glass caused condensation, which dripped outside (designed to do so), but the opening to allow the condensation to flow outside caused ventilation and cold draft. The larger vertical rear ventilator could be made smaller.

Additional thermal insulation was designed with a double transparent plastic insert. This piece was made in such a way that it could be easily assembled by the owner of an existing RHW and sold separately as an optional item. In the same manner as this insert was made, a fly screen could also be made.²⁶



Centrally located carpenters having electric timber planing benches could pre-manufacture shaved and profiled timber. This profiled timber could then be supplied to the smaller, non-machine operating carpenters in the villages for faster and better quality production of timber products.

- From visiting houses where ten years ago the RHW were installed, three things could be observed:
- (1) The house owners were still happy with the firewood saving aspects resulting from the first RHW installation.
 - (2) The house owners were interested in knowing whether there were other methods to save more firewood – reason for which the DO suggested to design the new insulation insert.
 - (3) The house owners generally had not done any type of maintenance to their RHW, apart from in some cases replacing broken glass.

²⁶ See the two pictures of the DIY winter insert, under Chapter 4, paragraph VIII.



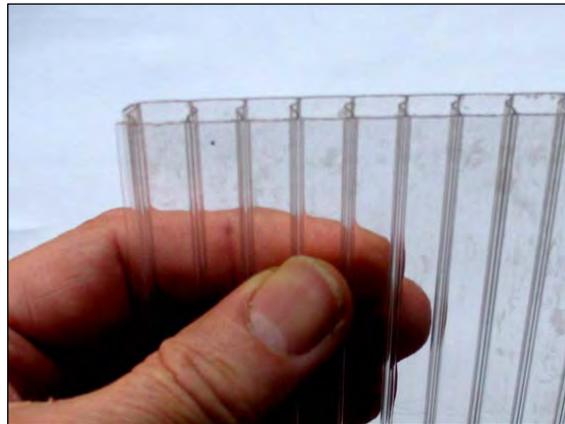
Part of the fourth design improvement, therefore, was to apply a galvanised metal sheet cover over the outside facing timbers to protect these from the high altitude strong UV solar radiation. This would require collaboration between a sheet metalworker and the carpenter in the same village. As the timber RHW were all the same size, it would be possible for one central sheet metalworker to supply the pieces in bundles to the various carpenters.

Design FIVE

As indicated in the main text of the CFPD, the design evolution seldom ends and after some time new improvements are possible. The introduction of 6 mm or 10 mm hollow, clear polycarbonate sheets will further improve thermal insulation.

Advantages: Lower cost per sheet than laminated glass (3-1-3); lower transportation cost (lighter) and lower breaking risk; high sunlight transmission; a single 6 mm sheet has 50% higher insulation value than single glass; can be sawn locally into different dimensions; side windows can be made easily.

Disadvantages: Sold in large lengths (4 m); needs to be cut in half when small vehicles are used; resistance to UV light differs with brand name; plastic is very static and will attract dust.



Since it has been determined that the Polycarbonate sheets are available, this design option should be produced for demonstration.

Design SIX

Plastic window frames are becoming more available in many countries. With the accompanying tools, many different sizes of windows can be manufactured, including with double glass.

One of the biggest advantages of these windows is it that they are better insulating than the timber designs, especially when made with double glass. Another advantage is that the white PVC does not require painting maintenance and looks very good.

The disadvantages are that the material is bulky, single plain glass needs smaller windows, and the construction in its assembled form is very heavy. Because of the last aspect, the design is also very vulnerable during transport and installation. Since all materials need to be imported into the region, the amount of employment is less than with timber windows.

Comparing the advantages with the disadvantages, and when some of the disadvantages can be resolved by adapting the design and working method, it is on the whole a very good design.



The above two roof windows were manufactured by a town-based plastic window maker without any cost or time expenses to the DO. This window maker saw the potential of the better insulated RHW, had the materials in house and took the initiative to produce the new product. This is an example of User-Led Innovation (ULI).

Options for development:

- A. Use Polycarbonate instead of glass, thus lowering substantially the cost, reducing the weight, increasing the insulation value and reducing breakage.
- B. Make the lower vertical windows larger and one as ventilator. This is simpler than making the inclined top windows.
- C. Make the design in flat pieces so they can be assembled on the construction site, reducing the vulnerability and transport costs.
- D. Design a remote string control to the ventilator window so it can be operated from below.
